

Standardization of Real Property Rights and Public Regulations

The Legal Cadastral Domain Model

JESPER M. PAASCH



**KTH Architecture and
the Built Environment**

Doctoral Thesis in Real Estate Planning
Stockholm, Sweden 2012



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Real Estate Planning and Land Law
Department of Real Estate and Construction Management
School of Architecture and the Built Environment
Royal Institute of Technology (KTH)
SE-100 44 Stockholm
Sweden

Abstract

The objective of this thesis is to develop a conceptual model for classification of real property rights and public regulations. The model is called the Legal Cadastral Domain Model.

The model is intended to be a terminological framework for cross-border exchange of cadastral information. Parties exchanging cadastral information via the model do not require detailed knowledge of the legal system in which the right or regulation is created.

The model is based on the principle that real property rights and public regulations influence real property ownership by being either beneficial or encumbering for the real property owner.

The theoretical departure of the research presented in this thesis is in comparative legal theory and terminology. Real property rights and public regulations are important parts of real property legislation as they describe and secure the use and other exploitation of land, water and air.

The research is conducted through studies in real property legislation and associated literature. The model has been developed through case studies on real property rights in Portugal, Germany, Ireland, the Netherlands and Sweden and public regulations in Portugal and Sweden.

The generated results show that it seems possible to describe real property rights and public regulations regardless of their legal origin, at least in Western legal systems.

The thesis also includes a discussion of terminological aspects concerning definitions of three-dimensional (3D) real property.

The thesis consists of a summary and 6 papers.

Keywords: Cadastral domain, standardization, real property, real property rights, public regulations, real property ownership, land administration, modelling, terminology, comparative law.

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I am also indebted to the following for either co-authoring two of the articles presented in this thesis and/or answering questions in regard to my case studies or otherwise being helpful: Mr. Fergus Hayden at the Irish Land Registry in Dublin, prof. adjunto João P. Hespanha at Technology and Management Polytechnic School in Águeda, Portugal, prof., Dr. Manfred Holler at University of Hamburg, Germany, Dr. Mónica Jardim at University at Coimbra, Portugal, Dr. Barbro Julstad at Lantmäteriet, Dr. Jenny Paulsson at KTH, prof. Dr. Hendrik Ploeger at Delft University of Technology, the Netherlands, Dr. Markus Seifert at Land of Bavaria Agency for Surveying and Geographic Information in Munich, Germany and prof. Dr. Jaap Zevenbergen at University of Twente, the Netherlands.

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Last, but certainly not least, I want to express my sincere thanks and gratitude to my wife Anna for her endless patience, never ending encouragement and always constructive comments.

Gävle, May 2012

Jesper Mayntz Paasch

Content of thesis

Introduction

Summary of thesis

Paper 1

Paasch, J. M. (2005). Legal Cadastral Domain Model - An object-orientated approach. In *Nordic Journal of Surveying and Real Estate Research*, volume 2, number 1, 2005 (pp. 117-136).

Paper 2

Paasch, J. M. (2008). Standardization within the Legal Domain: A Terminological Approach. In Doganoglu, T., Holler, M. J. and Tiedeman, J. (eds.). *EURAS Yearbook of Standardization*, volume 6, 2008 (pp. 105-130). On-line publication.

Paper 3

Hespanha, J., Jardim, M., Paasch, J. and Zevenbergen, J. (2009). Modelling Legal and Administrative Cadastral Domain: Implementing into the Portuguese Legal Framework. In *Journal of Comparative Law*, volume 4, number 1, 2009 (pp. 140-169).

Paper 4

Paasch, J. M. (2011). *Classification of Real Property Rights - A Comparative Study of Real Property Rights in Germany, Ireland, the Netherlands and Sweden*. KTH Royal Institute of Technology. Stockholm, Sweden. TRITA-FOB Report 2011:1.

Paper 5

Paasch, J. M. and Paulsson, J. (2011). Terminological Aspects Concerning Three-dimensional Real Property. In *Nordic Journal of Surveying and Real Estate Research*, volume 8, number 1, 2011 (pp. 81-97).

Paper 6

Paasch, J. M. (2012). Modelling Public Regulations – A Theoretical Approach. Submitted for peer-review to *Nordic Journal of Surveying and Real Estate Research* in May 2012.

Introduction

The results presented in this thesis are a contribution to the ongoing research of the cadastral domain.¹ The aim of the thesis is to develop a conceptual model describing a standardized, terminological framework for classification of real property rights and public regulations influencing the owner's use of real property, the *Legal Cadastral Domain Model*.

The concept of standardization traditionally belonged to the technical/industrial manufacturing industry, securing the usability of technical products, specifications and measurements.² The concept has however over the years developed into other fields like organisation and information management.³ The aim of a standard is to create a framework for handling and exchange of goods, information and services through a common interface.

The theoretical departure of the research presented in this thesis is in comparative legal theory and terminology. Real property rights and public regulations are important parts of real property legislation as they describe and secure the use and other exploitation of land, water and air. A standardized classification would further cross-border exchange of information regarding these legal instruments, thus making international comparison easier.

Any comparison requires (some degree of) standardized terminology; otherwise the receiver is not capable of understanding the message. It is, apart from language barriers and the use of sometimes different terminology, difficult to exchange information on the content of national cadastres, since national cadastral domains are part of national legislation and may be deeply rooted in a country's historical and cultural traditions.

¹ The term cadastral domain covers a wide range of land management issues like the registration of real property rights, fiscal rights and other issues influencing the use, management and exploitation of land, water and air.

² The concept of standardization is old. Examples of e.g. standardized weights and goods are known from antiquity. Biblical and ancient Indian texts state the value of correct measurements. It is e.g. mentioned in an Indian text from about 400 BC that '[...] the king should inspect the weights and measures and have them stamped every six month and punish offenders and cheats'. Cited in Spivak and Brenner (2001, pp. 8-9).

³ In total, more than 19.000 international standards exist according to ISO, the International Organization for Standardization. Examples are the international standards for quality management – ISO 9000, and environmental management – ISO 14000. See www.iso.org.

Parties exchanging cadastral information via the Legal Cadastral Domain Model do not require detailed knowledge of the legal system in which the right or regulation is created. They can receive information about what type of right or regulation which influences real property ownership, which in this thesis is seen as the central right to real property.

Other aspects of cadastral research such as registration, visualization, taxation, etc. are equally important for the development of the cadastral domain, but without a legal basis there would be no rights or regulations to exchange information about.

I hope my research will contribute to an increased awareness of the importance of legislation and terminology in cadastral research.

Summary of thesis

Jesper M. Paasch

Table of content of summary

1 The empirical setting	12
2 Research structure	13
3 Research methodology	16
<i>Paper 1</i>	16
<i>Paper 2</i>	16
<i>Paper 3</i>	16
<i>Paper 4</i>	17
<i>Paper 5</i>	18
<i>Paper 6</i>	19
4 Presentation of papers	21
<i>Paper 1</i>	21
<i>Paper 2</i>	22
<i>Paper 3</i>	22
<i>Paper 4</i>	23
<i>Paper 5</i>	23
<i>Paper 6</i>	24
5 Conclusions	24
6 Discussion	27
7 Future research	28
8 Svensk sammanfattning (Swedish summary)	29
9 References	30
Appendix 1	34

1 The empirical setting

The cadastral community has during the last decades of the 20th century been producing digital cadastral data, replacing analogue records to further smoother and more cost effective land administration.⁴

The next phase is the exchange of digital cadastral information among national and international users. In the first decade of the 21st century a number of scientific publications, conferences, projects and other initiatives have shown an increased awareness towards the registration and exchange of cadastral data.

Examples are the annual FIG⁵ conferences, the Cadastral Data Modelling workshop in 2003, the Standardization of the Cadastral Domain conference in 2004, and the 1st and 2nd international workshops on three-dimensional (3D) real property in 2001 and 2011.⁶ Other initiatives are e.g. the European EULIS co-operation, the European COST research co-operation, the UNECE guidelines on real property identifiers, the European INSPIRE directive, the Core Cadastral Domain Model and the Land Administration Domain Model:

The EULIS (European Land Information Service) co-operation provide a facility for accessing online and updated information on land across European borders, focusing on mortgaging and conveying of real property. The aim is to improve opportunities for pan-European activities and to compare national practices.⁷

The European Cooperation in the field of Scientific and Technical Research (COST) has researched different aspects of real property transactions. One of the experiences is that terminology plays an important role and scientific investigation within a field where terminology is confused or not comparable is extremely difficult.⁸

⁴ An early example is the Swedish Real Property Register. A report stated almost 50 years ago that the aim of digitalisation was to “be fitting the separate registers into a uniform flexible net of information systems” (SOU, 1966, p. 310).

⁵ International Federation of Surveyors.

⁶ See www.fig.net, ITC-ESRI (2003), van Oosterom et al. (2004), van Oosterom et al. (2001) and van Oosterom et al. (2011) respectively.

⁷ Ploeger and van Loenen (2004; 2005), Laarakker and Gustafsson (2004). See www.eulis.eu.

⁸ Zevenbergen, Frank and Stubkjær (2007, pp. 18-20).

Another initiative to describe and compare cadastral information is the guidelines for real property identifiers produced by the United Nations Economic Commission for Europe, UNECE.⁹ The guidelines aim at supporting effective national land administration.

The directive on Infrastructure for Spatial Information in the European Community (INSPIRE) is demanding the creation of data specifications for exchanging digital information on a large number of spatial data themes in Europe.¹⁰ One of the themes is cadastral parcels.¹¹ The directive does, however, only require geometrical, not legal, cadastral information to be exchanged, but I think the directive indicates a growing international awareness towards the exchange of cadastral information (on a European level).

The Core Cadastral Domain Model is an initiative to further international understanding and exchange of cadastral information.¹² The model aims at creating a standardized terminological framework for creating cross-border information services, where semantics have to be shared between countries in order to enable translations of real property terms. The model has been submitted to ISO (International Organization for Standardization) for being further developed into an international standard for land administration, the Land Administration Domain Model, LADM.¹³ The LADM is scheduled to become an international standard in July 2012.

A common nominator for the initiatives listed here is that they in my opinion indicate the need for standardized terminology as basis for any effective exchange of cadastral information. The research presented in this thesis is a contribution to the development of such a standardized terminological framework.

2 Research structure

The research was conducted by publishing journal articles and a report, which are summarised and discussed in this summary as paper 1-6. Paper 1, 2, 3 and 5 are articles published in peer-reviewed journals. Paper 4 is a report published at KTH. Paper 6 is an article submitted for review to a peer-reviewed journal. An overview of the research structure is shown in figure 1.

⁹ UNECE (2004).

¹⁰ INSPIRE (2007).

¹¹ INSPIRE (2010a).

¹² van Oosterom et al. (2006).

¹³ ISO (2011).

Rights and regulations can be classified according to a number of characteristics, e.g. their spatial expansion, the value or type of the land they cover, etc. However, underneath all these geometrical, financial and other attributes real property rights and public regulations are legal instruments, regulating the use of real property. I have therefore chosen to base my research on legal comparison and terminology. Bogdan¹⁴ states that any comparison must be based on common issues in the legal systems subject for comparison. Legal rules cannot be compared word by word. The contexts of the rules have to be compared, since they constitute the basis for any legal activity. Bogdan also argues that a comparison must be of a certain value and we must be cautious not to make too simple comparisons. Regardless of any method of comparison, it is not enough to merely compare legal systems.

The first phase of the research is presented in paper 1, containing an investigation of the state of the art of research in cadastral modelling in order to isolate a problem to investigate. A research hypothesis was established stating that it is possible to categorize real property rights and public regulations influencing real property ownership, regardless of their origin in different legal systems.

Paper 2 added a theoretical dimension to the descriptions of the Legal Cadastral Domain Model by giving an introduction to conceptual legal modelling and developing the models terminology.

The model was thereafter in paper 3 and 4 tested in case studies on real property rights and public regulations in national legislations. The analysis in paper 4 revealed some inconsistencies in the real property right part of the Legal Cadastral Domain Model, which is updated in the paper.

3D property was subject of a terminological study in paper 5. The analysis of the concept(s) of 3D property does not fit directly into the development of the Legal Cadastral Domain Model, but is an attempt to discuss terminology of a specialised part of the cadastral domain on an international level.

The theory building for the public regulation part in the Legal Cadastral Domain Model in paper 1 and 2 is not as developed as the real property rights part. This inconsistency has been noted in paper 6, where a theoretical approach to the development of the public regulation classes is presented. The result is an extended version of that part of the model.

¹⁴ Bogdan (2004).

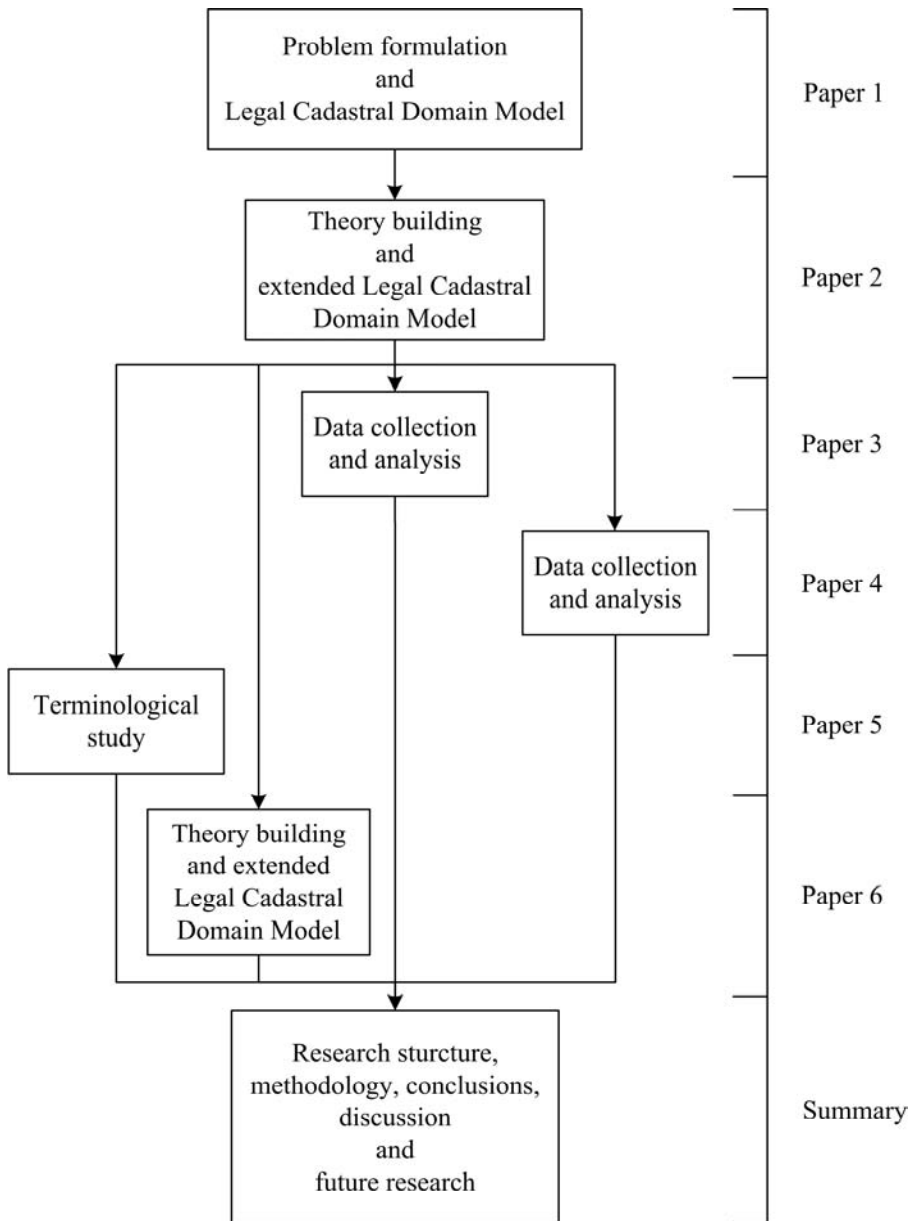


Figure 1. Research structure.

3 Research methodology

The research methodologies are described for each paper below. An overview of the design, data collection and validation methods for each paper is shown in table 1.

Paper 1

Paasch, J. M. (2005). **Legal Cadastral Domain Model - An object-orientated approach**

The research was conducted using qualitative research methods; literature studies, studies in Swedish real property legislation and supplemented with my own experience in the field of cadastral modelling, gained from participating in projects modelling Swedish real property rights and public regulations at Lantmäteriet.¹⁵ Swedish real property rights and public regulations are used to exemplify this first, preliminary version of the Legal Cadastral Domain Model.

Paper 2

Paasch, J. M. (2008). **Standardization within the Legal Domain: A Terminological Approach**

The research was conducted using a qualitative research method; literature survey in the fields of comparative law, legal history and terminology functioned as theoretical departure for the paper. International standards on terminology were used as basis for the development of the terminology of the Legal Cadastral Domain Model. The result is an expanded research hypothesis containing the characteristics, definitions, etc. for the model.

Paper 3

Hespanha, J., Jardim, M., Paasch, J. and Zevenbergen, J., (2009). **Modelling Legal and Administrative Cadastral Domain: Implementing into the Portuguese Legal Framework**

The article is co-authored with prof. adjunto J. Hespanha, Dr. M. Jardim and prof. Dr. J. Zevenbergen. Prof. Hespanha took the initiative to the article by approaching me after my presentation of my initial theories at the Standardi-

¹⁵ Paasch (2004a; 2004b).

zation in the Cadastral Domain Workshop in 2004.¹⁶

The research was conducted using a triangulation of qualitative research methods; research in legislation, literature research and discussions among the co-authors. Studies in Portuguese legislation and associated (Portuguese language) literature were conducted by prof. Hespanha and Dr. Jardim. Prof. Zevenbergen and I contributed with the application of our respective classification models and theoretical input on cadastral modelling.

An early draft version of the Land Administration Domain Model, LADM,¹⁷ was used as a conceptual base for the study.

All authors participated in the discussions, analysis and formulation of the results. Communication was done by e-mail. The participation of four authors is to be seen as both expert interviews and validation, since each author contributed to the result by applying his/her special knowledge and by participating in the discussions, analysis and formulation of the results.

Paper 4

Paasch, J. M. (2011). Classification of real property rights - A Comparative Study of Real Property Rights in Germany, Ireland, the Netherlands and Sweden

The research was conducted using a triangulation of qualitative research methods; research in the selected countries legislations supplemented with literature research and interviews with national experts.

The investigated legislations are all European, but have nonetheless been judged as being suitable as input for a first validation of the Legal Model. The reason for choosing European legislations is that much non-European legislation historically is based on or influenced by European legislations, which principles spread to other parts of the world due to e.g. the European colonisation initiatives in the past.¹⁸

The legislations were studied in their national languages, except Dutch, where English translations were used, when available. The interviews with the national experts functioned as quality assurance to verify my understanding of the legislation and associated literature. A problem when conducting

¹⁶ Paasch (2004c).

¹⁷ ISO (2008).

¹⁸ Zweigert and Kötz (1998).

expert interviews is to identify the “right” experts.¹⁹ The experts were chosen based on their expertise in the field of real property rights. They were either known to me through my international work at Lantmäteriet, recommended by my supervisors or Lantmäteriet, or identified by approaching public agencies in the studied countries.

The interviewees received information about my research before the interviews. The interviews were conducted in person or by e-mail. The interviews with the German experts were conducted by e-mail. The Irish expert was interviewed during a study visit in Dublin in 2009. The Dutch experts were interviewed during a study visit in Delft, which resulted in a report.²⁰ The report served as a basis for the Dutch case study. The Swedish expert was interviewed in person. All findings were followed up and validated through either extra personal meetings and/or e-mail communication.

I did not find it necessary to ask the experts to fill in questionnaires, but chose to use a direct interview approach. A questionnaire may limit the answers to the capacity of the interviewer, thus risking to “miss” important information otherwise provided by the expert. The national experts reviewed a draft of the parts of paper 4 containing their input before publication and/or were asked to confirm my interpretation of their answers by e-mail.

Paper 5

Paasch, J. M. and Paulsson, J. (2011). **Terminological Aspects Concerning Three-dimensional Real Property**

The article is co-authored with Dr. Jenny Paulsson.

The research is conducted using qualitative research methods; literature research and discussions among the co-authors. The co-operation of two authors is to be seen as both expert interviews and validation, since each author contributed to the result and participated in the discussions, analysis and formulation of the results by applying their special knowledge.

¹⁹ Flick (1998).

²⁰ Paasch (2005).

Paper 6

Paasch, J. M. (2012). *Modelling of Public Regulations. A Theoretical Approach*

The research is conducted using qualitative research methods; literature studies on a theoretical approach to analyse the basic functions of real property ownership and public regulations.

The use of Swedish public regulations as examples is not to be seen as a case study, but as a mean to exemplify the presented theory of the still preliminary version of this part of the Legal Cadastral Domain Model.

The model has to be subject for further analysis in different legal systems, which is outside the scope of this thesis.

Table 1. Design, data collection and validation methods used in paper 1-6.

Paper	Design	Data collection	Validation method
Paper 1	Qualitative	National legislation Literature research Author's experience	Literature comparison
Paper 2	Qualitative	Literature research	Literature comparison
Paper 3	Qualitative	Case study National legislation Literature research Input from co-authors	Literature comparison Discussions among co-authors
Paper 4	Qualitative	Case studies National legislation Literature research Expert interviews	Literature comparison Expert interviews
Paper 5	Qualitative	Literature research Input from co-authors	Literature comparison Discussions among co-authors
Paper 6	Qualitative	Literature research National legislation	Literature comparison

4 Presentation of papers

Paper 1

Paasch, J. M. (2005). **Legal Cadastral Domain Model - An object-orientated approach**

The article is published in *Nordic Journal of Surveying and Real Estate Research*. 2005, volume 2, number 1, pp. 117-136.

The scope is to develop (a preliminary version of) the Legal Cadastral Domain Model.

The model serves as a hypothesis, stating that it is possible to classify real property rights and public regulations regardless of their origin in different legal systems. Such classification would further an international comparison and exchange of cadastral information. The model is general and focuses on relations of real property rights and public regulations with the right of ownership. The right of ownership is in the hypothesis seen as the central right, being benefitted or restricted by other rights.

The development of the model begins with an introduction to cadastral modelling and continues with the construction of a preliminary model. Real property rights and regulations can be either beneficial or limiting to the real property owners' use of his²¹ property. The model is exemplified with Swedish real property rights and public restrictions regulating ownership. The Legal Cadastral Domain Model consists of two parts: A diagram showing the connections between the included categories and textual descriptions defining the content of the categories. The diagram is developed in this paper and based on a preliminary analysis of Swedish real property rights and public regulations. The definitions and descriptions are developed in article 2.

²¹ "His"/"he" is hereafter used as a synonym for "her"/"she" throughout this summary.

Paper 2

Paasch, J. M. (2008). *Standardization within the Legal Domain: A Terminological Approach*

The article is published in Doganoglu, T., Holler, M. J. and Tiedeman, J. (eds.) *EURAS Yearbook of Standardization*. 2008, volume 6, pp. 105-130. On-line publication.

The scope is to develop the terminology for the Legal Cadastral Domain Model presented in paper 1.

The article starts with an account on historical initiatives aiming at introducing standardized terminological frameworks to legal domain. The article then presents a terminological approach for describing and defining objects. The focus is then shifted towards the development of a legal terminology for the Legal Cadastral Domain Model.

The intention is that the model's terminological framework does not interfere with the different legal systems in existence, but create a standardized terminology for classification of real property rights and public regulations.

Paper 3

Hespanha, J., Jardim, M., Paasch, J. and Zevenbergen, J., (2009). *Modelling Legal and Administrative Cadastral Domain: Implementing into the Portuguese Legal Framework*

The article is published in *Journal of Comparative Law*. 2009, vol. 4, issue 1, pp. 140-169.

The scope is to compare the Legal Cadastral Domain Model with a model published by prof. Zevenbergen.²² Both models were applied on the Portuguese cadastral domain legislation.

The research identifies some differences between models. The article states that “[t]he main difference between the Paasch and Zevenbergen classifications of real rights relate to the legal doctrinal base. Zevenbergen's classification is built on the tradition of civil codes throughout Western and Southern Europe rooted in Roman law. Paasch's classification is more functional and should be able to fit the set of rights, restrictions and responsibilities regar-

²² Zevenbergen (2004).

ding land in any legal system of the world, but in a way that challenges the average expert of the legal system through the use of unfamiliar “neutral” terminology. In the Portuguese implementation presented here, Zevenbergen’s classification fitted better, but for a generic LADM the classification by Paasch should be more appropriate.”²³

The article is the result of discussions among the co-authors and e.g. “the class diagram in Figure 2 was obtained after lengthy discussions between the co-authors and should be regarded as a best fit and not a unanimously agreed result.”²⁴

Paper 4

Paasch, J. M. (2011). **Classification of Real Property Rights - A Comparative Study of Real Property Rights in Germany, Ireland, the Netherlands and Sweden**

The study is published as a report at KTH. TRITA-FOB Report 2011:1.

The scope is through case studies on real property rights in Germany, Ireland, the Netherlands and Sweden to test whether it is possible to classify national rights according to the Legal Cadastral Domain Model and thereby confirm, reject or further develop the model.

The case studies resulted in minor modifications to make the model capable of describing all investigated rights in the four countries. The case studies also showed that some terms used in the model are not consistent with their general (English) use in the cadastral domain. The report also proposes some changes in the terminology to make the model more clear and accessible.

Paper 5

Paasch, J. M. and Paulsson, J. (2011). **Terminological Aspects Concerning Three-dimensional Real Property**

The article is published in *Nordic Journal of Surveying and Real Estate Research*. 2011, volume 8, number 1, pp. 81-97.

The scope is to discuss terminological aspects concerning definitions of 3D

²³ Paper 3 in this thesis (pp. 168-169).

²⁴ Paper 3 in this thesis (p. 168).

real property. The selection of 3D definitions is based on Dr. Paulsson's research on 3D property rights.

The paper does not present a solution of how to develop and maintain a 3D terminology, but discusses existing definitions and point at the terminological aspects of creating a 3D real property definition. The paper highlight an existing definition stating that 3D property is legally delimited both vertically and horizontally, i.e. focussing on the legal aspects of real property. The paper is an input for further research regarding the nature and structures of 3D property.

Paper 6

Paasch, J. M. (2012). **Modelling of Public Regulations. A Theoretical Approach**

The article has been submitted for peer-review to *Nordic Journal of Surveying and Real Estate Research* in May this year.

The scope is to develop the public regulation part of the Legal Cadastral Domain Model presented in paper 1 and 2. The article analyses the concepts of regulations according to how they regulate the use of land and influence real property ownership.

The result is a more detailed version of the public regulations part of the model, classifying regulations into prohibitions, obligations or advantages influencing the ownership right to real property.

5 Conclusions

The research presented in paper 1, 2, 3, 4 and 6 in this thesis show the development of the Legal Cadastral Domain Model.

History has shown that earlier attempts have been made to describe the legal domain. These attempts have failed due to too ambitious plans to describe "everything".²⁵ The research presented in this thesis show that it is seems possible to describe a limited part of the legal domain and create a standardized, terminological framework for exchange of real property rights and public regulations regardless of the legal systems they are created in.

²⁵ See paper 2 in this thesis for references.

Paper 3 states that the model may be difficult to access due to its use of an unfamiliar, neutral terminology not based on any legal system. It is however concluded that the model is suitable for a generic classification of real property rights and public regulations.

The model is further developed in paper 4 and show that the model seems to be suitable for classifying real property rights. At least rights and restrictions in western legal systems which were subject for the case studies in paper 3 and 4. The model did however have to be slightly modified to encompass all encountered real property rights in the four analysed legislations.

Paper 5 does not directly contribute to the development of the Legal Cadastral Domain Model, but discusses existing definitions and point at the terminological aspects of creating a 3D real property definition. The paper however contributes indirectly to the development of the model by illustrating the importance of terminology in legal, cadastral research.

The public regulation part of the Legal Cadastral Domain Model has been further developed in paper 6. The part is however only based on Swedish legislations and has to be regarded as a preliminary model in need of further testing in other legal systems.

An important aspect of the Legal Cadastral Domain Model is the attempt to abolish specific terms rooted in a nation's legal tradition when communicating internationally. They have no place in a standardized legal model functioning as a terminological framework and system for classification. However, the model does not recommend any change of national terminology. National terms should remain in use in national legislations. This research does not indicate otherwise. The proposed model is not a judgement against other legal classifications such as Common Law and Civil Law, but an attempt to further the international exchange of information belonging to the cadastral domain.

The result of my research is the updated Legal Cadastral Domain Model shown in figure 2. The definitions of the classes are listed in appendix 1.

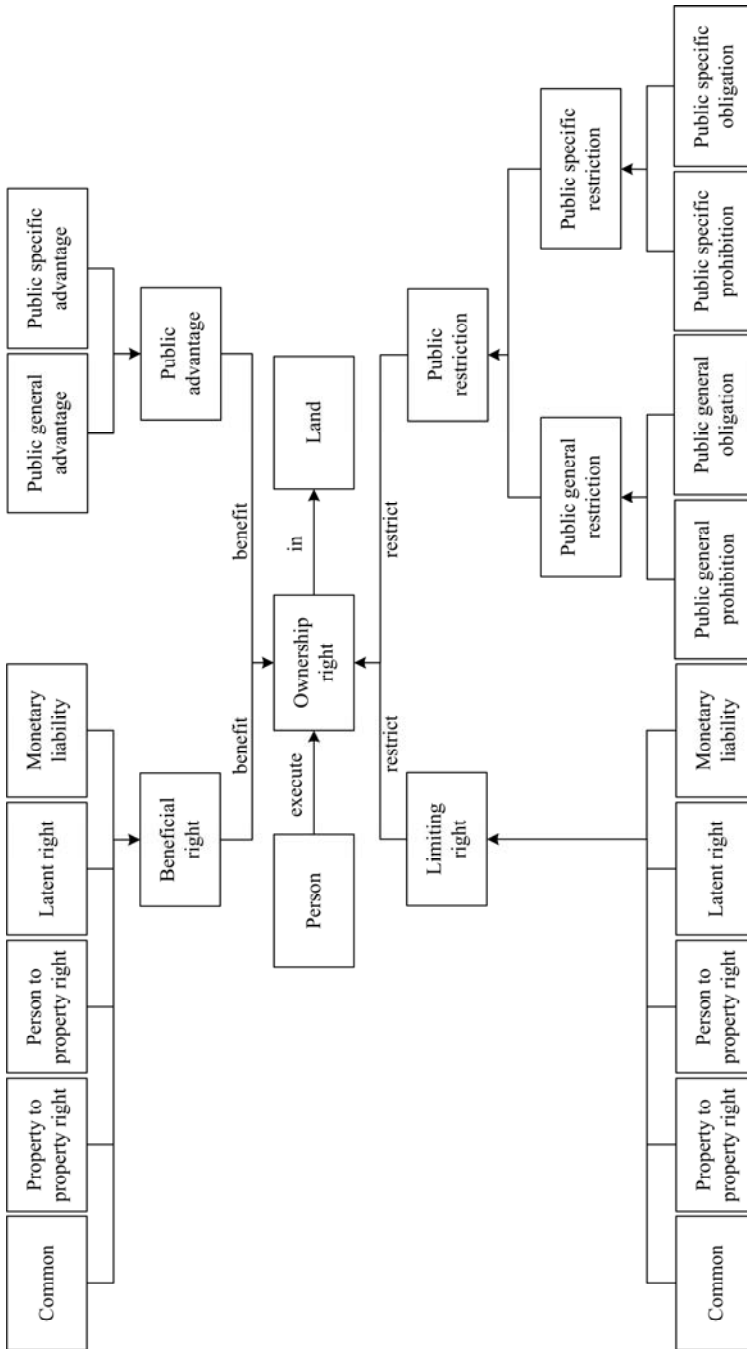


Figure 2. The Legal Cadastral Domain Model.

6 Discussion

The Legal Cadastral Domain Model seems to be suitable for classifying real property rights and public regulations. There are however some issues to be addressed.

The classification in the real property rights part of the model is for the *Common*, *Property to property right* and *Person to property right* classes based on *who* is executing the relation to real property ownership, i.e. if a real property owned by another real property, a property to property relation or a person to property relation. The *Monetary liability* class is based on *what* the relation consist of, i.e. an economical content and not who is executing the relation. The *Latent right* class is based on a temporal condition stating that the rights are not executed yet.

A deeper analysis of who is influencing real property ownership has not been conducted. The rights are only “mirrored” in the model depending on their positive or negative influence on real property ownership, i.e. if the rights are beneficial or encumbering to real property ownership.

The public regulation classes are, however, based on how they influence real property ownership, i.e. what actions are prohibited, obligatory or voluntary to perform on a real property by the owner.

I was aware of these conceptual differences when writing paper 6, but my initial attempts to classify the public regulation classes according to who was executing the regulations did not succeed. It would limit the model to how public administration is structured into administrative units (e.g. municipalities, counties, etc.) and not what type of relation the regulation executes.²⁶

The model is therefore not homogenous in describing the nature of the relations influencing real property ownership. It may be argued that the model would benefit from being consistent in the structure of the relations influencing real property ownership. However, that would involve competence in e.g. organisational and management theory to investigate if the model could be changed to describe either *who* is influencing ownership, *what* does the influence consist of or *how* is real property ownership influenced.

²⁶ A classification of administrative units already exists, at least within the European Union. The classification is based on an existing classification of territorial units for statistics. See INSPIRE (2010b, annex B).

Paper 1 uses the term public restrictions as a general term for public regulations. This is however not correct since restrictions are part of public regulations. This terminological inconsistency has been corrected in paper 6.

7 Future research

The validation of the Legal Cadastral Domain Model has so far been conducted by testing the model on Western legal systems. It is therefore not possible to determine whether the model is suitable for classifying real property rights and public regulations not covered in the case studies, even if they are judged as sufficient for validating this version of the model. Research in non-Western legal systems is therefore needed to further test and develop the model.

There are other research issues which could further develop the model in the future, e.g.:

The model describes the “highest level” of rights and public regulations, i.e. without any deeper specialisation. Further research could aim at expanding the model by e.g. adding sub-classes to specialise the rights extension in time or if the rights or regulations are covering the entire real property or part(s) of it. It would also be of interest to analyse the financial content(s) of rights belonging to the *Monetary liability* class to investigate if they contain structures which could be used for further specialisation of the class.

The case studies in paper 3 and 4 focus on formal rights, whereas so-called informal rights have not been discussed. Informal rights are important in developing countries as an instrument of land management and have gained increased attention in academic circles in recent years.²⁷ Such informal relations should also be incorporated in future research activities.

The case studies in paper 4 have touched upon the concept of rights in rights, which also is an interesting subject for further research.

Another subject for future research activities is to apply the conceptual thinking of the Legal Cadastral Domain Model on existing national registers, i.e. an investigation of the financial, technical and organisational impacts an implementation of the model would have on (re)structuring the content of national registers.

²⁷ E.g. Ubink (2008) and Zevenbergen (2002). See also Lemmen (2010) on the importance of securing social rights in developing countries.

Paper 5 presents a terminological research on three-dimensional (3D) real property. It would be of value for the future development of the Legal Cadastral Domain Model if similar research was conducted on the terminological aspects of the legal components of real property rights and public regulations.

Paper 6 presents a preliminary model of public regulations exemplified with Swedish regulations. It would therefore be of value if this part of the model could be tested on other national legislations to validate, reject or further develop the model.

The research presented in this thesis aims at being in accordance with the Land Administration Domain Model, LADM. I have however chosen not to directly incorporate the LADM in my research, except for paper 3, since the standard is still under development. I hope that my research may be an input to further develop the legal part of the LADM in the future.

8 Svensk sammanfattning (Swedish summary)

Denna avhandling är resultatet av min forskning inom standardisering av markreglerande rättigheter och offentligrättsliga regleringar på Kungliga Tekniska Högskolan, KTH, Stockholm.

Syftet med forskningen har varit att undersöka om det är möjligt att utveckla en modell som möjliggör internationella jämförelser avseende markanknutna rättigheter och offentligrättsliga regleringar som påverkar äganderätten till fast egendom. Modellen som tagits fram benämns *Legal Cadastral Domain Model*.

Avhandlingen består av en sammanfattning (summary) och 6 publikationer, presenterade som paper 1-6 i denna avhandling. Paper 1, 2, 3 och 5 är artiklar publicerade i referentgranskade vetenskapliga tidskrifter. Paper 4 är en rapport publicerad på KTH. Paper 6 är en artikel som har skickats till en vetenskaplig tidskrift för referentgranskning.

Modellen och den därtill hörande teoribildningen är utvecklad i paper 1 och 2. Därefter genomfördes fallstudier med syftet att testa modellen genom att klassificera rättigheter och regleringar i portugisisk lagstiftning, samt rättigheter i tysk, irländsk, nederländsk och svensk lagstiftning. Fallstudierna finns beskrivna i paper 3 och 4.

I paper 3 jämförs min modell med en annan konceptuell modell för klassificering av rättigheter och regleringar som bygger på annorlunda principer. Resultat är att båda modellerna är användbara, men min modell kan vara krävande att ta till sig eftersom den inte är baserad på redan etablerade termer inom juridiken. Det verkar å andra sidan som om min modell har större potential som utgångspunkt för en ”neutral” klassificering av rättigheter och regleringar, oberoende av rättsliga system.

Resultatet från fallstudierna i paper 4 visar att modellen kan användas för klassificering av existerande rättigheter och regleringar, med undantag av några enstaka rättigheter som inte uppfyllde alla krav för inplacering i rättighetsgrupperna. Analysen är redovisad i paper 4. Modellen har därför modifierats för att kunna klassificera alla rättigheter som påträffats vid undersökningen. Dessutom visade det sig att några engelska termer inte var lämpliga att använda för att beskriva markanknutna rättigheter. Även dessa har uppdaterats i paper 4.

Paper 5 innehåller en terminologisk analys av begrepp som används internationellt för tredimensionell (3D) fastighetsindelning.

Paper 6 innehåller en analys av det konceptuella innehållet i offentlighetsrättsliga regleringar rörande markanvändning. Resultatet används för att vidareutveckla den del av modellen i paper 1 och 2 som beskriver offentlighetsrättsliga regleringar.

Forskningsprojektet har visat att det är möjligt att strukturera en begränsad del av ett rättsligt område, och att konstruera en neutral modell för att klassificera markanknutna rättigheter och offentlighetsrättsliga regleringar, oberoende av vilka (västeuropeiska) rättsliga system de skapats i. Modellen behöver testas på andra rättsliga system för att säkerställa att den kan tillämpas på global nivå. Modellens grafiska del kan ses i figur 2 i avsnitt 5. Definitionerna av klasserna som ingår i modellen finns i appendix 1.

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Paper 2	https://uni.uni-hamburg.de/onTEAM/grafik/1164287680/Paasch.pdf
European Land Information System (EULIS)	www.eulis.eu
International federation of Surveyors (FIG)	www.fig.net
International Organization for Standardization (ISO)	www.iso.org

Appendix 1

Definitions of the classes in the Legal Cadastral Domain Model.

The definitions are arranged according to as they appear in the model in figure 2, describing the beneficial right and public advantage classes, the Person – Ownership – Land relation and the limiting right and public restriction classes. The definitions are taken from paper 2, 4 and 6 in this thesis.

Class name	Definition
Real property right classes beneficial to real property ownership	
<i>Common</i>	Real property to land relation executed in land legally attached to two or more real properties. Owners of the participating real properties execute co-ownership rights in the land at issue (Paper 4, p. 100).
<i>Property to property right</i>	Right executed by the owner of real property in another real property, due to his ownership (Paper 4, p. 108).
<i>Person to property right</i>	Right executed by a person to use, harvest the fruits/material of, rent or lease the real property in whole or in part, including the claim against a person (Paper 4, p. 107).
<i>Latent right</i>	Right not yet executed on a real property (Paper 4, p. 102).
<i>Monetary liability</i>	A latent, financial security for payment (Paper 4, p. 104).
<i>Beneficial right</i>	Right beneficial for the use and enjoyment of real property (Paper 4, p. 99).

Class name	Definition
Public regulation classes beneficial to real property ownership	
<i>Public general advantage</i>	Change in legislation beneficial for certain types of real property at a general level, e.g. properties within urban areas, properties being subject for industrial forestry or properties containing cultural monuments. Beneficial to real property ownership (Paper 6).
<i>Public specific advantage</i>	Publicly granted permission to perform activities for a limited and defined set of real properties, otherwise regulated by a <i>public specific obligation</i> or <i>public specific prohibition</i> , thereby restoring parts of the owners use right (Paper 6).
<i>Public advantage</i>	Publicly imposed action which is beneficial to ownership and use of real property (Paper 2, p. 127).

Class name	Definition
Person – Ownership right – Land classes	
<i>Person</i>	Human or legal person, state, municipality and other private or governmental authority who owns real property according to legislation (Paper 2, p. 123).
<i>Ownership right</i>	Right to own real property according to legislation (Paper 4, p. 105).
<i>Land</i>	Part of Earth which is regulated through ownership. Land is the surface of the Earth and the materials beneath. Note: Water and the air above land might also be considered land in some legislation (Paper 2, p. 124).

Class name	Definition
Real property right classes limiting to real property ownership	
<i>Limiting right</i>	Right limiting the use and enjoyment of real property (Paper 4, p. 103).
<i>Common</i>	Real property to land relation executed in land legally attached to two or more real properties. Owners of the participating real properties execute co-ownership rights in the land at issue (Paper 4, p. 100).
<i>Property to property right</i>	Right executed by the owner of real property in another real property, due to his ownership (Paper 4, p. 108).
<i>Person to property right</i>	Right executed by a person to use, harvest the fruits/material of, rent or lease the real property in whole or in part, including the claim against a person (Paper 4, p. 107).
<i>Latent right</i>	Right not yet executed on a real property (Paper 4, p. 102).
<i>Monetary liability</i>	A latent, financial security for payment (Paper 4, p. 104).

Class name	Definition
Public regulation classes limiting to real property ownership	
<i>Public restriction</i>	Publicly imposed restriction prohibiting or mandating certain activities on real property. Limiting to real property ownership (Paper 6).
<i>Public general restriction</i>	Publicly imposed restriction prohibiting or mandating certain activities on certain types of real property at a general level, e.g. properties within urban areas, properties being subject for industrial forestry or properties containing cultural monuments. Limiting to real property ownership (Paper 6).
<i>Public specific restriction</i>	Publicly imposed restriction on doing certain activities or demanding certain obligations for a limited and defined set of real properties, based on specific legislation. Limiting to real property ownership (Paper 6).
<i>Public general prohibition</i>	Publicly imposed prohibition affecting certain types of real property at a general level, e.g. properties within urban areas, properties being subject for industrial forestry or properties containing cultural monuments. Limiting to real property ownership (Paper 6).
<i>Public general obligation</i>	Publicly imposed restriction demanding certain activities on certain types of real property at a general level, e.g. properties within urban areas, properties being subject for industrial forestry or properties containing cultural monuments. Limiting to real property ownership (Paper 6).
<i>Public specific prohibition</i>	Publicly imposed restriction prohibiting certain activities for a limited and defined set of real properties, not to be performed by the real property owner. Limiting to real property ownership (Paper 6).
<i>Public specific obligation</i>	Publicly imposed restriction demanding certain activities from the real property owner, for a limited and defined set of real properties, based on specific legislation. Limiting to real property ownership (Paper 6).

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Legal Cadastral Domain Model – An Object-oriented Approach

Jesper M. Paasch

KTH, Royal Institute of Technology
SE-100 44 Stockholm
and
National Land Survey of Sweden
SE-80182 Gävle
jesper.paasch@lm.se

***Abstract.** The different existing definitions of cadastre make a common understanding of the cadastral domain difficult and are a major barrier to effective information interchange and standardisation. A legal approach focussing on the classification of real property rights and restrictions in a legal cadastre model centred on the right of ownership might be a way to improve the common understanding of the cadastral domain and a step towards an improved standardisation of the domain. This article is intended to serve as an introduction to the construction of a model describing a legal cadastral domain.*

***Keywords:** cadastre, legal cadastre, legal ontology, legal cadastral domain, standardisation, land register, modelling, object-orientation, land information, real property information.*

1 Introduction

This article is a contribution to the on-going research on cadastral modelling and standardisation. The aim is to produce a description of legal real property information focussing on ownership. The article excludes informal rights and restrictions to land, as they are not a part of the legal framework. Other vital components of the cadastral domain, such as owners and geometrical presentation, are not addressed in detail in this study.

The cadastral domain is a vital component in managing spatial and non-spatial legal real property information. A cadastre must be reliable and up-to-date, otherwise the information systems will use incorrect data and the result will end in disaster due to the incorrect data and inaccurate deductions based on it (Au and

Nittinger 1991, p. 93). That is why the content of the legal cadastral domain needs to be described in order to ensure the correctness of legal aspects regarding rights and restrictions in real property, including rights of ownership. It is a necessity when dealing efficiently with real property and is part of the information that needs to be interchanged in connection with e.g. real property transactions¹.

Theories of the emergence of real property rights as well as general descriptions of current cadastral core models are not the subject of this article, since this is already sufficiently covered by others. For example, theories regarding the emergence of property and real property rights due to social, political and economic factors have been presented during the last decades (e.g. Alchain and Demsetz 1973; Demsetz 1964, 1967; Libecap 1989; Sened 1997; and Umbeck 1981). A general description of property rights and restrictions in relation to physical objects (land) has been presented in a Core Cadastral Domain Model and seems to be known all over the world due to numerous presentations in recent years (Lemmen and Oosterom 2003a; Lemmen and Oosterom 2003b; Lemmen, *et al.* 2003).

This article will instead focus on modelling of ownership rights and restrictions, and granted rights regulating ownership, including both official and privately imposed regulations. The aim is to establish a general categorization and description of rights and restrictions regulating the ownership of real property. The outcome is a basic legal model of the cadastral domain centred on real property ownership.

The model serves as a hypothesis, which enables the categorization of ownership rights and restrictions regardless of their emergence in different legal traditions. A better understanding of the legal aspects of ownership could possibly increase the possibilities of producing standards towards the legal cadastral domain.

The development of the model begins with the construction of a preliminary model, based on a theoretical, legal approach to the legal content of the cadastral domain. This preliminary, theoretical model is then tested and developed by applying it on the rather complex body of Swedish real property legislation with the existence of a variety of different kinds of rights and restrictions regulating ownership.

In order to classify both private and public ownership rights and restrictions in a general, legal cadastral domain model, it is necessary to formulate a definition of the legal cadastral domain to be used within the framework of this article. The definition encloses all formal rights and restrictions connected to the ownership of real property as belonging to the legal cadastral domain.

In this article, the legal cadastral domain is used as a common term for rights and restrictions that build up the content of a traditional cadastre, a multipurpose

¹ See e.g. Arruñada (2001) and Stubkjær (2003) for an introduction to real property rights and real property transactions.

cadastre and land register storing legal real property information, regardless of any national differentiation between these registers. In this way, it is perhaps possible to leave the different and rather confusing definitions of cadastre and land register that have been described and discussed by numerous authors. See e.g. Dale (1976); FIG² (1995; 2002); Hawerk (1997); Hegstad (2003); Kaufman and Steudler (1998); Larsson (1991); Silva and Stubkjær (2002); Simpson (1976); Williamson (2001); WPLA (2004); Zevenbergen (2002).

2 Real property rights

If all of mankind has unlimited access to land, we can talk of *open access*. Open access might affect ecological stress on the land if mankind is allowed to do anything in the name of development and economical or personal gain. However, this is luckily seldom the case, since open access only exists in theory, at least if land and water have an economic value.

The opposite to open access is the right of access to an area or piece of land where the right of ownership or use is regulated. We can talk of *limited access*, in contrast to open access. Limited access can be stated by a legal authority that has the legal right to impose such restrictions and transfer them to individual persons, companies (e.g. mining rights), etc. A complete transfer is transfer to ownership rights³.

Fundamentally, a right entitles one or more persons to use the land while others are excluded from doing so. The land is individualised (Mattsson 2003, p. 23). Ownership rights in real property often differ from other rights in human society and many rights in land are not found in goods. Naturally they also often last longer (Simpson 1976, p. 6). The access to land can also be regulated by means of privately agreed upon rights or officially imposed regulations (Mattsson 2003, 2004).

We can say that rights are a link between the legal owner of the right and the areas of land in question. Focussing on the rights as a link between what is in figure 1 called the Subject and Object has the advantage of bringing the rights in correct relation between the owner and the land. An area of land will nearly always have one or more rights attached to it. Ownership is a very strong right commonly connected with land and is executed by the legal owner (i.e. person), e.g. the government, a company or one or more private individuals, according to the legislation in the country in question. However, it is not the piece of land or the resource itself that is owned, but the rights connected to the use the land or resource (Alchain and Demsetz 1973, p. 17). The different relations between subject and object are illustrated in figure 1.

² The International Federation of Surveyors, see www.fig.net .

³ Ownership even entails obligations. As the German constitution eloquently puts it: “ownership obliges” [Eigentum verpflichtet], (Grundgesetz für die Bundesrepublik Deutschland , section 14).

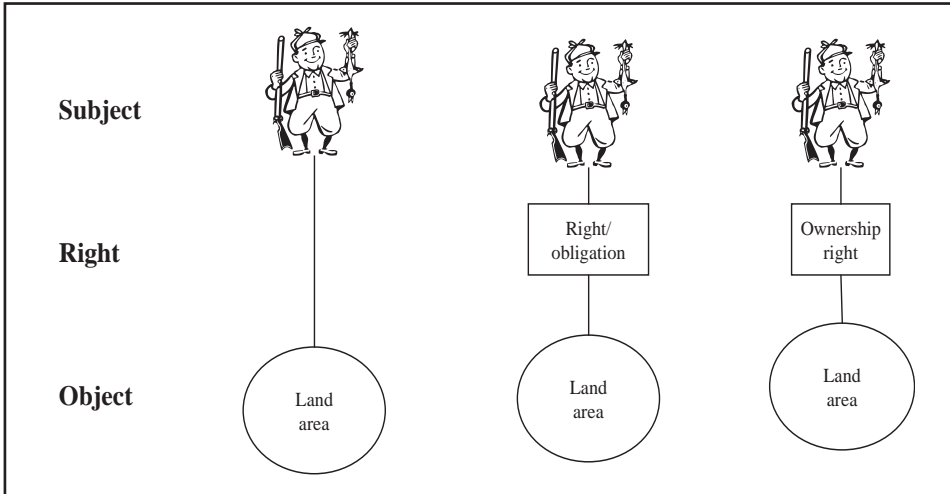


Figure 1. Theoretical connections between man (subject) and land (object) through rights. 1. Direct connection (open access) 2. Connection through Right/obligation (limited access) and 3. Connection through Ownership right (limited access). (Mattsson 2004).

There hardly exists any direct connection between subject and object. The connection is most often through a right. Bearing that in mind, connection no. 1 in figure 1 is probably extremely rare except for cases concerning the open sea. Connection no. 2 is probably more or less always connected with areas of low land values, if maintained within a particular country. It can also be areas with customary rights in many non-western societies. Even if the land is “claimed” by the state, it is not related to the concept of ownership as used in this article. The state, for example, does not claim ownership of the economic zones in the sea, but the use of them can be regulated nonetheless (Mattsson 2004).

Connection no. 1 and 2 in figure 1 are omitted in the following legal discussions concerning the rights associated to real property as they do not focus on the ownership right concept. Connection no. 3 is dominant in legal systems where land is private through ownership rights. This third relationship is what we normally call real property, parcel, freehold, etc. Defining real property is very difficult (see e.g. Zaibert and Smith (2003)) and it is perhaps for our purpose easiest to say as Mattson (2003) that real property is what a national legislation defines as real property. However, in this article, to be able to make a theoretical approach, I use the concept of real property as a *combination* of person, ownership right and land.

As the Core Cadastral Domain Model presented by e.g. Lemmen et al. (2003) is referred to so often in connection with cadastral models, I have to point out some similarities and differences in the terms used in their and my following model. Person is used as a term for the Subject throughout the article and it is also used in the Core Cadastral Domain Model. However, I do not use the terms “RightOrRestriction” and “RealEstateObject” used in the core cadastral domain

model as I see them as being too general when focussing on ownership and separate rights and restrictions in the model developed in this article. “Land” is in my model used instead of “RealEstateObject” as a general term for any physical plot / parcel on the ground / 3D space, buildings / apartments or any other physical entity. “RealEstateObject” has, in my opinion, a too strong relation to real property and does not fit into my definition of real property. “Land” is a more neutral term in this stage of modelling. Of course, the terms might have to be reconsidered if the models are to be amalgamated in the future.

3 Object-oriented legal modelling

Technology has functioned well in the western countries, without the need of special legal or political considerations when implementing new technology because the interaction between the legal apparatus and technology already existed (Hegstad 2003, p. 81). However, the legal apparatus and technology process is not complete without control over the information to be implemented and managed in a technical system. In other words, the information needs to be described or modelled. One way to discuss the legal cadastral domain is to focus on the ownership rights between person and land, described in an object-oriented manner. Such object-oriented modelling is not a new method describing information, but has its roots in system development. Models are originally made to improve the understanding of the complexity of computer systems⁴.

The legal information, regardless of its actual representation in a legal document or a title based cadastre or land register, can be modelled by object-oriented methods. The administrative and legal context must in such a case be included in a formal (computer) model (Frank 1996). However, modelling is more than the construction of computer models. The description of formal models includes the description of ontology and description of the legal aspects of the domain in a principal way⁵.

Blackwell (2000) calls the use of applying object-oriented analysis and design on legislation for “finally adding method to madness”, and states that

Once the problem domain has been adequately described, the object-oriented legislative drafter can move into the design phase of the drafting project. In creating a logical solution to the problem based upon the results of the analysis phase, the drafter will begin to create interaction diagrams that illustrate how objects in the resulting statute will interact to fulfill the requirements of the problem domain (Blackwell 2000, p. 283-284).

⁴ See e.g. Bubenko and Lindencrona (1984); Eriksson and Penker (1998); and Booch, Rumbaugh and Jacobson (1999) for an introduction to modelling.

⁵ See e.g. Wahlgren (1992) for an introduction to automation of legal reasoning and e.g. Uschold and Gruninger (1996); Sure (2003) and Uitermark (2003) and Visser and Schlieder (2003) for an introduction to ontology.

Blackwell focuses on the adequate description of the problem domain. An adequate description must be based on communication. It might be needless to say that any successful communication requires a language that is based on common concepts. The description, classification and hierarchy of objects and the difficulties of standardisation must not be underestimated, which also has been addressed by e.g. Molenaar (1991)⁶. Focussing on the legal aspects and constructing a model categorizing ownership is a way of applying ontology principles to the domain and can be a step towards a future standardisation process.

In this article, modelling is not used to give a detailed description of all theoretically possible relations between ownership, persons and land. The concept of modelling is only used to illustrate the most general relations between different rights and restrictions regulating the right of ownership.

The relations between the different parts of the model produced in this article are illustrated using UML⁷ (Unified Modelling Language) notations, e.g. “0..*” should be read as “zero-to-many”. However, the models are not genuine UML “class diagrams”, as they are very simplified. An attempt to illustrate all relations between person, ownership right and land would lead to a very complicated, complex and probably unreadable model (see e.g. Paasch (2004a, 2004b)) and is therefore omitted. Furthermore, object-oriented modelling normally implies that the classes are illustrated with their attributes and functions. The diagrams in this article are shown without any attributes or functions, as including them would also lead to an unnecessary complication of the general model.

4 Legal cadastral domain model

Without a legal basis, it would be very difficult to establish and maintain a cadastre (Au and Nittinger 1991, p. 89). A legal cadastre model must therefore be as general as possible to be able to function as a core model which is expandable to fit the specific needs of a local cadastre. At the same time, it has to contain the main groups of rights and restrictions related to real property ownership.

Ownership of real property is, however, what is defined as ownership in a nation’s legal systems. In its simplest form, ownership states that a piece of land is owned by a person. The model in this article is centred on the right of ownership, as ownership is the central right in relation to person and land as seen in connection no. 3 in figure 1.

The model is designed to incorporate the definition of real property used in this article (i.e. the combination of person, ownership right and land) and also personal property related to ownership. From a modelling point of view, at least at this stage, those terms are equivalent to the continental legal terms “immovable property” and “movable property”.

⁶ Molenaar (1991) is referring to geographical data, but the problem is the same when defining legal or any other information that has to be defined.

⁷ See www.uml.org.

The relations between person, ownership right and land can be described in a conceptual schema (class diagrams), as illustrated in figure 2. This is a basic model that shall be further developed by introducing other rights and restrictions (see figures 3, 4 and 5). The model will thereafter be developed further by applying Swedish real property legislation. Any alterations in the preliminary model will result in an altered, general cadastral domain model. However, the model needs to be tested on several other national legislations in the future to make it as general and useful as possible.

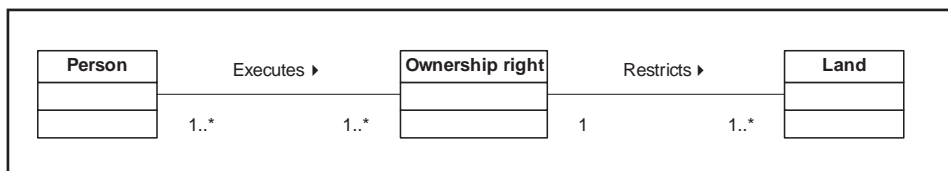


Figure 2. A real property model describing a relation between person, ownership right and land.

Figure 2 describes the relation between person, right and land. It is a legal description of the relation between the owner(s) and a piece of land to which a right can be attached. Ownership rights are executed by one or more persons. The relations are illustrated by 1..*, in the model, which is the UML notation for a one-to-many relationship. The *Ownership right* class has a 1..* relation to the *Land* class. Land, in this basic model, cannot exist without any rights since we have abolished open access (connection number 1 in figure 1) from the model. The *Land* class has a 1 (“one”) relation to the *Ownership right* class.

The model differs from the Core Cadastral domain Model (see e.g. Lemmen, et. al. 2003) by having the *Ownership right* class between the *Person* and *Land* classes, where the Core Cadastral Domain Model has the *RightOrRestriction* class as an association class between the *Person* and *RealEstateObject* classes. In order to produce a model focussing on ownership rights it is necessary to replace the *RightOrRestriction* class with *Ownership right* class illustrating the different rights and restrictions regulating ownership rights.

Although *Land* is a class in the model in figure 2, the model does not develop the geometrical aspects (size, extension, description through co-ordinates etc.) of legal rights. Modelling of these relations can be studied in Lemmen et al. (2003). It might be argued that the *Land* class could be named e.g. Real Property Unit, but that would not be acceptable in this general model. The composition of real property could be seen as being the unification of real property ownership rights attached to one or more physical entities (*Land*). These rights are “owned” and executed by a *Person*. A piece of land cannot, in a legal cadastral context, exist without any ownership (see connection 3 in figure 1). To describe *Land* as equal to a unit of real property would therefore be a rather simplified approach.

Furthermore, the model does not separate different types of persons, such as

natural and legal. Is in this general model a person defined as an individual human being, a company, an organisation and also government.

Absolute ownership right does not exist in most societies and the ownership concept must be made clearer in the model and assets and restrictions must be imposed. The right of ownership is an asset (for the owner of the real property) and a burden (for all others). Other rights and restrictions can also be seen as assets or burdens in relation to ownership.

The model illustrated in figure 3 is an extension and specialisation of the simplified model described in figure 2. The extended model is still centred around the ownership right and attached with classes that benefit or limit the right of ownership. The *Person* and *Land* classes and their relations have been toned down somewhat in the model in figure 3 and the forthcoming models to illustrate that they are not focused upon in this article. However, any further modelling would have to describe *Person* and *Land* in detail and also show how *Person* and *Land* can have relations to other types of rights and restrictions besides ownership rights.

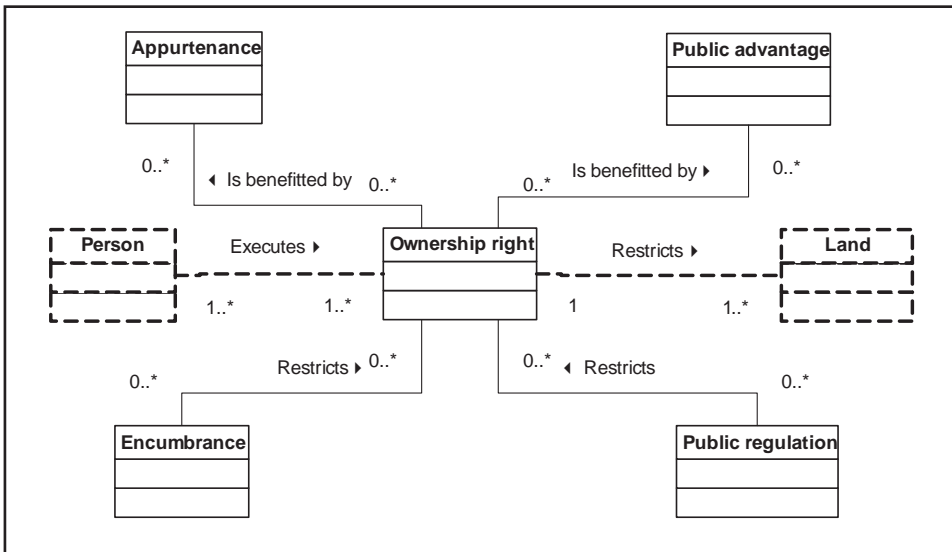


Figure 3. A basic legal cadastre model focussing on ownership right, describing the relation to the *Appurtenance*, *Encumbrance*, *Public advantage* and *Public regulation* classes.

The model in figure 3 is based on the fact that there are certain “rules” (assets or limitations) attached to the *Ownership right* class from the *Appurtenance*, *Encumbrance*, *Public advantage* or *Public regulation* classes. All classes have relations to the *Ownership right* class, since they are benefiting or limiting the ownership right and thereby, according to the definition used in this paper, regulate the real property as such. The content of these classes are defined below.

*Appurtenance*⁸ (Friedman 1984, p. 21) is a beneficial right and is something outside the property itself, but is considered a part of the property and adds greater enjoyment to it, such as the right to cross another's land (i.e., easement or right of way). It is a privilege or right that regulates the use of another property.

An *encumbrance* (Gifis 1984, p. 154) is a burden on a title or a charge on property and any right to or interest in land (Friedman 1984, p. 89) that affects the property's value or use.

A *public advantage* is a state related right that is beneficial to ownership. It can e.g. be a dispensation from existing planning rules regulating the use of neighbouring real properties.

A *public regulation* is a burden imposed on ownership by the state or its representative.

If we to take a closer look at the *Appurtenance* and *Encumbrance* classes and extract their content we see that they contain different legal expansions or limitations to ownership as illustrated in figure 4. The figure is a legal categorization of appurtenances and encumbrances and, in this case, the two groups are treated as the opposite of each other. Public advantages and public restrictions will be dealt with in figure 5.

There is a certain logical legal structure in appurtenances and encumbrances and they can be modelled with several classes in common. The model in figure 4 does not only describe the different rights and restrictions regulating ownership rights, but also their legal content. That is why a class seems to appear in "two places" in the model (as specialisation of appurtenances and encumbrances). It might seem redundant to have the same class in "two places" in the model, but the classes might have different attributes (which makes them unique) and, as explained earlier, the class diagrams are intended to give a rather simplified and explanatory introduction to the categorization of rights and restrictions in relation to *Person* and *Land*.

The main classes in figure 4 are called "*Common right*", "*Real property right*", "*Personal right*", "*Latent right*" and "*Lien*". All rights can be an appurtenance or an encumbrance to ownership. However, they do not necessarily have to exist. This is illustrated by the 0..* relations between the *Ownership right* class and the *Appurtenance* and *Encumbrance* classes. A short description of the appurtenances and encumbrances is given below.

In this model, *common right* does not describe the situation where several people own a piece of land together. Instead ownership right executes a common right in land and not the owners. The right belongs to the real property and when

⁸ Appurtenance must not be misplaced with "appurtenant" which is a term for something attached to something else. Gifis (1984, p. 26) illustrates appurtenant by referring to it as e.g. a burden, which is attached to land and benefits or burdens the owner of such land in his use of it.

the property is sold, the common right follows the property as it belongs to it, not to the owner⁹.

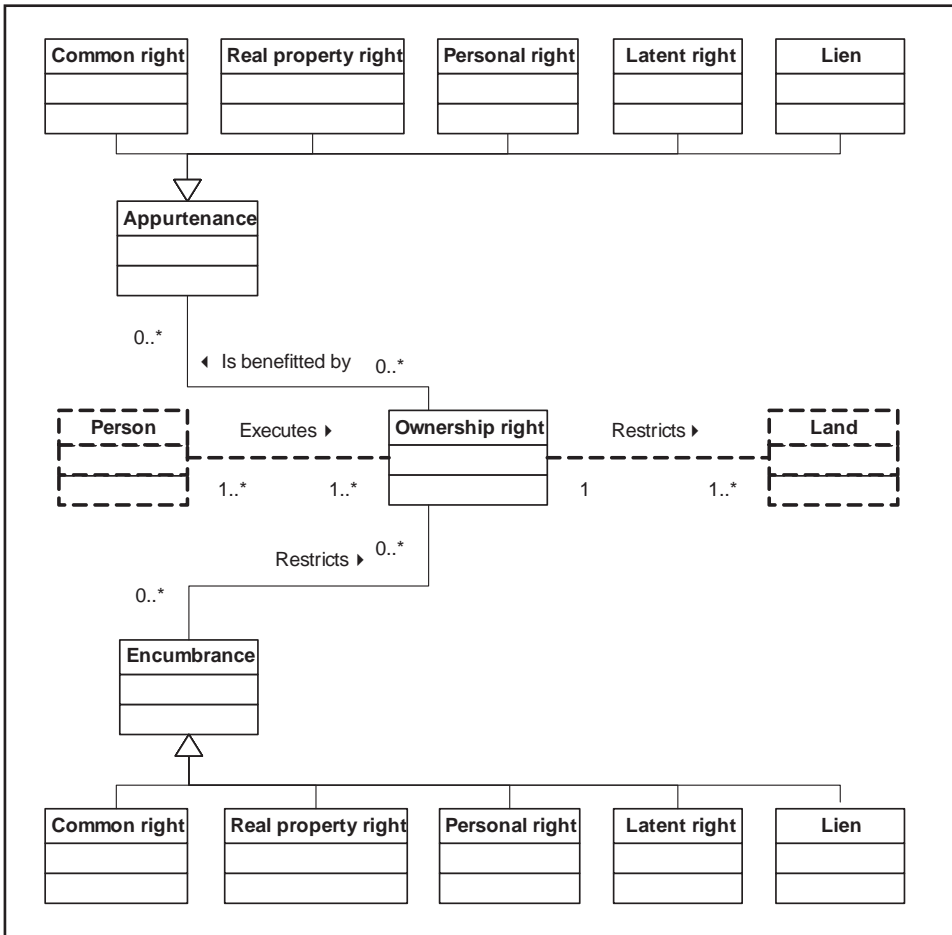


Figure 4. Specialisation of appurtenance and encumbrance in the legal cadastral domain model.

A real property right is a right that can benefit or restrict an ownership right. It is a real property that is related to another real property through this right, e.g. an easement. The right can be specified to be located on the whole property, can be localized to a part of a property or it can be unspecified¹⁰. Property ownership is of course also a type of real property right, but executed in the real property itself.

⁹ It is unclear if there are examples where this land related right can be an encumbrance to ownership.

¹⁰ An example of an unspecified right is an easement stating that a property has the right to drill a well on another property, but the actual location of the future well is not described.

A person has the right to limit or expand the ownership right of real property, e.g. for rent or lease, or a person might (in theory) belong to the property as an asset. This is luckily not the case any more, since it would be the same as serfdom! A personal right can be given to a person on a time-limit basis, for the person's lifetime or forever.

A latent right is a right imposed on ownership, but which is not yet executed, e.g. in an expropriation situation where the government has given permission for expropriation, but the expropriating party has not fulfilled the procedure by seeking a court decision for taking possession. Another example is a pre-emption right for a neighbour's property, which can be both an appurtenance and encumbrance to ownership.

Lien is equal to security for payment. Lien is an economical/financial right, which can be executed on real property and thereby regulates the ownership. An example is mortgage, which is a financial security granted by an owner of a real property to a person, normally a bank or another financial institution, to enforce, e.g. the sale of the property if the mortgagee does not fulfil the specified financial obligations. A lien might be seen as a latent right, but is in this general legal model described as a separate class.

Appurtenances and encumbrances are rights that can be a benefit or restriction to ownership. They can be created by private agreement or with help of a decision by an authority or court. However, state imposed regulations can also be a benefit or restriction to ownership. They can be divided into two classes, *Public advantage* and *Public regulation*, as illustrated in figure 5.

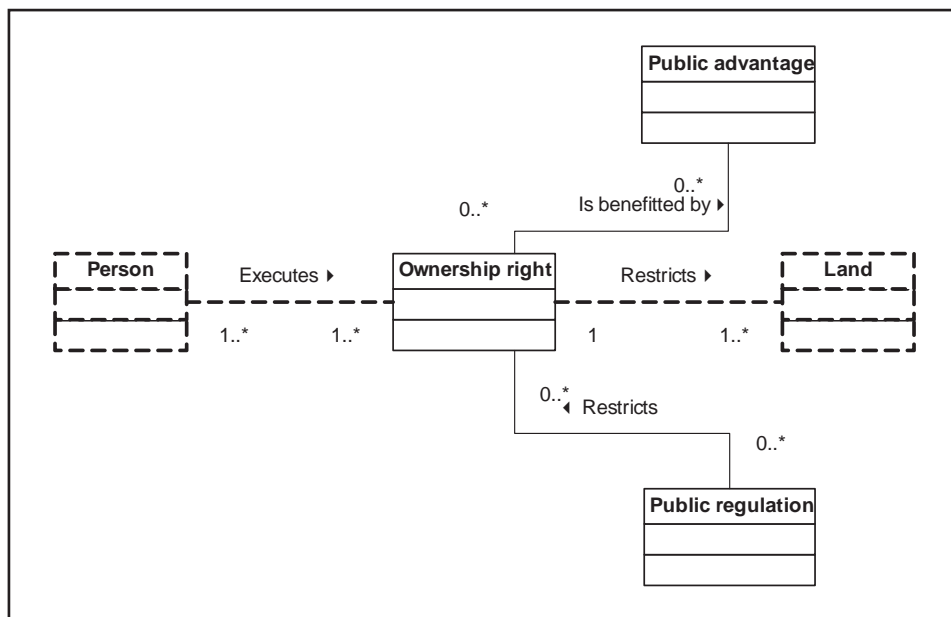


Figure 5. The Public advantage and Public regulation classes in the legal cadastre model.

A *public advantage* is a possible asset to ownership right and a positive result of legally imposed burdens. An ownership right might be benefited by one or more public advantages in form of legislative regulations, but it does not have to be. This is illustrated by a 0..* relation between the *Ownership right* and *Public advantage* classes in figure 5. A regulation might be altered or taken away on one or several parts of real property, by official decision (e.g. granting of a dispensation), benefiting the ownership when compared with the original regulation which is still encumbering the ownership on the neighbouring areas.

The *Public regulation* class contains restrictions which might regulate the ownership right. This is illustrated by a 0..* relation between the *Ownership right* and *Public regulation* classes in figure 5. A public regulation is e.g. a planning regulation of what colour to use when painting buildings in a specific town or area. Regulations can however also be general rules in legislation, regulating the ownership of all existing real properties. This general case is meaningless to cover in the model.

Until this state, the model described above is a theoretical product, even if practical examples have been given. However, the model is of no practical use unless it is tested on real-world real property legislation. In order to finish the modelling process, the model will be exposed to Swedish legislation in the next chapter. At the same time, the author's knowledge is limited to Danish and Swedish law, and therefore the model needs to be tested by others who have their backgrounds in another nation's cadastral legislation.

5 Swedish real property legislation

Swedish ground and water is divided into real properties, which form a geometrical pattern over the country. The ownership of these real properties are benefited or limited by different rights and restrictions, according to a quite large body of acts, statues and regulations. The legislation shall not be analysed in detail, which is beyond the aim of this article, but will be analysed with the classification of rights and restrictions regulating the ownership in mind. The legislation is applied to the suggested classes already described: *Common right*, *Real property right*, *Personal right*, *Latent right*, *Lien*, *Public advantage* and *Public regulation* as illustrated in figure 4 and 5.

Common rights exist in Swedish legislation in the form of a common property unit (*samfällighet*), where several real properties own a share in the common property unit¹¹. The common right is in this case land or water solely

¹¹ Common properties are called "common-pool resources" by Ostrom (1990, p. 30) and refer to a natural or manmade recourse system organised to exclude potential beneficiaries from obtaining benefits from its use. The Swedish common property unit equals the British "commons", which are areas of open land in England or Wales over which adjacent owners and occupiers have certain rights in common (Isaacs and Monk 1986, p.110). It must be noted that the Swedish common property term is not exactly the same as the British term "common areas", which describes areas of a property that are used by all owners or tenants (Friedman 1984, p. 52) and Gifis (1984, p. 80). Lemmen et al. (2003) use the term "ServingParcel" for a commonly hold area.

owned by other properties, which can e.g. use it for grazing domestic animals or extracting natural resources, like timber or fish. If one of the shareholder properties is sold, the share in the common ownership right in the common real property unit automatically follows with the sale.

In Sweden, real property does not have to be directly attached to a piece of land¹², as it is sufficient with an ownership share in a common property unit¹³. The 1..* relation between *Ownership right* towards *Land* in the general model in figure 3 can therefore be changed to a 0..* relationship, which states that an ownership right might be attached to land, but does not have to, because real property can exist without any physical extension. Instead, the owner (i.e. person) is connected with a common right to a piece of land via the ownership right. This is illustrated in the final version of the model in figure 6 in the next chapter. Furthermore, common real property units have a physical extension on the ground, but do not execute any ownership rights of their own in the Swedish legal system, as the rights are executed by the “shareholders”. The 1 relation from *Land* towards *Ownership right* must therefore be changed to a 0..1 relation. The changes are illustrated in figure 6. It must be noted that this scenario has nothing in common with connection no. 1 and 2 in figure 1. The ownership right is still the link between person and land.

A common right is not seen as an encumbrance to ownership in the Swedish legal system and is therefore toned down somewhat in the model in figure 6.

Real property rights are e.g. easements (*servitut*) according to Swedish legislation. An easement is a right for the owner via ownership of one dominant property to use or restrict use (i.e. the ownership) of another servant real property.

Another important example is joint facility (*gemensamhetsanläggning*), which is established through an official decision. A joint facility can for example be a private road, bathing jetty or a parking area where owners via ownership of several properties have a mutual interest in using or maintaining the facility. If the property is sold, the share in the joint facility follows automatically with the sale.

The nature of joint facilities makes them a hybrid between common right and real property right. The physical space for the joint facility is granted in one or several properties like an easement. A joint facility can therefore be classified as a real property right in the model.

Other rights that can be characterized as *personal rights* regulating ownership. The most dominant rights are Right of User (*nyttjanderätt*) and Utility Easement (*ledningsrätt*). Another, for Sweden rather uncommon right, is Profit à prendre (*avkomsträtt*).

¹² Physical objects with no relation to land which can be mortgaged (e.g. boats and airplanes) are not covered in this model as they are not part of the definition of real property used in this article.

¹³ A so-called shared property (*andelsfastighet*) does not have any physical extension of its own, but has a share in a common property. Nevertheless, a shared property is treated as a separate property.

Right of User is a personal right granted by private agreement by the owner(s) of real property to a person and regulates the ownership right via a legitimate interest. It is a right for someone other than the holder of the ownership right to obtain access to and use of real property (i.e. limit the ownership right) for a specific purpose and a specific period. Tenure (*hyra*), leasehold (*arrende*) and site leasehold (*tomträtt*) are the most common Right of User.

A Utility Easement allows the construction and maintenance of an installation, e.g. an electric cable or a pipeline for water supply. It burdens the ownership right and is normally beneficial for a juridical person and is then considered movable property.

Profit à prendre¹⁴ is a right to take something from another person's land. The object being taken is either the soil, the natural produce of the land, or wild animals living on it. The right to take water is normally not included in Profit à prendre, since it is regarded as an easement. Right to Electric Power (*elkraftträtt*) is a specialisation of Profit à Pendre. Profit á pendre is an example of older legislative rights which in such are no longer granted. However, they still exist and limit the ownership right in real property and they are examples of "historic" rights that might exist due to older legislation, etc. and have to be handled when performing e.g. real property transactions.

There are not personal rights classified as appurtenances in the Swedish legal system and the class is therefore toned down somewhat in the model in figure 6.

An example of a *latent right* is expropriation, as earlier described. There are no latent rights categorized as appurtenances in the Swedish legal system. The class is therefore toned down somewhat in the model in figure 6.

Swedish property legislation allows security for payment through mortgaging, thereby imposing on the ownership right of the real property in question. Real property can also have a financial claim in another real property. A *lien* can therefore be both an appurtenance and encumbrance for ownership.

A *public advantage* is e.g. the granting of a dispensation from public regulations. One example is the granting of permission to build a house in restricted areas around a lake or river (*strandkydd*). Such a dispensation can be seen as an appurtenance to ownership.

Public regulations can e.g. be planning regulations which are restrictions imposed by the state or its representative. Examples are regulations in detailed plans governing e.g. the use, height or colour of specific buildings. Another example of restriction is related to activities along shorelines (*strandkydd*). Such a regulation is an encumbrance imposed on ownership.

¹⁴ See Tewson (1967, p. 104-105) for a general description of Profit à prendre.

6 Conclusions

Standardisation of the cadastral domain is frequently discussed today and recommendations are produced by different organisations¹⁵. A standardised approach towards a legal cadastral domain model can be based on a standardised categorization of ownership rights. In the beginning of this article it has been necessary to introduce a definition of the legal cadastral domain and real property in order to be able to construct a model focussing on rights. However, a proper definition of real property and other legal and non-legal parts of the cadastral domain have to be produced. Otherwise, any modelling and standardisation attempt is doomed to fail.

The model developed in this article has been developed from the first, simple model in figure 2, via a more complete model in figure 3, 4 and 5, ending in an elaborated model developed in figure 6. The reason is that the studied Swedish legislation demonstrates the existence of numerous rights and restrictions attached to the right of ownership, which has to be described in a general model. At the same time, the analysis of the Swedish legislation is the first test of the model.

The elaborated model is a classification of rights and restrictions that can be attached to the ownership right from a theoretical point of view. However, the figure does not describe who or what is executing the encumbering rights and restrictions and who or what is benefitted by the appurtenances. This can be a task for further development of the model. It might seem strange that land theoretically might exist totally without any ownership right. This is because Swedish legislation allows the existence of common property units, which is a piece of land that only exists as a right through other real properties' shares in the common property.

The development from the simple model in figure 2 to the more elaborated model in figure 6 illustrates the difficulties encountered when revealing the complexity of a nation's legal system. These difficulties have to be solved before e.g. conducting cross-border transactions of cadastral information on a detailed level. The model in figure 6 is a step towards a general categorization of ownership rights and restrictions and seems to allow the implementation of a multitude of rights and restrictions into a theoretical legal framework. It must be stressed that Swedish legislation is just one of many national legislations, and the model therefore needs to be tested on other real property legislation on an international basis and adjusted if necessary.

Real property has been recognised as vital for the development of infrastructure and good land administration (UNECE 1996). The model produced in this article visualises the complexity of the part of the cadastral domain connected to ownership rights. However, the cadastral domain model does not refer to any nation's specific body of legislation, even if it is tested on Swedish

¹⁵ See e.g. the FIG Guide on Standardisation (FIG 2002).

legislation. The model is general and focuses on the different aspects and relations of real property related rights and restrictions with the right of ownership as a central right. When implemented into a national body of legislation, it might be necessary to specialise some classes in order to fit them into the legislative framework, but the core structure of a general model will probably remain intact and function as a basis for describing a nation's different rights and restrictions regulating the ownership of real property.

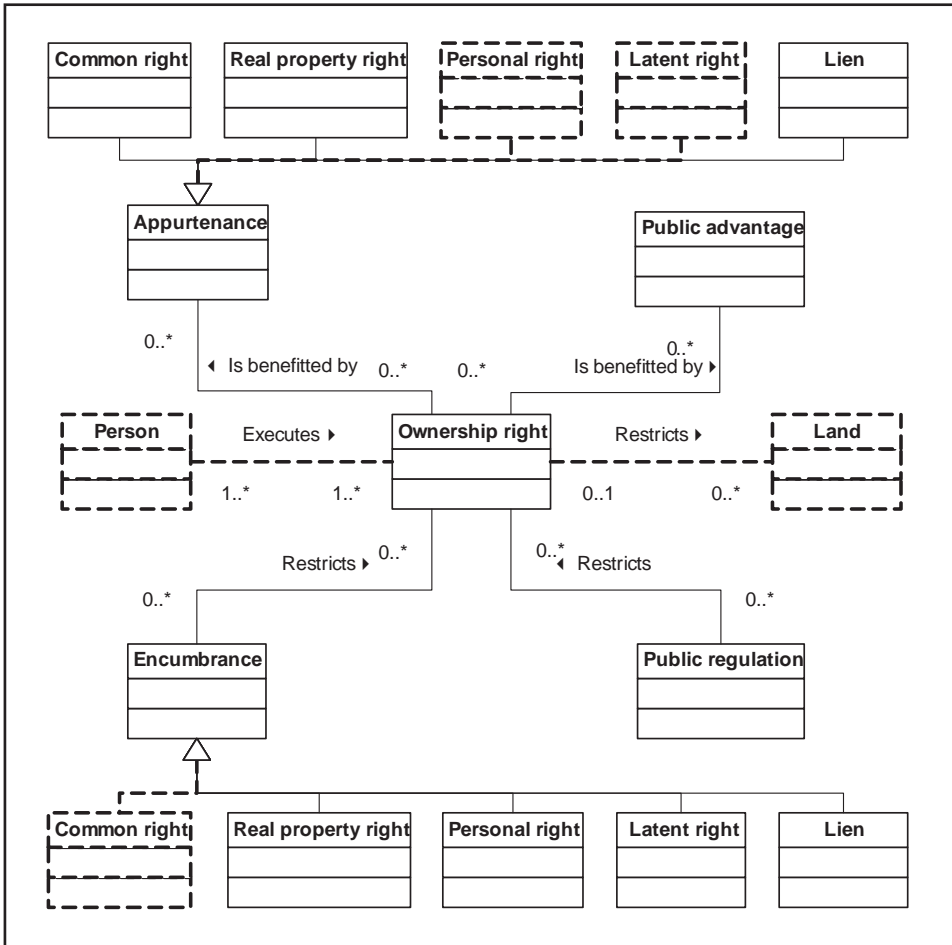


Figure 6. The legal cadastral domain model after alterations due to Swedish real property legislation.

Modelling the legal cadastral domain is knowledge management. Any knowledge management system may only function satisfactorily if it is properly integrated into the organisation in which it is operational (Sure 2003, p. 117). The organisation must be seen on a larger scale, incorporating all organisations

handling information described in a legal cadastral domain model. If not, a legal cadastre model will only express a biased view of the content of the cadastre with the risk of focussing on the definitions of a part of the legal complex, limited by the views of the organisation(s) participating in constructing the legal model.

It is possible to illustrate the logic of law in a general model, but it might be very difficult, even impossible, to come to a mutual agreement regarding completely harmonised rights and restrictions in cadastral legislation on an international level and the use of the same real property terms. However, such harmonisation might not be needed, as improved understanding of real property ownership and rights and restrictions regulating ownership might be a way to build a common bridge between organisations and nations towards a standardized approach describing the legal cadastral domain.

It is not important what we call the different rights and restrictions in our respective, national legislation, but if we construct a common international semantic framework much will be achieved. A semantic framework would make it possible to categorize and describe any real property right. It is my hope that the categorization of ownership rights and restrictions outlined in this article might be a step in the right direction.

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Standardization within the Legal Domain: A Terminological Approach

Jesper M. Paasch

Royal Institute of Technology, Stockholm, Sweden (eMail: jesper.paasch@lm.se)

Abstract This paper is discussing a standardized, terminological approach for describing real property rights and restrictions. Real property rights and restrictions are an important part of the legal domain and function as instruments of conflict resolution regulating the use of real property. The outcome is a classification of rights and restrictions in order to further cross-border transfer of real property information. This paper is a continuation of the theoretical aspects put forth in a previous paper by the author.

JEL Classifications N89, K11, K39, N79, Z00.

Keywords Conflict resolution, legal standardization, real property rights and restrictions, legal modelling, terminology, cross border transactions.

1. Introduction

Law is an instrument stating what is allowed or not allowed in society, i.e. what is legal or illegal, thus commanding citizens how to behave. These ‘commands’¹ issued by a recognised authority provide a framework in which a society and individuals can operate. They also decide who has the right to act or not to act according to the law and their interpretation influence all sectors of our daily life, from how we behave towards each other in traffic to e.g. how to regulate ownership of material and immaterial things. Laws are imposed on both a national level and an international level, aiming at a ‘standardization’ and harmonization of (parts of) the legal domain, e.g. within the European Union.

The internationalisation of law is an old dream, leading to visions of legal integration or even unification (Delmas-Marty 2004). For example,

¹ ‘Command’ is in this paper used as a general expression and does not refer to any specific type of legislation or legal rule.

the French legal scholar Eugène Lerminier (1803-1857) expressed that ‘we may say that there will be a world State, and say it, not simply a chimera, or utopia, but as a real and powerful fact (Delmas-Marty 2004: 247)’. However, as Delmas-Marty (2004: 246) correctly has pointed out, Lerminier was undoubtedly a little quick of the mark and there is today no genuine attempt aiming at the creation of a ‘world State’.

The research outlined in this paper is focussing on the use of terminological principles² within a selected part of the legal domain; real property rights and restrictions. Real property rights and restrictions are regulating and influencing the ownership and use of real property. Applying standardized principles from the field of terminology will help to structure this part of the legal domain.

Real property rights and restrictions are important parts of the cadastral domain³ and are fundamental for effective land use, land management and are main instruments of conflict resolution. However, these means of conflict solutions are not standardized since they originate from different legal traditions and cultural backgrounds.

The cadastral domain has been subject to a standardized approach for a number of years conducted by both the scientific community and professional organisations.⁴ For example, in recent years attempts has been presented to increase uniformity in the cadastral domain through e.g. the presentation of the FIG⁵ Cadastre 2014 statement for a vision for a future cadastral system (Kaufman and Steudler 1998) and the development of a Core Cadastral Domain Model, describing the content of the central parts of the cadastral domain (Oosterom et al. 2006). The model aims at creating a common understanding of the structure of a (multipurpose) cadastre (i.e. a land and real property rights registration system), as basis for creating cross-border information services, where semantics have to be shared between countries in order to enable translations of real property terms.

² Terminology is a science which has its roots in the technical product descriptions in the first half of the 20th century’s industrial sector. Terminology is an interdisciplinary discipline combining theories from other sciences like linguistics, philosophy and information technology. See Pilke (2000), Temmerman (2000) and Suonuutti (1997).

³ The cadastral domain is a common term for maps, databases and other registers managing cartographic and legal information regulating the ownership and use of real property, including different rights and restrictions (e.g. the right to travel over another property or to use a well on another property) which might be attached. See Paasch (2005a) and Zevenbergen (2002) for an introduction to the cadastral domain.

⁴ See e.g. Oosterom et al (2006); Paasch (2004, 2005a, 2006, 2007); Zevenbergen and Stubkjær (2005); Ottens (2004) and Zevenbergen (2002, 2004a, 2004b) for discussions of the non-technical aspects of the cadastral domain.

⁵ The International Federation of Surveyors, www.fig.net.

Another attempt to increase our understanding of the cadastral domain is the EULIS (European Land Information Service) initiative, providing a facility for reaching on-line and up-dated information about land across European borders (Laarakker and Gustafsson 2004, Ploeger and Loenen 2004 and www.eulis.org). EULIS is focusing on mortgaging and conveying of real property, in order to improve the possibilities of cross-border transfer and to compare national practices. The initiative is a contribution to the spreading of knowledge regarding national real property domains to interested parties in Europe. However, the initiative does not provide a fully standardized description of the information concerned, even if the information is described in a uniform way, making comparison easier for the user.

The aim of this paper is to provide a deeper analysis of the content of another standardized approach named the Legal Cadastral Domain Model (LCDM) (Paasch 2005a). The LCDM has been developed as a hypothesis stating that it is possible to achieve a 'neutral' classification and comparison of real property rights and restrictions in order to further cross-border transactions real property information. The model is to be seen as a specialisation of parts of the Core Cadastral Domain Model which only to a limited extent describes rights and restrictions.

More research in the different aspects of real property rights and restrictions within the legal domain is needed. This paper is a contribution to the ongoing research towards achieving cost-effective cross border information services. It focusses on a terminological approach describing real property rights and restrictions. See e.g. Zevenbergen, Frank and Stubkjær (2007). The purpose of this paper is to discuss whether it is possible to identify any characteristics and definitions which would allow the grouping of real property rights and restrictions according to the classification described in the LCDM, without limitation of any existing legal systems. The chosen methodology is based on terminological principles used in international standardization. The aim is to contribute the research on real property transactions by producing a terminological framework which can be used on grouping existing real property rights and restrictions. The establishment of a terminological framework would not interfere with the different legal systems in existence, but make it possible to create a standardized terminology for classification.

The paper does not deal with the organizational and legislative aspects or the resources needed or the normative power to achieve the intended classification.

This paper is aimed for readers with different backgrounds. Primary target groups are cadastral surveyors, real property lawyers, knowledge engineers and other professions dealing with research of implementation of real property legislation and classification in connection with cross-

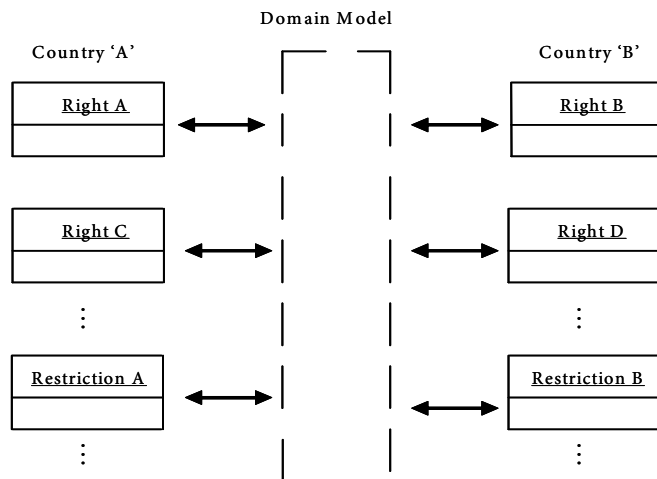
border transfer of real property information. However, this paper should also be of interest to scholars who study standardization and related issues. Some chapters may seem obvious to some readers, but the aim of this paper is to introduce a hypothetical categorization of real property rights and restrictions to a broad academic and professional audience.

When dealing with real property rights and restrictions the use of words also has an economic impact since real property rights and other regulations are a vital tool in conflict resolution throughout the world. The author is of the opinion that standardized vocabularies or descriptions based on the legal content of rights and regulations are important tools in avoiding land and tenure conflicts and even being a tool for furthering cross-border real property transactions (Paasch 2007).

In order to achieve a thorough understanding of a fact, a problem or a semantic network of events, we must understand not only what the case is and what it consists of, but we must also understand how and why it is the case. We are even limited by our own thoughts, as the symbolism we employ when we speak is partly caused by the reference we are making and partly by social and psychological factors (Ogden and Richards 1923).

A standardized classification would contribute to the 'matching' of real property rights and restrictions existing in national legal systems with their corresponding counterparts existing in other national legal systems, even if they are not created by the same legal process or are named in different ways. It would be able to compare a right in country 'A' with the corresponding right (i.e. a right having the same characteristics) in country 'B', since both rights have the same impact on ownership. The principle is illustrated in Figure 1.

Figure 1 The principles of a terminological framework for comparison of real property rights and restrictions (based on Paasch 2007: 177)



It might be argued that an approach focussing only on a very limited part of the legal domain might not be cost effective. However, in order to achieve a scientific depth the research is limited to real property rights and restrictions. The field still covers a significant legal sub-domain which is important for settling of land conflicts and furthering economic development. Assuring access to land is a vital part of a nation's legal infrastructure and economy. Furthermore, any attempt to bring any logic structure into the legal domain must, in this author's opinion, be tested on limited areas of the legal domain and based on terminological principles. If the results of this research are positive it must be considered to expand the terminological approach to other parts of the legal domain by coming research activities.

2. The legal domain

Without the security of a legal framework to ensure individual rights, organised society as we know it and perhaps take for granted would not be able to function. In any large group of people, general rules and principles must be the main instrument of social control, and not particular directions given to each individual separately (Hart 1961: 124). Law is, and must be, authoritative (Watson 2004: 2). The English philosopher Thomas Hobbes (1588-1679) pointed out more than three and a half centuries ago that life would be 'solitary, poor, nasty, brutish and short' without a common power to regulate the activities within society (Hobbes 1651). In order to avoid this depressing situation it is necessary to have instruments of government to secure the rights granted by society and to resolve the conflict of interest which may occur.

There is no given structure in law. Numerous theories regarding the nature, structure and content of law exist and different theories have been presented and discussed by legal scholars during the last two and a half centuries.⁶ The legal domain has been described as being a 'well of legislative source materials with conceptually-shaped buckets of many kinds, and we will then bring up rules, standards, and laws of any favoured pattern' (Harris 1979: 92).⁷ These 'buckets of law' must be described in one way or another in order to bring structure and order to the domain. One attempt to structure the legal domain is to divide it into smaller parts, starting with the fundamental question regarding what law is and to the development of different legal 'families' or other systems of classification. It must be

⁶ See e.g. Wahlgren (1992), Susskind (1987) and Peczenik (1974) for an introduction to the history of jurisprudence and legal reasoning.

⁷ Cited in Susskind (1987: 118).

stressed that there are no official legal ‘families’ or classification of legal systems. Any classification is made on the conditions and principles made up and used by the classifier, and are therefore to some extent subjective. Examples of such families are the Common Law family on the British Isles and the Civil Law families in Continental Europe. The dividing of law into distinct and more manageable components has been - and still is - subject for discussion among legal scholars.⁸ The working definition of law used in this paper is that law is ‘a norm promulgated by the state, on whatever level: a parliamentary act, regulations, promulgated by ministries or implementing agencies [...] or municipal ordinances’ (Seidman and Seidman 2006: 288).

No framework is effective without communication. The use of words and their correct interpretation has always played a central role for communication and thus for culture, and the legal domain is no exception (Glenn 2004). A thorough and correct understanding of the specific legal terms we use when working on mutual tasks and projects are of vital importance for the success of our enterprises. Any description must be understandable by all parties involved and any success is based on the achievement of understanding. However, understanding requires a defined and accepted terminology; otherwise we will not be able to understand correctly what is meant. There are a multitude of different terms used in the legal domain. As a result, terminology and semantics has been subject for much debate among legal scholars and philosophers during several decades (Hoecke 2004, Nuopponen 1994).

The problem of furthering a correct understanding has been subject for much research. For example, Ogden and Richards (1923: 8-9)] eloquently described the problems of understanding as:

There is no doubt an Art in saying something when there is nothing to be said, but it is equally certain that there is an Art no less important of saying clearly what one wishes to say when there is an abundance of material; and conversation will seldom attain even the level of an intellectual pastime if adequate methods of interpretation are not also available.

One of these methods of interpretation of the world around us, consisting of a countless number of objects, allowing us to rise above the level of an intellectual pastime is to apply the principles of terminology to the domain which has to be discussed. This is why terminology is regarded as

⁸ The nature of law has been subject of constant discussions among legal philosophers during the last two centuries. See Hoecke (2004), Zweigert and Kötz (1995), Susskind (1987) and Hart (1961) for an introduction to legal theory and what ‘makes’ the law and what constitutes a legal system.

an important instrument when working within the legal domain. For example, Ekelöf (1945: 221) stated that ‘it is even of rather huge practical importance that certain and clear-cut terms are commonly accepted as representatives for different elements in the process of legal deduction’.⁹

The common nominator for all legal families is that they are expressed in natural languages. With natural languages there is always the risk of misunderstanding, since natural languages are not predefined and clear systems of communication. Words might mean one thing in one legal sub-domain and another thing in another legal (sub-) domain. Therefore, any comparison of legal systems must include a study of the question to what extent the words used in the legal systems which are subject for comparison bear the same meaning (Hoecke 2004: 175).

Research in the field of artificial intelligence (AI)¹⁰ focusses on the translation of terms used in the legal domain into an ‘information theoretical language’ (Peczenik 1974), to be used in automated data processing. It is not possible to know what you are comparing or incorporating into a knowledge base if you are not able to know what it is. Susskind (1987: 116) argues that, in regard to the representation of legal knowledge expressed in natural language in AI, that in ‘[t]his form in which we find our sources is neither sufficiently structured nor formal enough to be fed directly into a knowledge base’. However, Wood (1990) is more straightforward in his criticism regarding how terminological discrepancies has been handled in the discipline of AI and law and stated that:

[t]his [communication problem] has had the unfortunate consequence of creating incommensurable vocabularies and misunderstanding, a ‘tower of Babel’ which has cut researchers of from each other and from the worlds of legal practice an[d] scholarship. The failure to communicate has afforded some researchers the opportunity of shrouding their work in mystery and of avoiding criticism.¹¹

Even if things hopefully have changed to the better in recent years, Woods statement is important since it illustrates the need for openness and co-operation when working with terminology. Without a defined terminology describing the subject or domain that is being researched, every attempt to further a common terminological approach will forever be shrouded into mystery.

⁹ Author’s translation from Swedish.

¹⁰ AI is, among other things, an attempt to create an ontology for selected parts of the legal domain. See Susskind (1987) and Wahlgren (1992) for an introduction to AI. AI is not discussed in detail in this paper.

¹¹ Cited in Wahlgren (1992: 36).

Legal reasoning is a complex process and diversity might be explained by that researchers have concentrated on different areas of the legal domain and ‘...that a number of things that initially stand out as dissimilarities might be explained by the lack of inconsistency in the use of terminology’ (Wahlgren 1992: 43). Nevertheless, without an established terminology, nothing can be compared or harmonized. There are several factors to take into account when applying terminology in the legal domain. A law is not always easy to understand and the use of words in the legal domain is surrounded by the same semantic problems of interpretation of words in other domains. Peczenik (1974) illustrates this by using the word ‘house’ as an example, and notes that ‘cabin’ or ‘hut’ under some conditions can be called a house and sometimes not. Even if a word or expression is ambivalent or vague, it is not interesting to describe every possible interpretation and focus is made on the specific case where the word or expression is used (Peczenik 1974: 61f). A problem is that the legislator cannot foresee all possible future use of a law and vague words and expressions might leave room for different interpretations, sometimes due to situations that were not present when the law was made. However, legal institutions are obligated to follow the intentions of the law, even if it might result in words and legal practices differing from each other within a legal system, or even worse, within a single law (Peczenik 1974). Strömberg has stated that knowledge in conceptual analysis can be of help in research regarding the use of legal tools. However, such knowledge does not ‘completely scatter the existing obscurity of how laws and precedents shall be interpreted and how the existing legal body shall be used (Peczenik 1974: 19)’.¹²

The semantic problems of the legal domain described above are even more complicated, when concepts originating from different legal systems describe the same thing, but are called by different names, or worse, when terms originating from different legal systems are used to describe *more or less* the same legal concept. For example, a specific type of right regulating the (partial) use of another real property, ‘easement’, is, according to Hoecke (2004: 174), rather similar to another real property right, ‘servitude’, but is not the same. However, recent guidelines on real property units, published by the United Nations, describes a servitude as an easement or right of one real property over another.¹³

The more or less fruitless initiatives of different legal movements to

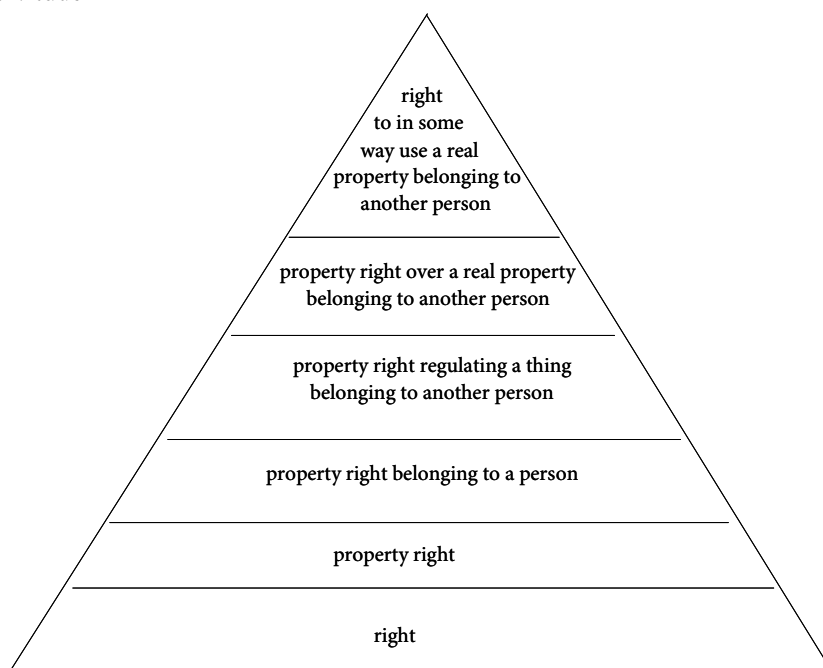
¹² Strömberg, T., cited in Peczenik, (1974: 19). Title and publication date are not referenced in Peczenik due to a printing error. Author’s translation from Swedish.

¹³ (UNECE 2004: 61). An example is the right to use a road located on another property or to use water from a well located on another property.

solve the problems of semantics and terminology within the legal domain have been reported by several authors, e.g. Zweigert and Kötz (1995); Wahlgren (1992); and Susskind (1987). However, the legal movement of conceptualism¹⁴ has gone further than most others, claiming that everything could be described and defined by applying methods originating in the natural sciences. German legal scholars were in the second half of the 19th century much in favour of the ideas described in conceptualism (in German: *Begriffjurisprudenz*), admiring the achievement of exact results in the realms of natural science and striving at such exact results in their own, legal field.

The aim of conceptualism was to find legal concepts without any faults and every legal interpretation should have only one, right solution. In other words, law was in those circles seen as a standardized system of rules allowing only one, thus correct, answer, trusting in the emerging principles of natural sciences, where everything seems possible to be understood and explained. An example is the structure of the above mentioned 'servitude'. Puchta (1798-1846) has produced a 'conceptual pyramid' of the 'logical components' of a servitude.

Figure 2 Puchta's conceptual pyramid illustrating the 'logical components' of a servitude



¹⁴ The expression is used by Wahlgren (1992). See also Susskind (1987), Strömholm (1981), and Peczenik (1974) for an introduction to conceptualism.

A servitude is, according to Puchta, first of all a right, then a property right, then a property right belonging to a person, then a property right regulating a 'thing' belonging to another person, then a property right over a property belonging to another person, then a right to in some way use a real property belonging to another person.¹⁵

This logical method would, according to the conceptualists, bring order and structure to the complex and unstructured legal world. However, conceptualism has been subject of much criticism during the 19th and 20th centuries, stating that it is impossible to structure the legal domain, based on traditions, history and culture as if they were components of the natural sciences. Conceptualism has during the years maintained a rather bad reputation among legal scholars. To call the working methods of a legal scholar for conceptualism today is, according to Peczenik (1974: 148), actually regarded as almost insulting. The downfall of conceptualism was due to the too rigorous formulation of legal principles, unclear and unmotivated definitions without any relation to how legal work was carried out in real life. Rudolf von Jhering (1818-1892), who earlier had been much in favour of conceptualism, wrote a very satiric book stating that conceptualists after their death would ascend to a 'conceptual heaven', where they after their death, without intervention from social life, could reflect on concepts like 'right to a right'. There would even be a 'hair-splitting machine', to which you could not get access without breaking down a wall with your head (Jhering 1884: 245-334)!¹⁶

However, even if conceptualism is regarded as almost insulting today, we might use some of the principles incorporated in this method, e.g. the appliance of logic and structure on selected areas of the legal domain to achieve a standardized approach, without going back to the extreme wish to standardize 'everything', which reduced the movement to an intellectual pastime and a curiosity in legal history.¹⁷

However, even if we consider contraptions such as a 'hair-splitting machine' as an amusing fictional anecdote, it does not take away the need for a common language for communication. This has even become more important during the computer age where e.g. correct registration of a real property right can be of vital importance for processing and analysis of information and the settling of land related conflicts. An example is the use of standards and an accepted vocabulary when storing information

¹⁵ Referenced in Peczenik (1974: 145). Author's translation from Swedish.

¹⁶ Jhering is sometimes written as Ihering.

¹⁷ Even if conceptualism is reduced to a historical curiosity today, the movement has had a strong influence on the establishment of the German legal system in the 19th century (Peczenik 1974).

regarding real property rights and restrictions in a nation's real property management system. For example, the importance of a standardized approach to real property information was noticed in connection with the establishment of the digital Swedish real property register and that '[t]he aim has to be the fitting of the separate registers into a uniform flexible net of information systems. This uniformity implies that the different registrations within the net must be able to fit in an integrated information processing' (SOU 1966: 310).

It might be argued that the legal domain is neither sufficiently structured nor formal enough to be described into a computerized knowledge base since the domain involves the complexities of both syntax and semantics. This makes it difficult to be incorporated into legal expert systems and other databases. Furthermore, the shortcomings and inconsistent use of our natural languages has led to the development of a domain related specific language with its specific vocabulary, terms and synonyms. However, a terminological approach, focussing on the characteristics of rights and restrictions regulating ownership and interests in land might be a way to bring structure to this part of the legal domain.

3. Terminological approach

Terminology is a methodology to describe and order the use of terms and language in a number of fields. This advanced method of furthering understanding has a vital role in not only in the traditional IT community. One example is the developing of ontological models describing parts of the legal domain, e.g. the management of Intellectual Property Rights (Gangemi et al. 2005, Sagri et al. 2004).

The theoretical ideal for normative terminology is to have *one* expression describing *one* concept, but for the achievement of effective communication within specialist domains the use of synonyms cannot be excluded (Pilke 2000: 281). For example, a 'cat' is not only a four legged, furry creature (*Felis silvestris catus*) which we all are familiar with, but can also be a whip or a part of a ships equipment, depending on our own preferences. A 'cat-of-nine-tales' is an expression for a whip (Oxford 1995: 228) and 'cat' is also a sort of tackle used on ships (Paasch 1885: 150). In order to communicate with each other, we are forced to establish mutual preferences which we all agree too. We must, in other words, standardize our vocabulary to improve communication.

In order to apply a terminological approach we must first take a look at the basic components used in terminology: concept, object, characteristic,

definitions and term.¹⁸ These components are closely related and one is either the result or basis of another.

Object An object is anything that is perceivable or conceivable. Some objects are material, (e.g. a piece of land), immaterial (e.g. a planning zone) or imagined (e.g. a unicorn). However, we cannot speak of objects in the real world, since we do not have the ability to see the world with neutral and non-biased eyes. We have our own understanding or perception, i.e. a mental picture, a concept (see below), of what we see. It might be a house, chair, horse or, focussing on the legal domain, a right in real property.

Concept A concept is a mental construction of the real world formed in our own mind. A concept does not stand alone, but is part of a concept system, where concepts are put in relation to each other according to specific rules. Concepts are based on a selected number of characteristics (see below) that we think best describe the object we see (Suonuuti 1997). Concepts are in a terminological approach to be considered mental representations of objects within a specialised context or field.

Characteristics It is the characteristics which make us identify the 'real world' when we create our vision of it in our mind as a concept. If we, theoretically, never have seen a 'house', we still are able to produce the concept based on characteristics like walls, roof and windows and the fact that the building is intended to be used for dwelling or industry. However, we would not call it a 'house', but something else since a 'house' does not exist in our mental view of the world.

Definition We cannot use objects, concepts or characteristics to communicate effectively. In order to communicate precisely we need to define the concept as a unit. To define means to describe the concept by a descriptive statement which serves to differentiate it from other, related concepts. Producing definitions is producing 'true' statements or statements as near to 'truth' as possible, delimiting the concept from other concepts.

A definition must be as precise as possible to avoid misunderstandings and confusions. Ambiguity of words makes it difficult to express precisely what is meant. A general, methodological problem is the use of words. It is a major task for any standardization project to apply the correct terminology and ensure the correct understanding of the texts and diagrams describing the content of the standard. However, it would be rather

¹⁸ This chapter is based on the international standards ISO 704 (2000), ISO 860 (1996) and ISO 1087-1 (2000) unless otherwise noted.

complicated to always use definitions when we communicate. We therefore need *terms* to express them.

Term Terms are the instruments we use for communication. A term must have a specific meaning, based on the definition delimiting and describing a concept. Otherwise it would mean different things to different people. A term is a verbal designation, i.e. representation of a concept by a sign which denotes it within a specific subject field. A term might exactly describe the object in question, but it might also be a commonly accepted word. For example, the use of the English term 'Parcel' does not only mean (a part of) land belonging to a real property, but also does also mean a small container used for sending postal goods. The English term 'Lot', does, among other things, also mean a part of land. The problem becomes even greater when communicating in different languages. Communicating with other communities we are forced to use other terms based on the same concept described by the same characteristics, e.g. 'Katasterparzelle' (German), or 'Fastighetsområde' (Sweden), which equals the English real property term 'Parcel'. Terms may not only consist of words. Symbols, e.g. ©, @ or \$, are also considered terms as they describe real or imaginary objects (ISO 704: 2000).

Any term must be based on the discussion of our mental pictures of real world objects, delimited by a number of characteristics which are mandatory for the object in question. The characteristics are the basis for how we identify, describe and name an object. It is the relations between the terminological elements that are the basis for any description.

4. A legal cadastral domain model

Bearing the principles of terminology in mind, we are now able to illustrate our understanding of parts of the real world and communicate the result using terms based on certain characteristics and definitions. The LCDM described below is a hypothesis classifying rights and regulations regulating real property. The accompanying descriptions listing the characteristics and definitions are placed in appendix.

It must be noted that 'to own' has not been properly defined by any author and is somewhat unclear. Black (2004: 933) describes ownership as a 'bundle of rights' allowing one to use, manage, and enjoy property, including the right to convey it to others. Friedman, et al. (1984: 193) describes real property ownership as methods of owning real estate, which affect income tax, estate tax, continuity, liability, survivorship, transferability, disposition at death and at bankruptcy. Gifis (1984: 331) describes ownership as one's exclusive right of possessing, enjoying, a

disposing of a thing. In this paper ownership is regarded as the right to sell, transfer or in other way use a piece of land. To 'own' is, in its outmost consequence, the 'ultimate' right to a piece of land. See, e.g. Stubkjær (2003), MacCarty (2002), Honore (1987) and Snare (1972) for discussions regarding ownership.

The approach is based on the hypothesis that it is possible, in contrast to what Jhering believed only could be done in a conceptual heaven, to structure 'rights to rights'. The numerous rights (and restrictions) influencing real property can be systemised as belonging to a few numbers of 'classes'.¹⁹ Furthermore, they are 'connections' between real property and the one's who are executing them, e.g. a person who has been given the right to harvest fruits from the land. The connections do not have to exist, but there might also exist one or more rights or restrictions. These connections can be expressed as being either beneficial or burdening to ownership, based on their characteristics. The LCDM is intended to give an explanatory view of the categorization of real property rights and restrictions in relation to the *Person*, *Ownership right* and *Land* classes.

Ownership right is in the LCDM used as an equivalent for real property (i.e. the connection between land, person and ownership), in the same way as the real property registration number symbolises the whole real property in modern registrations systems. That is why the relations expressed in the model go from the different rights and restrictions to ownership right and not to land and person.

However, real property is in this paper defined as land in combination with ownership and person (Paasch 2005a). The LCDM illustrated in Figure 3 allow the existence of a real property without any land, since there is the possibility that it exists without having any direct, but indirect connection to land, since they only exist as shares in other real properties which have land. Illustrated by the 'zero-to-many' (0..*) relation in the model. This is e.g. the case with the Swedish 'andelsfastighet' (shared property).²⁰ However, the most common scenario is that a real property has land and is executed by a person - ownership right - land relation.

The rights and restrictions in Figure 3 have relations to the *Ownership right* class, since they are benefiting or limiting ownership and thereby, according to the definition used in this paper, regulating the real property as such. They are divided into four main sections: *Appurtenance* (i.e. rights beneficial to ownership), *Encumbrance* (i.e. rights burdening to owner-

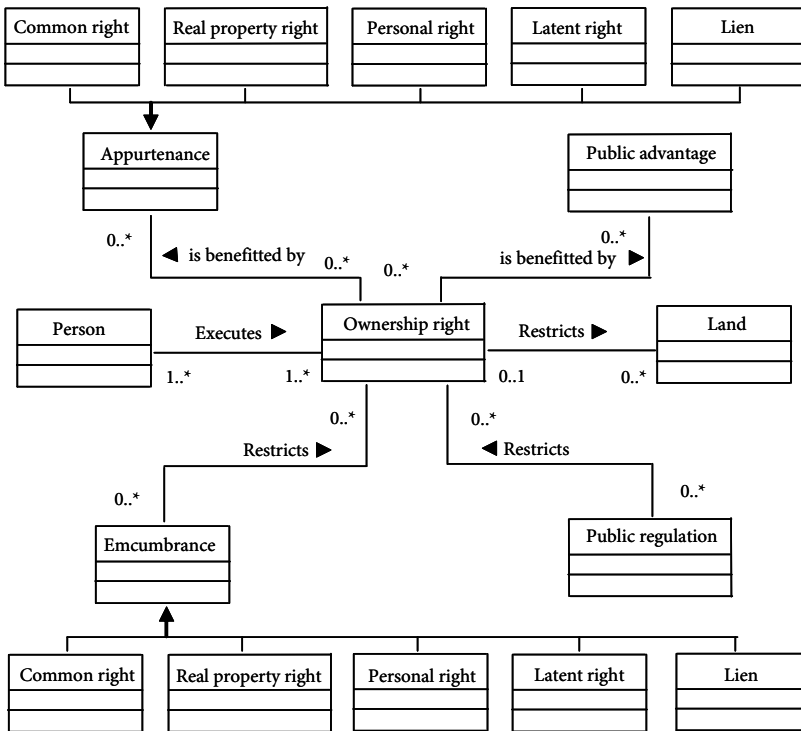
¹⁹ 'Class' is a term used in UML (Unified Modelling language). A class is normally presented as a box.

²⁰ A Swedish shared property exists solely as parts in other real properties and does not have any land of its own.

ship), *Public advantage* (i.e. public regulations beneficial to ownership) and *Public regulation* (i.e. public regulations burdening to ownership).

The appurtenance and encumbrance classes are divided into specific types of real property rights which are labelled ‘*Common right*’, ‘*Real property right*’, ‘*Personal right*’, ‘*Latent right*’ and ‘*Lien*’. All rights can be an appurtenance (i.e. beneficial) or an encumbrance (i.e. limiting) to ownership. The classes appear in ‘two places’ in the model mirroring each for pedagogic reasons, being either beneficial or limiting to ownership. Publicly imposed restrictions are labelled ‘*Public advantage*’ (i.e. beneficial to ownership) and ‘*Public regulation*’ (i.e. limiting to ownership).

Figure 3 A legal cadastral domain model (based on Paasch 2005a: 132)



The analysis of the content of the classes is limited to the real property domain. It would otherwise be difficult to make clear and precise definitions. An example is the characteristics describing a ‘person’, which are limited to human and legal persons which own real property according to legislation. The definition of ‘person’ would have to change if used in another context where it is of no importance whether a person is allowed to buy or own a property or not. For example, a person executing a right is not the same person as described in the ‘*Person*’ class, which is limited to

the person(s) who own the real property in question. An example of a description of a class is shown in Table 1. All classes are described in the appendix.

Table 1 Description of 'Person' in the Legal Cadastral Domain Model

Class	Object
<i>Person</i>	Owner of real property
<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • Part of the <i>Person – Ownership right – Land</i> connection • An entity, i.e. an individual or an incorporated group having certain legal rights and responsibilities²¹ • Can be any physical or legal person, also including state, municipalities and other private or governmental authorities • Owns real property according to legislation 	
<p><i>Definition</i> Human being or legal person, state, municipality and other private or governmental authority who are owns real property according to legislation.</p>	

At the moment the author cannot see the duality of all classes, e.g. the existence of encumbering *Common rights* or appurtenant *Personal rights*. However, they are part of the theoretical model where appurtenances and encumbrances are mirroring each other. Their existence will, together with the other classes, be validated or falsified through case studies on different legislations.²² The case studies will focus on the validation or falsification of the characteristics and definitions described in the appendix. This means that the model in Figure 3 might be changed, too, depending on further research.

This paper has so far been focussing on legal domain, terminology, and a description of the LCDM. However, it is necessary to describe the interaction between the legal domain and standardization in order to analyse if it in fact is realistic to apply the term on the legal domain and if the approach described in this paper in fact is a standardized approach.

²¹ Based on Gifis (1984: 343) and Freidman (1984: 200).

²² The model has so far only been briefly tested on the Dutch and Swedish legislation by the author. The tests were positive, even if there were some discussions regarding the classification of some rights due to Dutch legal traditions (Paasch 2005b). Further studies of the Dutch and Swedish legislations, together with studies of the Irish and German legislations are currently being planned by the author.

5. Interaction between the legal domain and standardization

According to Jørgensen (1997), legislation is the oldest way of standardization we know. However, these legal instruments are traditionally normally not regarded as formal standards. Legal rules and standards are not substitutes, but interact. They are the result of different processes. Formal standardization differs from legalisation in the way that standards are private agreements based on voluntary implementation and legislations are officially imposed rules. However, it is possible to talk about e.g. the standardization of legal rules and procedures as long as we keep in mind that we do not mean the process of formal standardization by a national or international standardization institute. The legal domain can be seen as a 'standardized' framework in which a society and individuals can operate. See e.g. Adams (1994), who discusses the 'standardization' of legal norms and regulations within the European Union.

During the last decades the increased use of computers and the establishing of databases on a national level has forced a standardization of terms within numerous fields in order to communicate effectively between e.g. governmental and municipal organisations. Furthermore, there are situations where standards are used as legislative references. A governmental body may issue legislation based on the implementation of certain standards or actions fulfilling the intentions of certain standards. If legislation refers to a standard, the use of the standard might become mandatory in the fields which are covered by the standard. Examples are the New Approach and the Global Approach initiatives²³, launched by the European Commission (EC). The principle is based on the use of standards in order to reach the essential requirements allowing a product free movement on the European market. Furthermore, the EC does also have the possibility of inviting the European standards organizations to elaborate European standards and enabling the free movement of goods (EC 2000). However, the application of standards is voluntary and a manufacturer may use other means than standards to meet the technical requirements laid out in a standard, thus fulfilling the requirements.

Legislative harmonisation is limited to essential requirements that products placed on the Community market must meet, if they are to benefit from free movement within the Community. Another example

²³ As regulated in EC Directive 98/34/EC and its amendments. See EC (1998a), EC (1998b) and EC (2000).

illustrating the co-operation between the concepts of legalisation and standardization is the continued development of the Core Cadastral Domain Model (CCDM) (Oosterom et al. 2006). The CCDM has recently been submitted as a proposal for formalising the model and elevating it to an international standard (ISO 2008).²⁴

There are also several glossaries describing land tenure (i.e. rights in a land owner's resource) and other land and ownership related terms in existence throughout the world today, aiming at improving the correct use of terms applied in the cadastral domain, e.g. UNECE (2004), Leonard and Longbottom (2000) and Bruce (1998). These glossaries are important tools when communicating within the real property field, but they are, in this author's opinion, to be seen as a rather limited tool for structuring a common terminology due to the fact that they are based on the principles of different legal families or legal traditions, regardless of their good intentions. In many cases they can therefore not be seen as an efficient way of furthering any standardized approach towards the structuring of real property rights and restrictions on a pan-national level.

6. Conclusion

The aim of this paper has been to discuss a terminological framework for the handling, processing, retrieving and exchanging of real property information on a pan-national basis. The author has argued that it is necessary to develop a framework based on the characteristics of real property rights and restrictions. A terminological framework would make it easier to compare rights and restrictions existing in different legislations, thus reducing transactions costs in pan-national real property transactions.

During the last decades, the terminological aspects in regard to the correct registration and use of e.g. real property terms have become increasingly important. They are meant to improve the harvesting, handling, processing and exchange of digital information for land management in a cost effective way.

The first step has been to achieve conformity of the registration on a national level, regulated by one's own national body of real property legislation, for creating computerised national real property registers. During the last decades this has to a large extent been done by national authorities. However, an analysis of the terminological aspects of the legal domain in regard to the Legal Cadastral Domain Model and the description of the characteristics describing real property rights and restrictions in the model

²⁴ The model has been renamed to Land Administration Domain Model when it was submitted to ISO, see (ISO 2008).

are the next step from national registration towards pan-national exchange of real property information. This would make comparison easier when conducting cross border real property transactions without changing the existing national real property legislations and real property registers.

This paper has illustrated that it is possible to apply the principles derived from traditional terminology on a limited part of the legal domain. However, more research is needed to confirm or falsify the Legal Cadastral Domain Model outlined in this paper, especially through testing the proposed terms, characteristics and definitions by means of case studies on real property rights and restrictions originating from different legal families.

Appendix: Description of the classes in the Legal Cadastral Domain Model, LCDM

The classes with their designating term, characteristics and definition listed in *table A1* below are the content of the LCDM. The content is to be seen as the highest level of information. Each class can be divided into sub-classes refining the content of each type of right or restriction. Examples are the division of personal rights into time-limited rights and rights granted for the duration of the right holders' life. Another example are subrights, e.g. real property rights established through lease.

Table A1 The characteristics and definitions of the classes illustrated in the *Legal Cadastral Domain Model* illustrated in Figure 3

Class <i>Person</i>	Object Owner of real property
<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • Part of the <i>Person – Ownership right – Land</i> connection. • An entity, i.e. an individual or an incorporated group having certain legal rights and responsibilities²⁵. • Can be any physical or legal person, also including state, municipalities and other private or governmental authorities. • Owns real property according to legislation. 	
<p><i>Definition</i> Human being or legal person, state, municipality and other private or governmental authority who owns real property according to legislation.</p>	
Class <i>Ownership right</i>	Object Ownership of real property

²⁵ Based on Gifis (1984: 343) and Freidman (1984: 200).

<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • A connection between <i>Person</i> and a specific piece of <i>Land</i>. • An executed right to own real property. • Can be executed by one or more <i>Persons</i>. • Subject to legislation. 	
<p><i>Definition</i> Owns real property according to legislation.</p>	
<p>Class <i>Land</i></p>	<p>Object Part of Earth</p>
<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • Part of the <i>Person – Ownership right – Land</i> connection. • Solid entity. • A limited part of Earth. • Can be regulated through legislation. 	
<p><i>Definition</i> Part of Earth which is regulated through ownership. Land is the surface of the Earth and the materials beneath. <i>Note</i> Based on UNECE (2004: 58). Water and the air above land might also be considered land in some legislation.</p>	
<p>Class <i>Common right</i></p>	<p>Object A connection between two or more real properties</p>
<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • An executed right by two or more real properties in land owned by the properties. • The right is transferred together with a real property when the property is sold or otherwise transferred. • The right is similar to <i>Ownership right</i>, but executed by real properties, not persons. • The right can be beneficial or encumbering to ownership. <p><i>Note</i> The <i>Common right</i> is not a so-called common property in for example the Anglo-American legal tradition, which is a property acquired by e.g. husband and wife in common.²⁶</p>	
<p>Class <i>Real Property Right</i></p>	<p>Object A connection between two real properties</p>

²⁶ See e.g. Gifis (1984: 81-82) and Friedman, et al. (1984: 55).

<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • Right executed by the owner of a (i.e. dominant) real property in another (i.e. servient) real property. • Right executed on the whole real property or a part of the real property. • The right is transferred together with the real property when the property is sold or otherwise transferred. • The right can be beneficial or encumbering to ownership. 	
<p><i>Definition</i> Right executed by the owner of a real property (the dominant tenement) in another real property (the servient tenement), due to his ownership. The right is transferred together with the real property when the property is sold or otherwise transferred.</p> <p><i>Note</i> An example is a road on a part of land used for access by the owner(s) of another real property, i.e. a right of way.</p>	
<p>Class <i>Personal right</i></p>	<p>Object A connection between a person (not owner) and a real property</p>
<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • A right executed by a person other than the owner in a real property.²⁷ • The right to use or harvest the fruits/material of a real property, rent or lease the real property in whole or in part. • The right follows the real property when the property is sold or otherwise transferred. • The right can be beneficial or encumbering to ownership. 	
<p><i>Definition</i> Right executed by a person to use, harvest the fruits/material of, rent or lease the real property in whole or part, including the claim against a person. The right follow the property when it is sold or otherwise transferred.</p> <p><i>Note</i> A person might in theory belong to the property as an asset. However, this seems not to be the case today, since it would be the same as serfdom.²⁸</p>	
<p>Class</p>	<p>Object</p>

²⁷ The person in not the same person as the one defined in the *Person* class, i.e. the owner of the real property in question. The person might in this case have several characteristics in common with *Person*, but e.g. but not being allowed to own real property.

²⁸ Serfdom is the situation where a labourer is not free to move from the land on which he worked. It is part of the old feudal system and a serf were allowed to farm a part the lords estate land for his own benefit and give a part of the outcome the lord. A serf also had to work on the lord's land for a certain number of days without pay (Oxford 1995: 1322). Serfdom is not the same as slavery, where a person is owned by another person and has no direct connection to land.

<i>Latent right</i>	A connection between a latent right and a real property
<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • A latent right waiting to be executed on or by a real property. • Regulating the exploration of a real property by another real property or person. • When a real property is sold or otherwise transferred the right normally follows with it. • The right will be classified as a <i>Common Right</i>, <i>Real property right</i>, <i>Personal right</i>, <i>Public regulation</i> or <i>Public advantage</i> when executed, depending on its specific characteristics. • The right can be beneficial or encumbering to ownership. • The right does not contain security for payment and other financial interests, such as mortgage. These rights are placed in the <i>Lien</i> class, see below. 	
<p><i>Definition</i> A right which is not yet executed on a real property. Regulating the exploration of a real property by another real property or person. When the real property is sold or otherwise transferred the right normally follows with it. Liens are not considered latent rights.</p> <p><i>Note</i> When executed, a latent right will be classified as another right depending on its characteristics, e.g. a pre-emption right for a neighbour's real property. Another example is an expropriation situation where the government has given permission for expropriation, but the expropriating party has not fulfilled the procedure by seeking a court decision for taking possession.</p>	
<p>Class</p> <p><i>Lien</i></p>	<p>Object</p> <p>A connection between a financial right or interest that a creditor has and a real property²⁹</p>
<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • A legal right or interest that a creditor (person or real property) has in another's real property. • Lasting usually until a debt or duty that it secures is satisfied. • A latent, financial security for payment. • The real property is used as security for payment and can be subject for forced sale. • When executed, the <i>Lien</i> will be transferred to <i>Personal right</i> or <i>Real property right</i> depending on the type of creditor. • The right can be beneficial or encumbering to ownership. 	

²⁹ Based on Black (2004: 766).

<p><i>Definition</i> A latent, financial security for payment.</p> <p><i>Note</i> An example is mortgage, which is a financial security granted by an owner of a real property to a person, normally a financial institution. <i>Lien</i> is a <i>Latent right</i> by nature, but is here classified as a separate class for pedagogic reasons. Friedman, et al. (1984:155) states that <i>Lien</i> is a type of encumbrance, but is here classified as being either beneficial or encumbering.</p>	
<p>Class <i>Public regulation</i></p>	<p>Object A connection between a public imposed regulation and a real property</p>
<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • Publicly imposed burden. • Encumbering to ownership and use of real property. 	
<p><i>Definition</i> Legally imposed burden by an official organisation.</p> <p><i>Example</i> A municipal zoning plan regulating the use of real properties located within a specific area.</p>	
<p>Class <i>Public advantage</i></p>	<p>Object A connection between a beneficial public imposed regulation and a real property</p>
<p><i>Characteristics</i></p> <ul style="list-style-type: none"> • Publicly imposed advantage. • Beneficial to ownership and use of real property. 	
<p><i>Definition</i> Publicly imposed advantage which is beneficial to ownership and use of real property.</p> <p><i>Note</i> A dispensation from an existing regulation, e.g. a zoning plan, benefiting the real property when compared with the original regulation which is still regulating the neighbouring areas.</p>	

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Modelling Legal and Administrative Cadastral Domain: Implementation in the Portuguese Legal Framework

JOÃO P HESPAÑHA,* MÓNICA JARDIM,** JESPER PAASCH,***
AND JAAP ZEVENBERGEN****

Research concerning the classification and modelling of rights, restrictions, and responsibilities related to real property based on a systems approach within the domain of land registration and cadastre commenced with the Core Cadastral Domain Model (CCDM) initiative in 2002. That model has been renamed the Land Administration Domain Model (LADM), having at its core a conceptual model of the relationship of persons (natural, non-natural or group) to registered objects through rights, restrictions, and responsibilities. This basic relationship is assumed to be applicable to land registration and cadastral systems throughout the world. In fact, LADM has gathered support from such international organizations as OGC, ISO/TC211, UN-Habitat and EU-Inspire.¹ It is being discussed within the International Standards Organization (ISO) as Working Draft 19152 with a view to issuing a new international standard.²

The research leading to the original CCDM has been published through a series of papers concerning different modelling aspects, cumulating in two articles. One generic³ and one on the proposed implementation of the Portuguese Cadastre.⁴ This first implementation exercise, as well as a current (operational) implementation to the Icelandic

* Technology and Management Polytechnic School, Águeda, Portugal.

** Law Faculty, University of Coimbra, Portugal.

*** KTH Royal Institute of Technology, Sweden.

**** OTB Research Institute, Delft University of Technology, the Netherlands.

Note that LADM Class names are in bold italic typeface.

¹ P. Oosterom, C. Lemmen, T. Ingvarsson, P. Molen, H. Ploeger, W. Quak, J. Stoter, and J. Zevenbergen, "The Core Cadastral Domain Model", *Computers, Environment and Urban Systems*, XXX (2006), p. 627, at 629.

² ISO/TC211 (2008) "Working Draft 19152; Geographic Information – Land Administration Domain Model" www.iso.org online catalogue.

³ *Ibid.*

⁴ J. P. Hespanha, P. Oosterom, J. Zevenbergen, and G. P. Dias, "A Modular Standard for the Cadastral Domain: Application to the Portuguese Cadastre", *Computers, Environment and Urban Systems*, XXX (2006), p. 562.

Cadastre,⁵ both focused specially on the cadastral component (specifically, geometry and spatial topology of surveying and mapping objects, especially parcels).

Such implementations, together with the early versions of CCDM, did little to elaborate the Legal/Administrative modelling package.⁶

A comprehensive modelling of the Legal and Administrative components is, however, essential to achieve a sufficiently generic data model able to support legal security of tenure, one of the LADM aims. An initial proposal for the classification of real rights under these modelling efforts⁷ forms the basic premise of this article.

Implementation in the Portuguese cadastral and land registration systems is particularly relevant pursuant to policies recently formulated in legislation and government directives (D.L. 224/2007, RCM 45/2006).⁸

The primary concern is the existing and proposed classifications of real rights, where the classification proposed by Paasch will be juxtaposed with other classifications, namely, those existing in Portuguese legal doctrine. In Paasch's paper a different view of the core relationship presented in LADM is proposed, namely considering ownership to be a fundamental right in replacement of the LADM "Right, Restriction or Responsibility" main class. Another difference concerns the LADM's *SpatialUnit*, which is simply called "Land", with the meaning of immovable property.

In this article, a wider concept regarding the object of real rights will be used that includes immovable property and also registered movable goods.⁹ The proposed classification does not form a closed and completely defined system however, as Paasch states that both personal and land main classes can relate to other types of rights and restrictions besides ownership. This same view is expressed in Zevenbergen.¹⁰

Real rights will be addressed in this article together with other forms of property in Portuguese legislation, including some forms of restrictions originating in private and public law. The complete set of rights, responsibilities and restrictions/regulations as defined in LADM is also included in Paasch's classification, although different terminology is sometimes used.

As regards terminology, and as referred to elsewhere,¹¹ clarification is crucial for scientific research, namely when the objectives of such research focus on real estate, where terminology is defined in national laws. This must take into account the fact that LADM is now an international standardisation effort intended to facilitate cross-border transactions,¹² stressing even further the need to clarify terminology.

⁵ T. M. Ingvarsson, "CCDM and Open Source Applications" (2006) (MSc Thesis TUDelft).

⁶ J. Zevenbergen, "Expanding the Legal/Administrative Package of the Cadastral Domain Model – from Grey to Yellow?" in P. Oosterom, C. Schlieder, J. Zevenbergen, C. Hess, C. Lemmen, and E. Fendel (eds.), *Standardization in the Cadastral Domain* (2d ed., 2005), p. 139.

⁷ Id; see also J. M. Paasch, "Legal Cadastral Domain Model – An Object-oriented Approach", *Nordic Journal of Surveying and Real Estate Research*, II (2005), p. 117.

⁸ D.L. 224/2007: General and Conceptual Principles of SINERGIC. RCM 45/2006: Council of Ministries Resolution launching the SINERGIC project for the implementation of a National Information System for the Cadastre.

⁹ In Portugal different services of the Ministry of Justice register real estate, vehicles, aircraft, and ships.

¹⁰ Zevenbergen, note 6 above, p. 139.

¹¹ A. U. Frank, "Comparing European Cadastres – Methodological Questions" in Oosterom, et al., note 6 above, p. 1.

¹² J. M. Paasch, "Standardization within the Legal Domain: A Terminological Approach", *Euras Yearbook of Standardization*, VI (2008), pp. 105-130.

A complete set of definitions will be given of the rights and regulations discussed, together with possible equivalent terms in English¹³ and other languages. The remainder of this article will set out a summary of the classification schemas for legal/administrative components of LADM previously proposed by two of the co-authors (Paasch, Zevenbergen) and present a framework for definitions of real rights as considered in modern Portuguese legal doctrine. Following definitions of the positive side of real rights, the negative side (encompassing regulations and other types of restrictions) will be considered. A number of public regulations and the common form of property known in Portugal as the “Baldios” will complete the set of definitions in Portuguese legislation.

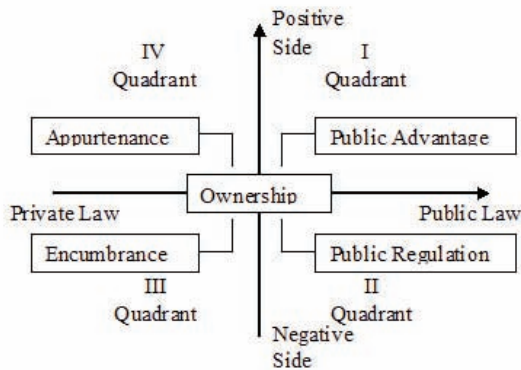
Based on the analysis of the legal and administrative components, a proposed implementation scheme is suggested which will include a number of UML class diagrams and object diagrams depicting specific relationships between the core cadastral classes of persons, rights and real estate objects, together with an overall class diagram of the proposed Portuguese implementation of LADM.

The final section draws conclusions from this research and sets out recommendations for future work.

LEGAL AND ADMINISTRATIVE COMPONENT CLASSIFICATION SCHEMES

Classification here concerns a more logical arrangement of property and estates, abbreviated as real rights, which is common in Portuguese doctrine. This systematization is also useful when considering an object-oriented modelling approach as exemplified in the LADM Legal Model.

The first classification scheme represents a conceptual view centred on ownership-related rights derived from Paasch.



The concept proposed corresponds to a two-axis classification scheme, with the xx axis representing two main branches of law, whereas the yy axis represents a concept

¹³ B. A. Garner, *Black's Law Dictionary* (8th ed, 2004).

traditionally related to the field of rights in real estate. In this concept, the positive side of real rights concerns the powers granted by each right, whereas the negative side of real rights concerns restrictions and responsibilities imposed by each right. The point of origin of this classification scheme is the right of ownership.

The main classes concerning private law are elaborated by Paasch in five different kinds of specialized rights, namely: common right; real property right; personal right; latent right, and lien. Most of these classes of rights can be directly related to a (land) parcel object associated with a corresponding *Recorded Object* of LADM, but they can also be related to other classes of land-related objects.

When examining specialized rights classes above, another difference between the Paasch legal model and LADM becomes evident: the *mortgage* is no longer an independent class related to a right (as in LADM), but merely one possible instance of the lien specialized class.

The question arises from the administratively-imposed zoning and regulations, which fit into public advantage and public regulation classes: should these advantages and regulations be related to individual parcel objects, or to other type of real estate object? Or even considered apart from the LADM, in a new but related domain?

In the following sub-paragraphs a brief definition of specialized rights classes based on the Paasch legal classes¹⁴ is presented. The full classification of Portuguese real rights under this scheme is given below:

- common rights: where ownership creates a common right in land not related to the owners. The right belongs to the real property and follows along the property in the event of a transaction. Common parts related to horizontal property¹⁵ are a good Portuguese example;
- real property rights: right executed by the owner of real property (the dominant tenement) in another real property (the servient tenement) arising from his ownership. The right is transferred together with the real property when the property is sold or otherwise alienated. The Portuguese cadastre ASP¹⁶ as a specialized land parcel class is a clear example of this type of right;
- personal rights: a right created by a person to use, harvest the fruits/material of, rent or lease the real property in whole or part, including the claim against a person. The right follows the property when it is sold or otherwise alienated. The *right of use and habitation* is a right derived from ownership (a right of enjoyment, see table 1) and is one example of a Portuguese personal real right;
- personal rights as personal servitudes: according to Portuguese legal doctrine, and also other countries having the Roman law tradition, a personal servitude is considered to be a contract between two individuals and not a real right. However, it fits into the concept defined above;
- latent rights: A right which is not yet created in a real property. Regulating the exploration of real property by another real property or person. When the real property is sold or otherwise alienated, the right normally follows. Liens are not

¹⁴ Paasch (2008) at Appendix.

¹⁵ Horizontal Property Right is explained on section 3.2.4.

¹⁶ ASP, *Área Social de Prédio*, is identified within each Parcel, representing e.g. an access easement.

considered latent rights. This is the domain of pre-emption rights¹⁷ (*preferência* in Portuguese law), namely the preliminary contract,¹⁸ where some kind of execution is deferred in time;

- *lien*: is equal to security of payment. An economic and financial right which can be created in real property and thereby regulates ownership. This type of right is better represented by a mortgage (*hipoteca* in Portuguese law) and is typically related to a land parcel object, but can also be related to a part of a parcel.

As mentioned in the personal servitudes example, the Roman law tradition distinguishes two different branches of law within the personal right class. The use and habitation is a real right of enjoyment, where the common set of attributes characterizing real rights applies (see below). But the personal servitude, not being a real right, falls under the law of contracts. This distinction will have further implications in modelling.

As regards public law, the class of public regulations can include planning regulations defined by municipal master plan zoning or by other kinds of zoning regulations defined state-wide, such as agricultural or ecological reserves. There are a number of possible examples in Portuguese land administration policies, which in turn represent (sometimes) an adoption of European Union regulations.

Completing this brief introduction is a table summarizing the Portuguese classification of real rights based on Fernandes.¹⁹

1 st order classification	Name of Right (Portuguese, with English translation)	Observations and sub-classification (Zevenbergen, 2004)
Gozo (Right of Joy)	<i>Propriedade</i> / Ownership	Maximum real right type A
	<i>Compropriedade</i> / Co-ownership	
	<i>Comunhão</i> / Joint-ownership	
	<i>Propriedade Horizontal</i> / Horizontal Property	
	<i>Usufruto</i> / Usufruct	Derived rights; type B
	<i>Uso e Habitação</i> / Use and Habitation	(according Zevenbergen's Classification)
	<i>Superfície</i> / Superficies	
	<i>Habitação Periódica</i> / Time Sharing	More recent right in PT legislation
	<i>Servidões Prediais</i> / Praedial Servitudes	Minor rights; type C ¹
Garantia (Security)	<i>Hipoteca</i> / Mortgage	Type D or Security Rights
	<i>Retenção</i> / Retention	
	<i>Consignação de Rendimento</i> / Pledge of Receivables	

¹⁷ Pre-emption, a term with different legal meanings; in this document refers to the right to buy a property before anyone else.

¹⁸ Effective against third persons.

¹⁹ L. A. C. Fernandes, "Lições de Direitos Reais", *Quid Juris?* (4th ed.; 2005), p. 17.

<i>Aquisição</i> (Acquisition)	<i>Previlégios Creditórios / Privileges</i>	Polemic categorization. ²
	<i>Contrato-Promessa / Preliminary Contract</i>	
	<i>Preferência / Pre-Emption</i>	

- 1 There is no clear distinction between type B (derived rights) and type C (minor rights) in Portuguese legal doctrine.
- 2 There is no agreed classification of such rights as a special class of real rights in Portuguese legal doctrine.

Table 1- Portuguese Classification of Real Rights

Real rights included above will be defined in more detail in the following section.

A word about the classification of real rights in Zevenbergen, which follows more closely current classifications in Portuguese doctrine and, as such, has been used to prepare the Table 1.

The Zevenbergen classification is as follows (with subpoint (e) added):

- (a) Maximum real right: the strongest right available in a jurisdiction, called e.g. ownership, freehold or property. In Portugal the best match is perfect property, and the definition is in the next section;
- (b) Derived rights: from the previous category where the holder of this derived right is allowed to use the land in its totality²⁰ (often within the confines of a certain land use type);
- (c) Minor rights: allow the holder some minor use of someone else’s land, e.g. walking over the land to a road. Such rights can be called servitude or easement and also may include the right to prevent certain activities or construction on some nearby land, e.g. freedom of view;²¹
- (d) Security rights: rights whereby certain previously mentioned rights can be used as collateral, mainly for bank loans in the form of a mortgage or lien.
- (e) Acquisition rights: rights having as their object immovable property, to distinguish them from personal acquisition rights, and legally effective as a means of the acquisition of other real rights, namely ownership. This includes pre-emption rights.

LIST OF PORTUGUESE REAL RIGHTS

The first general definition of real rights and its position in Portuguese legal doctrine is as follows. A number of sub-sections ensue based on the classification scheme of Zevenbergen (extended).

²⁰ Totality here does not mean that the right covers the whole property, as can be seen by the sentence within brackets.

²¹ Freedom of view, according Portuguese doctrine, is a restriction imposed on a property right, and as such should not be considered a real right.

General Definitions

Real rights are studied on a casuistic base (through an analysis of specific real rights and concrete situations) which have as object matter (within the realm of legal doctrine) the right to a thing. The right to a thing is a component of private law that has been codified in the Civil law. The reason for calling these kinds of rights “real” derives from the Latin word for things: “res”, which in English has been translated as “real”.

Real rights in Portugal historically evolved from Roman law (*actio in rem*) to the medieval concept of *ius in re* and then to the modern Civil Code, in which two periods can be identified: French influence (nineteenth century) and Germanic influence (twentieth century up to the present time).

A general definition of real rights is given by Mesquita:²²

A juridical relationship through which a thing²³ comes within the domain or under the sovereignty of a person²⁴ according to a certain statute which confers powers but also contains restrictions and obligations.

This definition, as can be perceived in the footnotes, is broader than the usual cadastral domain since it encompasses movable goods not considered to be real estate.

The above definition, not surprisingly, reflects the LADM Core when real rights are defined as a relationship between a corporeal thing (e.g. real estate) and a person (e.g. an individual). It seems to focus on the corporeal thing component as a consequence of the necessity to differentiate real rights from personal rights.

A real right thus has an object (the corporeal thing) and a subject (the person). The object of the real right can be defined as:²⁵

An existing, well determined corporeal thing, which determination should be effective for the creation and acquisition of the real right. Ownership covers the whole object, but certain real rights, e.g. superficies, can apply to part thereof.

Finally, a common set of attributes pertaining to real rights as a whole are as follows:

- real rights are *inherent* in the object of the right (the corporeal thing);
- *sequel*: power granted to the titular of a real right to exercise his right wherever the thing is²⁶ or against a third person illegally possessing the thing;
- a titular of a security right has a *preference* to receive his credit over any third persons not possessing a prior security right;
- the current juridical status of the corporeal thing should be subject to a *numerus clausus*;²⁷
- the current juridical status of the corporeal thing must be *publicized* to interested third persons.

²² M. H. Mesquita, *Obrigações Reais e Ónus Reais* (1990).

²³ A corporeal thing is in this sense any movable or immovable good which can be registered.

²⁴ A person can be any individual (natural) or collective (non-natural) person.

²⁵ Fernandes, note 19 above, p. 56.

²⁶ Consider a thing defined as in note 25 above.

²⁷ Limited number of legally pre-defined real rights.

Type A: Maximum Real Rights

In Portuguese legislation, a number of classical and modern real rights fall into this classification. The term “ownership” was avoided because this term can be identified with “the bundle of rights allowing one to use, manage and enjoy property, including the right to convey it to others”.²⁸

In this view ownership refers to the complete set of real rights which applies to a given property.

All rights described in this section are defined solely with respect to their *positive* side. Definitions were extracted from Fernandes, unless referenced otherwise. We begin with *possession*, although arguably possession should qualify as a real right. According to *Black’s Law Dictionary* possession is:²⁹ “the exercise of dominion over property”. Possession is the power a subject exerts as though he had title to real rights of enjoyment (Types A, B or C in Table 1).

If he does not have such title,³⁰ the law can nonetheless recognize a “de facto” situation, what is called *formal possession*. Following such recognition, and provided that all conditions regarding *usucapio* apply, the possessor becomes a titular of the real right of *usucapio*. From that moment, he could register one or more real rights of types A, B or C as above, this being the reason to not include formal possession as a Type A real right.

Property

This is the fundamental real right,³¹ from which a number of other real rights, here classified as minor and derivative, are formed. The titular of such right can fully enjoy the use of the (corporeal) thing, satisfying his legitimate needs, within legal limits and observing legally imposed restrictions. Two variants to this right concerning the composition of the subject are presented next.

Co-Property

The English term is ownership in common:³² “ownership shared by two or more persons whose interests are divisible”. This is a property right having as its object an immovable thing as a whole but shared by several subjects. The law recognizes three different ways of exerting power under a co-property right: in isolation, by majority decision, and unanimously. Parties may dispose their fractions or ask for division of the thing.³³

²⁸ Garner, note 13 above, p. 1138.

²⁹ *Ibid.*, p. 1201.

³⁰ Title here means a valid legal transaction, not necessarily a registered right.

³¹ Classified as the maximum enjoyment real right in Portuguese doctrine.

³² Garner, note 13 above, p. 1138.

³³ The Latin term is *communio pro diviso*.

Joint Property

The English term is joint ownership:³⁴ “undivided ownership shared by two or more persons”. Only one indivisible property right is shared by the joint owners quantitatively related to the right as a whole. Parties may not dispose of their fractions or ask for division of the thing.

Horizontal Property

The English term is condominium:³⁵ “single real estate unit in a multi-unit development in which a person has both separate ownership of a unit and a common interest”. This set of powers has as its object an autonomous fraction of an urban building and some common parts of the building (**Building Unit** objects in LADM). The common parts recognized by law concern the projected right on the soil, structural elements, common equipment and its installation areas and internal common circulation areas. Other areas can be defined in the title as common. This is a relatively recent form of Type A real rights, with some unique features regarding the classical property right, namely the mandatory existence of common parts. Another aspect concerns its representation within the cadastre geometric component, once it requires a three dimensional (3D) shape definition.

With regard to the allowed sharing of real rights in spatial and temporal dimensions, the following table tries to summarize comments so far:

Sharing Type	Real Right	Type (Zevenbergen)	Obligations
No sharing of space No share in time	Property (Ownership)	A	Neighbourhood restrictions apply
No share in space Share in time	Time Sharing	B	D.L. 275/93, ¹ Article 21
	Succession Usufruct	B	Maintain economic use
Share in space No share in time	Co-Property	A	Rights are self-limiting
Share in space Share in time	Time Sharing ² (as Personal Right)	Not defined	Not subject to registry

1 D.L. 275/93 defines the time-share real right.

2 A special type of time-share governed by contract law and representing thus a personal right.

Table 2 - Spatial-temporal sharing of real rights

The sharing in time and space above concerns an individual property unit. The last type is rare and not legally recognized, although a valid conceptual hypothesis.

³⁴ Garner, note 13 above, p. 1138.

³⁵ Garner, note 13 above, p. 314.

Type B: Derivative Rights

Usufruct

The English definition according to Garner is:³⁶ “Right to use and enjoy the fruits of another’s property for a period, without damaging or diminishing it”. This is the right to fully enjoy another’s thing or right, limited in time. Its object can be a corporeal thing (e.g. an immovable) or a right. As *ius in re aliena* this is a derivative right considered to be a personal right by Paasch, which is in consistent with Portuguese doctrine.³⁷ It is not an exclusive right, and co-exists with a basic property right.

Use and Habitation

The English definitions according to Garner are:³⁸ “A long-continued possession and employment of a thing for the purpose for which is adapted (Use); non-transferable and non-heritable right to dwell in the house of another (Habitation)”. This is the right to use a determined thing on another’s property and have its respective fruits, as needed by the titular and his family. This right is called habitation when the object is a residential building.

Superficies

The English definition is:³⁹ “Personal, hereditary and alienable right to a building, subject to payment of an annual rent”. A relatively recent real right under Portuguese law, this right offers an alternative to the abolished right of emphyteusis. It confers the power to build or maintain a structure or planting on another’s parcel, which is called the *implante*. The subject of such right is the superficiarius and the owner of the soil is the *fundeiro*. The duration of the right, defined in the title; may be temporary or perpetual. The superficiarius can (optionally) pay an annual rent to the *fundeiro*.

Time Sharing

The English definition is:⁴⁰ “Joint ownership by several persons who take turns occupying the property”. This is the right to use, for one fixed time period (from 7 to 30 days), a habitation unit integrated into a tourist enterprise, against the payment of an annual fee. This is an example of a new type of real right introduced by Portuguese legislation in 1981. It is arguable whether this should be considered a Type A real right because the owner of the tourist enterprise possesses superior rights over the building (or set of buildings) as a whole.

³⁶ Garner, note 13 above, p. 1580.

³⁷ Once it was considered to be a real personal right and not a personal right under the law of contract.

³⁸ Garner, note 13 above, pp. 1577 and 729.

³⁹ Garner, note 13 above, p. 1478.

⁴⁰ *Ibid.*, p. 1521.

This type of right can be best described in a cadastre by some form of four dimensional (4D) representation, so as to correctly situate the object of the right both in space (3D) and in time (as a recurring event).

Type C: Minor Rights

Just one Type C real right is defined here, the Praedial Servitude, which has a vast number of modalities identifiable in law. Some are presented below. The English definition considering this to be a positive right or *servitude appurtenant*:⁴¹ “the right of using one piece of land for the benefit of another”.

Praedial Servitude

Defined as a positive right, this is a real right over another’s property, in which an owner of a parcel (“*praedium dominans*”) has the right to use certain facilities of another’s parcel (servient property), contributing to the full use and benefit of his parcel. If the subject of such right is not the owner in title, then we do not have a real right, rather a *personal servitude*. A praedial servitude is not divisible; for example, when the servient property is split the praedial servitude is maintained, affecting each of the split parcels. This real right does not conform to the common attribute of juridical types because the content of the right is open to definition in the corresponding title. We consider some of the modalities specified in the law.

Legal Servitude

Servitudes created according certain predicted legal situations, entering in operation as a result of a court decision or administrative act. Examples of legal servitudes include:

- *Enclosed Estate*: a servitude is created for those parcels without communication with public ways (Civil Code, Art.º 1550º);
- *Water Easement*: allowing owners who do not have access to a public water source or stream to cross someone’s land for that purpose (Civil Code, Art.º 1556º);
- *Rural Irrigation*: an owner which does not possess water for irrigation (except with great effort and cost) can use the water from a neighbouring parcel (if left without use), against payment of a fair price (Civil Code, Art.º 1558º);
- *Aqueductus*: right to conduct water through someone’s land, be it underground or across the surface, provided the beneficiary indemnifies the owner of servient properties (Civil Code, Art. º 1561º).

All legal servitudes imply payment of a fair indemnification to servient parcel owners. The last three types are classified as rural servitudes in *Black’s Law Dictionary*.

⁴¹ Ibid. p. 1400.

Servitude of View

Created by contract or *usucapio*, this servitude gives the owner of such servitude the right to overcome a restriction of view, thus allowing him to open doors, windows or balconies in a newly constructed building up to the parcel boundary.

Servitude of Drip

Barely used today, this servitude is called *Servidão de Estilicídio* in the Civil Code (Art. ^o 1365^o). The titular has the right to overcome the restriction of drip, which states that rain waters falling on its parcel can not drip or drain onto a neighbour parcel. As above, it can be created by contract or *usucapio*.

Access Easement

A servitude which allows one or more persons to travel across another's land to get to a nearby location, such as a road.⁴² Black's definition perfectly applies to Portugal; this being perhaps the best-known praedial servitude.

Type D: Security Rights

Mortgage

The creditor's right to take advantage of his credit and respective interests by using the value of an immovable and certain movable things (Civil Code, Art. ^o 688^o). He has preference over other creditors which have no special privileges or priority in registration. Registration is mandatory for a mortgage. Until the 1984 revision of the Real Estate Code, this was one of the few mandatory reasons for registration in the Portuguese Land Register.⁴³

Retention

The English definition is:⁴⁴ "A possessor's right to keep a movable until the possessor's claim against the movable or its owner is satisfied".

This is the debtor's right to maintain a thing in his possession against a creditor, provided that in turn he has a credit against the creditor, e.g. the transporters right to retain transported goods if the transport is not paid (Civil Code, Articles 754^o to 760^o). This right may be applied to immovable or movable things (thus differing from the English definition). If the thing is an immovable, exercise of this right follows the same procedure as a mortgage.

⁴² Garner, note 13 above, p. 548.

⁴³ I. P. Mendes, *Código do Registo Predial – Anotado e Comentado com Formulário* (13th ed.; 2003). After 1984, the legal regime of indirect obligation to register was created. With a few exceptions, all transactions involving the transfer of rights or creation of a credit against immovable property must be registered.

⁴⁴ Garner, note 13 above, p. 1342.

Retention rights arise automatically from the law, provided that the requisites defined in legislation are satisfied. In such cases registration is not mandatory.

Pledge of Receivables

Also known as *anticrese* (an ancient Greek term), this refers to revenues generated by the economic exploitation of a parcel in order to perform an obligation and respective interests. It can be effective for a maximum period of 15 years (Civil Code, Art^o 659^o).

Privileges

This type of right is not registered at the land register. The credit is created in favour of public entities, such as State or municipalities (becoming thus creditors). These are not considered to be a real right; however they are considered here because these could seriously affect property transactions and, thus, transmission of real rights.

Type E: Acquisition Rights

This type of right can be considered to be real rights provided the object thereof is an immovable and these rights have legal (real) effectiveness.

Pre-Emption Rights

These may arise from a law, as is the case of co-property. The holder of a real pre-emption right may acquire the ownership of an immovable for a contracted price, over other eventual interested buyers, provided he does this within a certain time limit.

Preliminary Contract

Some considerations concerning validity as a real right apply here. Such a contract must be valid and in force. The content of the actual document (title) depends on the nature of the goods being transacted. Registration makes this right legally effective, namely against any third person intending to acquire the same thing.

NEGATIVE SIDE OF REAL RIGHTS: ENCUMBRANCES AND PUBLIC REGULATIONS

Ownership rights are no longer considered to be absolute types of rights to use and enjoy a corporeal thing, as defined in the first French Civil Code. The Portuguese constitution has a number of articles (Articles 61^o, 81^o, 88^o, 93^o and 100^o) which imply that the general interest prevails over private property under a number of circumstances. Such limitations contribute to the so-called *social function* of private property.⁴⁵

⁴⁵ Fernandes, note 19 above, p. 196; also see A. Dinis, E. Henriques, and M. I. Contreiras, *Direito* (1987).

In private law certain restrictions on real rights arise from neighbourhood relationships between owners in order to prevent conflicts. In such cases the contiguity between parcels imposes certain limitations on completely independent use.⁴⁶

Public and private restrictions on the full use of real rights will be examined next.

Public Regulations

The aims of public regulations are diverse. They may relate to national defence, land policy, ecological sustainability or free circulation of goods and persons, to name just a few. Three principal juridical institutions governing the application of public regulations will be identified: expropriation, requisition, and administrative servitudes. Administrative public regulations defined in the next section fall also into the II Quadrant (Public Law, Negative side).

Expropriation

The English definition is:⁴⁷ “A governmental taking or modification of an individual’s property rights, especially by eminent domain”.

Such a taking is regulated by the expropriation code (Law 168/99,⁴⁸ amended by Law 13/2002). The State has the right to the compulsory acquisition of the object of the real right provided there is compliance with the demands of the public utility. This should only happen when other means of acquisition (e.g. via private law) are not feasible. The taking should be preceded by a public utility declaration.

Requisition

The English definition is:⁴⁹ “A governmental seizure of property”. This is an administrative act through which a property owner (upon receiving indemnification) has to consent to the temporary use of its property in order to allow fulfilment of the public interest. It is limited in time to a maximum duration of 1 year.

Administrative Servitudes

The English term providing the closest match is public servitude:⁵⁰ “Servitude vested in the public at large or in some class of indeterminate individuals. Examples: the right of the public to a highway over privately owned land”. This is the right, conferred by public law, to use certain utilities of a private property to the benefit of a praedium dominans under the previous declaration of public utility. There are a vast number of such servitudes regulated in the law, majority of which are listed in by-law N^o 1101/2000. A few examples:

- Geological resource exploration servitudes (D.L. 90/90);

⁴⁶ Fernandes, note 19 above, p. 208.

⁴⁷ Garner, note 13 above, p. 621.

⁴⁸ Law 168/99 defines expropriation by public utility.

⁴⁹ Garner, note 13 above, p. 1332.

⁵⁰ *Ibid.*, p. 1401.

- Raw petrol extraction servitude (D.L. 109/94);
- High voltage power lines servitude (R.D. 1/92).

It must be stressed that the example given for the Anglo-American public servitude hardly classifies as an administrative servitude in Portugal because public roads (national or municipal) are public domain acquired through expropriations.

Encumbrances

The limitations on real rights defined in private law have two origins: Neighbourhood relationships and superimposition of real rights (this last subject is not treated here).

Neighborhood Relationships

Limitations arising from the contiguity or proximity between parcels, such as the exercise of real rights on a particular parcel, can affect the titular of real rights of neighbouring parcels. There are a great number of such limitations identified in law. Restriction of view⁵¹ can be considered to be a neighbourhood imposed limitation.

As a result of the diverse relationships that can arise in the terrain (reflecting “de facto” situations), such limitations should be considered on a case by case basis. The following is a classification of limitations originating in neighbourhood relationships which exist in current law.⁵² The list is far from exhaustive.

- *Emissions*: there are different types of emissions (gaseous, noise, vibrations or even heat) which can cause substantial prejudice to neighbouring parcels and are thus prohibited. The neighbourhood here does not mean necessarily contiguity, but rather a nearby area substantially affected by such emissions;
- *Hazardous Installations*: These concern construction, equipment or storage facilities containing corrosive or dangerous substances which can pose a danger to neighbouring parcels. If such installations received a permit and even so a serious accident occurs, the installations must be dismantled.
- *Construction*: these relate to the servitudes of view and drip mentioned above;
- *Plantations*: These concern those near or at a parcel’s boundaries. Certain tree species, such as eucalyptus, are prohibited if neighbouring parcels are used for cultivation or are urban. The neighbours (owners) can demand that the roots or branches which extend over their parcels be cut. An exception is when such trees or bushes are used as beacons (Civil Code, Art.º 1369º);
- *Natural Waters Drainage*: Owners of parcels traversed by a natural stream should not build any kind of equipment retaining or otherwise facilitating water flow that would prejudice neighbouring (contiguous) parcels.

Other types not described here cover the use of a neighbouring parcel; water defensive works; excavations; building ruins or demarcation.

⁵¹ Requires the owner to maintain an area inside its parcel having a minimum buffer of 1.5 m from the boundary (Civil Code, Art.º 1362º) where he cannot open doors, windows or balconies in a newly constructed building with views towards the neighbouring parcel.

⁵² Fernandes, note 19 above, p. 209.

ADMINISTRATIVE PUBLIC REGULATIONS

In order to implement land-related policies aiming at sustainable socio-economic development, where environmental concerns receive each day more attention, the State imposes a series of regulations. These are spatially represented as zoning areas affecting privately owned land, and also parcels under public domain (some acquired through expropriation).

Public regulations implemented as zoning areas are defined and managed at several levels of administration (national, regional or local) and in different sectors of governmental activity (agriculture, environment, public works, energy or telecommunications). Together they form an intricate and complex puzzle of superimposed zoning areas, difficult to manage because of (among other factors) intense process fragmentation⁵³ and lack of coordination.

Some of these zoning regulations are described below. The actual list is much longer.

National Agricultural Reserve

The Portuguese acronym is RAN. It is regulated by law (D.L. 196/89) and directed towards defending and protecting areas with good promise for agriculture, guaranteeing their proper use so that a genuine contribution will be made to the full development of Portuguese agriculture and to effective land administration.⁵⁴

Such a reserve is defined at the regional level by services of the Ministry of Agriculture and should be adapted locally to each municipality's Master Plan. This confers on owners of parcels under RAN certain real rights, e.g. pre-emption rights to acquire neighbouring parcels also under RAN, and gives such owners special financial incentives. The cultivation unit doubles under RAN, with implications for eventual parcelling out on these areas.

National Ecological Reserve

The Portuguese acronym is REN. Such a reserve is regulated by law (D.L. 93/90) and is intended for the protection of ecosystems and the preservation and development of biological processes fundamental to achieving equilibrium with human activities.⁵⁵

The following land cover and geomorphologic types are considered for inclusion in REN zones (the list is not exhaustive):

- Beaches;
- Coastal dune system;
- Sea cliffs;
- Estuaries, lagoons and marshes;
- Maximum rainwater infiltration areas in a catchment basin;
- Areas subject to river floods;

⁵³ A. Mulolwa, "Integrated Land Delivery: Towards Improving Land Administration in Zambia" (PhD Thesis TUDelft, 2002), p. 1.

⁵⁴ A. A. Delgado and A. M. C. Ribeiro, *Legislação de Direito do ordenamento do Território e do Urbanismo* (2nd ed.; 2004), p. 781.

⁵⁵ *Ibid.* p. 811.

- Escarpments and areas with high risk of erosion.

These have been criticized for the amount of area that they can cover in some municipalities (reaching more than 60% of municipal area).

Municipal Zoning

The general content was determined in the Land Policy law (Article⁹ 86⁹, D.L. 380/99),⁵⁶ which defines a set of regulations spatially based on a classification and qualification of lands based upon a distinction between urban and rural land.

The following table summarizes the legal qualification of lands.

Basic Classification	Qualification
Rural lands (includes RAN and REN zones)	Agricultural or forestry production spaces; Mining exploration spaces; Spaces affecting extractive and agro-industry; Natural spaces; Spaces for infrastructure or other human activities compatible with agricultural, forestry or natural spaces.
Urban lands	Urban soil; Soil reserved for planned urban development; Urban soils required for ecological sustainability.

Table 3 - Legal Qualification of Rural and Urban Lands

Public Waters Reservoirs

This type of zoning is regulated by legislation (R.D. 2/88). Water reservoirs used for public purposes such as irrigation, hydro-electrical energy or drinking water supply are protected through restrictions on activities occurring within the public domain and by the establishment of a protection zone around the contour line of full storage (a spatial buffer).

The protection buffer width varies according to the reservoir being classified as protected, conditioned, of limited use or of free use. Each classified reservoir must possess an administrative plan regulating activities in the public domain and protection zone. Presently, there are more than one hundred classified reservoirs (built or under construction).

Natural Protected Areas

This zoning, regulated by legislation (D.L. 19/93),⁵⁷ defines a national network of protected areas aimed at natural habitat fauna and flora preservation, among other objectives. Protected areas can be established at national or local levels according a classification defined by law.

⁵⁶ D.L. 380/99 defines the Executive Regime for Land Management Instruments.

⁵⁷ D.L. 19/93 defines the Classification of Natural Protected Areas.

Local level protected areas are called *protected landscape areas* and must be managed by municipalities or their associations. The creation of these areas is completed through a regulation which should define the uses of the land, such as prohibiting the introduction of exotic species of fauna or flora; certain types of construction works; industrial and mining activities, and the like.

Coastal Protection Zone

This is regulated by law (D.L. 302/90) and is spatially represented by a coastal buffer, delimited from the line of spring tide (equinox high tide) up to 2 km inland, where a number of national level regulations apply. Other local (municipal level) regulations must be compatible with national regulations. The following items are regulated within such zones: land use (especially urban soil); access to the coast line; infrastructures; buildings and green areas and shipyards.

Cultural Heritage

This is regulated by a law (Law 107/2001)⁵⁸ whose purpose is to protect and value the cultural heritage, which includes both material and intangible things contributing to the national identity and history. Immovable things can be classified as a monument, set, or place and be defined as being of national, public or municipal interest.

A protection zone 50 m wide is automatically established around the exterior outline of an immovable, upon classification. A further special protection zone, including *non aedificandi* areas, must be determined at State level. Such protection zones are in fact considered to be administrative servitudes.

OTHER FORMS OF PROPERTY

Public Domain

The English definition is:⁵⁹ “government owned land”. According to Portuguese law, the State itself, not the government, owns public domain lands. Different types of public domain exist managed by various State or local government organizations. A few examples are given below.⁶⁰ These areas are not subject to transactions because they cannot be privatised.⁶¹ However, government organizations can hand over the administration of such areas to private persons in the form of long leases.

⁵⁸ Law 107/2001 defines the Protection and Improvement Regime for the Cultural Heritage.

⁵⁹ Garner, note 13 above, p. 1265.

⁶⁰ Delgado, note 58 above, p. 585, referring public water reservoirs.

⁶¹ B. Azevedo, *Servidão de Direito Público – Contributo para o seu Estudo* (2005). This prohibition is also referred on the Civil Code, Article° 202°.

Public Water Domain

These are regulated by law (D.L. 468/71)⁶² and include maritime and inland waters superjacent to a riverbed or seabed, the water-covered surface and margins. The margins include a buffer 10 m wide for non-navigable streams and 50 m wide for sea waters or navigable streams. In rivers and streams the margins are defined by the principle of mean flood waters, usually at the top of the natural slope at the river bank.

Private ownership is only permitted within these areas if this was registered prior to 1892 (for historical reasons; Civil Code, Article^o 1386^o). In those cases administrative servitudes are imposed.

Public Municipal Domain

This is (partly) regulated in legislation (RJUE, D.L. 555/99).⁶³ Such domain includes a number of specific land uses administered by the municipality, namely, green areas, collective use areas, and equipment or the road infrastructure. The parameters determining the dimensions of parcels under municipal domain are contained in the Municipal Master Plan, which in turn should be consistent with the national and regional level directives.

In an urban lot operation, the administration of such areas can be granted to groups of neighbouring residents (unit owners) through a long lease.

Commons

The form of property usually referred as the “Commons” under the British tradition has deep roots in history preceding the institution of Roman law. Black’s definition is:⁶⁴ “Common appurtenant (historical): landowner’s right to graze animals on another’s land as result of a written grant relating to ownership or occupancy of land”.

The example of a common right cited by Paasch comes from Swedish law:⁶⁵ “... a common property unit (*samflighet*), where several real properties own a share in the common property unit ... if one of the shareholder properties is sold, the share in the common ownership right in the common real property unit automatically follows with the sale”.

These definitions fit into the common right concept from the appurtenance super-class, thus classifying as private property rights.

The Portuguese institution of the Commons, known as *Baldios*, grants ownership of such lands to public entities recognized in the Constitution as local communities.⁶⁶ The management of *Baldios* is mandated to locally-constituted commissions, according Law 68/93,⁶⁷ amended by Law 89/97.

⁶² D.L. 468/71 defines the legal regime of the public water domain.

⁶³ D.L. 555/99 defines the legal regime for urbanization and building (Portuguese initials: RJUE).

⁶⁴ Garner, note 13 above, p. 291.

⁶⁵ Paasch, note 12 above, pp. 128-129.

⁶⁶ A. Dinis, E. Henriques, and I. Contreiras, *Direito* (1987), p. 271.

⁶⁷ Law 68/93 is the Law of *Baldios*. This form of ownership has old roots and evolved from a customary right to a more elaborate legal regime recognized in the Portuguese Constitution.

The subject is the local community, usually the inhabitants of a single settlement. Customary law defines specifically which members of the local community should be shareholders of a *Baldio*. The object is communal land used and managed as such since time immemorial. Provided a qualified majority of shareholders agrees with modifications (together with other provisions established in Law), a *Baldio* or parts of it can be sold as private property, or the reverse (private lands can be integrated into a *Baldio*).

The concrete management and use of the land and resources in a *Baldio* is regulated by customary law or (in recent cases) by a use plan. A *Baldio* can be encumbered by both praedial servitudes from private law and administrative servitudes from public law.

The afore-mentioned specific aspects of this form of property justify its being modelled as a specialized category which is not included in the legal quadrants presented at the beginning of section 2.

LEGAL AND ADMINISTRATIVE MODELLING

A fairly comprehensive account of Portuguese real rights and of public and private restrictions has been outlined above. According its contents, they will be ascribed to specialized classes under the presented classification schema by Paasch, with some adaptations. Such classification will use as basic elements the ones belonging to UML class diagrams.

The set of real rights and public and private restrictions will be depicted in the following sections through class diagrams ordered by each of the previously defined quadrants, except for the first section dedicated to the ownership right as fundamental real right. It must be stressed, however, that following class diagrams represent only those rights usually recorded at the Land Register. Some of the rights discussed above do not figure here.

After the first set of class diagrams, focusing solely on the legal and administrative components, a number of specific object diagrams will depict relationships with instances of geometrical and person-specialized classes.

Specialized Ownership Right Class

On the first class diagram the principal legal types of (private) ownership, grouped previously as Type A Real Rights, are associated with the abstract main class of ownership right.

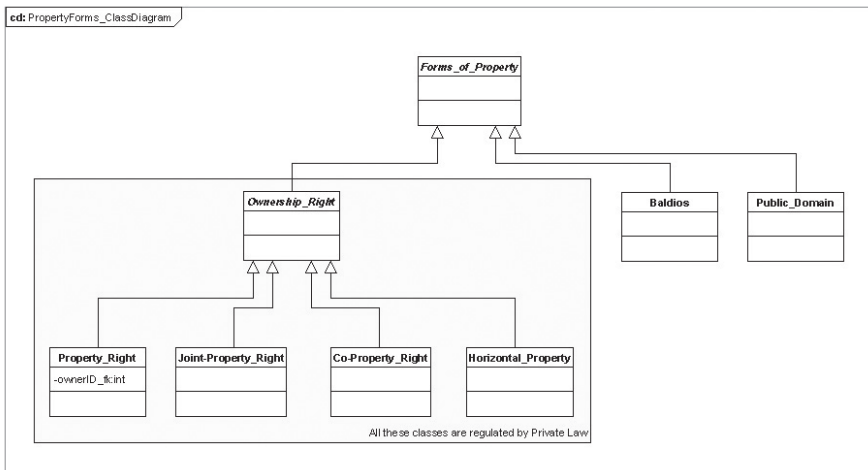


Figure 1- Ownership specializations

As depicted in the diagram, a high level abstract class *Forms_of_Property* represents the basic forms of property recognized in the Portuguese Constitution and law. The ownership right, as regulated by private law, is one of the three possible forms of property, whereas public domain is regulated by public law and *Baldios* is regulated by a specific law. Specialized classes under ownership include property, joint-property, co-property and horizontal property, as previously defined.

IV Quadrant (Private, Positive Real Rights) Specializations

The abstract class from which all the other derive is appurtenance, representing all positive real rights under private law. The following hierarchy represents classes according to the Paasch classification.

The final, more specialized level represents real rights as defined in Portuguese law classified according to the Paasch specialized classes.

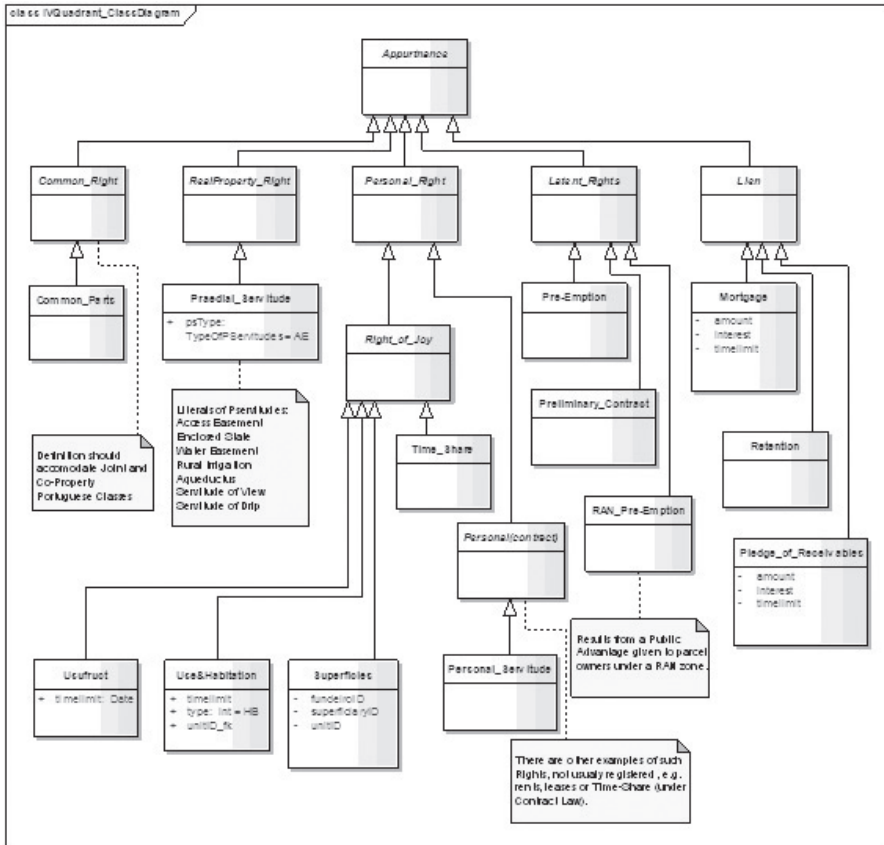


Figure 2 - Appurtenance specialization classes

Beginning with common right, the class common parts was created as specialized class, and represents the common interests hold by the owners of horizontal property on a same building. Only one specialization of real property right is presented, namely Praedial Servitude, but there are several different types included as comments in the UML diagram. As this is a IV Quadrant diagram, just the positive side should be recorded here, that is, the one related with the *Praedium dominans*.

The personal right has four specialized classes, namely usufruct, use and habitation, superficies and time share, as defined previously. The reason to depict them as distinct classes (and not identify them through a Type attribute) is their different nature concerning coverage (exerted on the whole parcel or in part), time limits, inheritance, or relations with the holder of ownership rights.

Three specialized classes were identified under latent rights, the first regarding pre-emption rights, the second a preliminary contract, and the third respecting a result from a public advantage under RAN regime (see above), also manifested as a different type of pre-emption right, called “RAN Pre-Emption”.

Under lien, a total of three specialisation classes were identified, previously defined as Type D real rights: mortgage, retention and pledge of receivables. These rights exhibit different characteristics which justify maintaining them as separate classes, namely, regarding the way they are recorded.

Two Object Diagrams below will show relationships of superficies and horizontal property real rights with other components of the LADM class diagram.

I Quadrant (Public, Positive Rights) Specializations

Land administration regulations are frequently seen as a burden imposed by the State on (private) ownership, but they should be considered as public regulations as defined by Paasch.⁶⁸ However, imposing certain types of zoning or even creating certain types of public domain in the vicinity of a privately owned parcel can be beneficial financially (through increased value) and legally (granting special rights to the owner).

The following diagram departs from the abstract class public advantage as defined by Paasch⁶⁹ and considers a series of specialized classes representing benefits to ownership rights granted by (land administration) zoning and public domain.

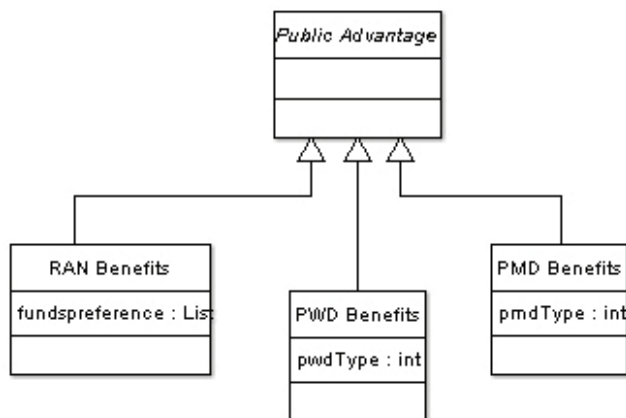


Figure 3 - Public Advantage specializations

RAN Benefits are those introduced by National Agriculture Reserve zoning, namely giving preference to some public funds to owners of parcels under RAN or granting pre-emption rights to acquire neighbouring parcels also under RAN. PWD Benefits are those introduced by proximity to a public water domain where several activities are allowed (water sports, tourism or recreation). Similarly, PMD Benefits are those introduced by proximity to a public municipal domain such as a municipal road with urban infrastructures as water distribution and sewage.

⁶⁸ Paasch, note 12 above, p. 130.

⁶⁹ Ibid.

II Quadrant (Public, Negative Rights) Specializations

The relevant class diagram depicts three main elements previously defined under public regulations. They are modelled as specializations of the abstract class public regulation. There are several differences contributing to definition as independent classes, notably regarding the fact that expropriation and requisition refer to administrative processes. The expropriation class refers to a temporary process which turns private lands into public domain, whereas requisition is by definition temporary (with duration fixed by law). An administrative servitude does not generally specify a time limit.

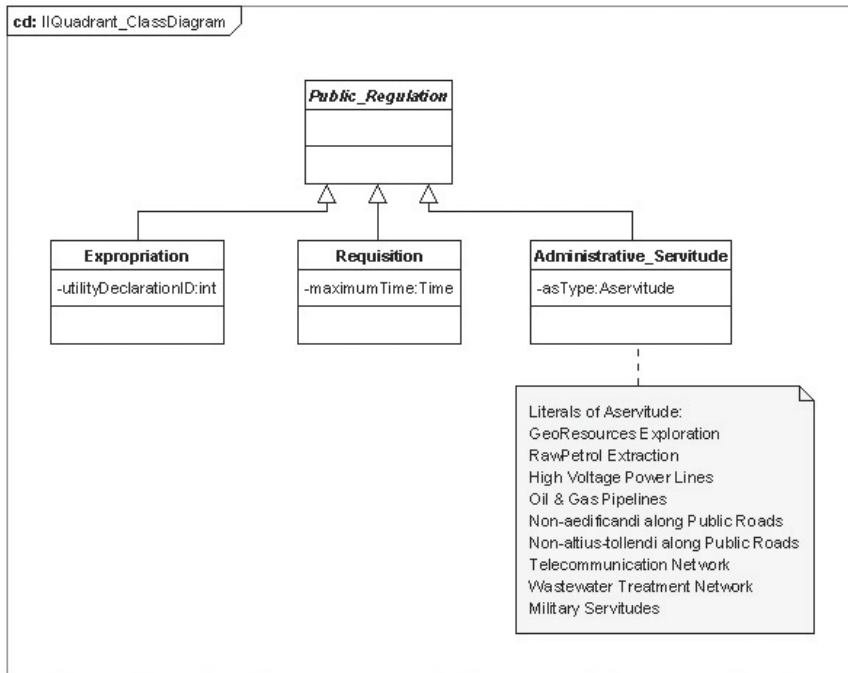


Figure 4 - Public Regulation specialization classes

The diagram shows a limited number of types of administrative servitude, as literals from the asType attribute.

The Object Diagram shows relationships of the expropriation class with other LADM objects.

Administrative public regulations are not shown in the diagram, although they should be considered as specialisations from the public regulation abstract class.

III Quadrant (Private, Negative Rights) Specializations

In general, specializations concern the abstract class of encumbrance and should correspond to the negative side of real (and also certain personal) rights already depicted in

Figure 2 above. As discussed elsewhere,⁷⁰ when registering such rights there is always the possibility to limit registration to the positive side of real rights (which type of powers are given to whom) or to the negative side (which type of restrictions encumbers each right). A third possibility is to register a mix of positive or negative side of rights, depending on the type of right concerned, as implemented, for example, in the Dutch register.

The Portuguese land register records the positive side of rights in the most cases. As a result, we have not produced a diagram for this Quadrant, but the issue deserves further attention. Another consequence is that in order to verify which encumbrances affect a given property right, one has to retrieve the set of rights recorded for the concerned parcel and examine the record. From the standpoint of the security of a real estate transaction, however, it is fundamental for a buyer to know what negative rights, if any, affect a given parcel. Although an aware the seller will normally inform the buyer about the positive rights, even this cannot be assumed and should be verified against the register.

Object Diagrams

This type of diagram is included in order to show relationships between instances of previously identified real rights and respective subjects (persons)⁷¹ and objects (real estate).

Superficies Right Object Diagram

This diagram shows an example of relationships between a superficies right and respective parties as natural persons (subject names: Francis as superfiary and Bob as *fundeiro*) and real estate (object: Building Reserve). The *fundeiro* (Bob) has the property right in parcel (LA_RecordedObject class in LADM) where the Building is located.

⁷⁰ Zevenbergen, note 6 above.

⁷¹ Represented in LADM by the generic party super-class.

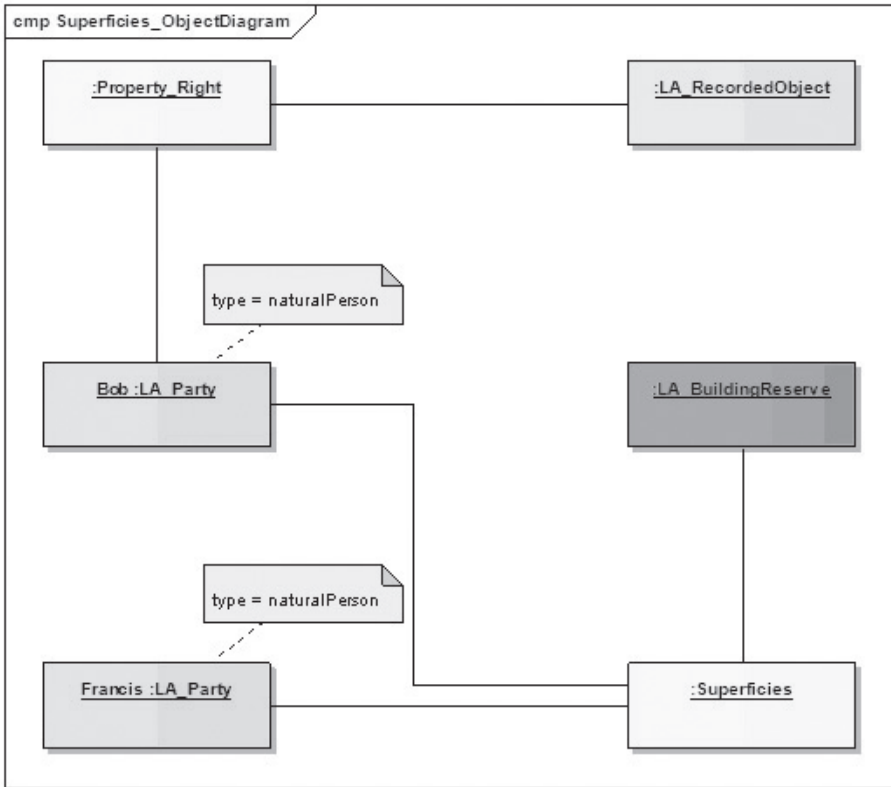


Figure 5 - Superficies Objects

Colours/shades of grey follow general LADM components conventions, as in the following legend:



Horizontal Property Object Diagram

In this diagram objects involved in the horizontal property relationship were included. Real estate objects represent units in a larger (apartment) building, with the individual unit related to a specific natural person, Tom, through the horizontal property right.

To fully characterize horizontal property, however, the parts of the building held in common, represented by the SharedUnit object name, should be related to the group of

persons holding horizontal property rights in the building, that is, the “Condo Owners Assembly” Group Person (LADM: LA_GroupParty), through a common parts right.

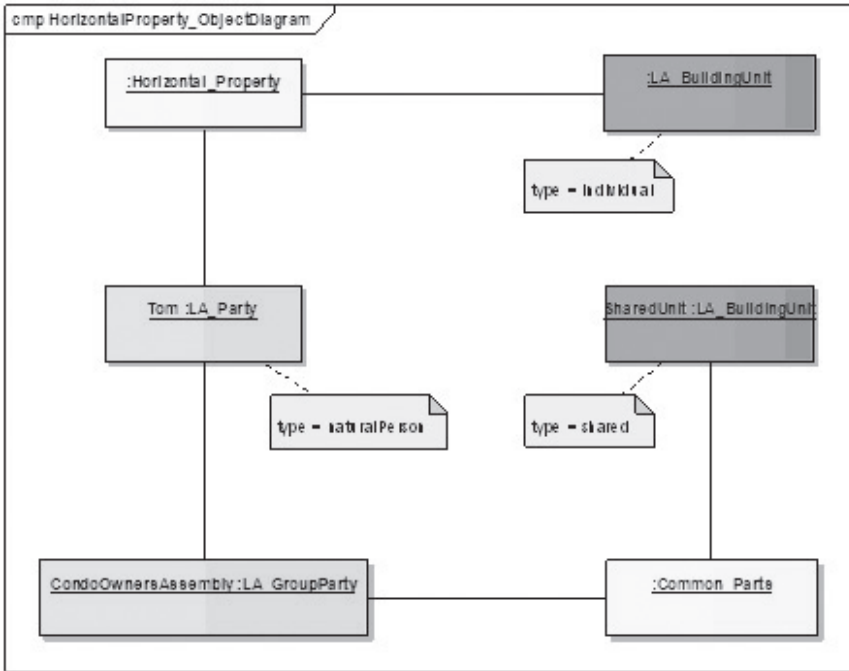


Figure 6 - Horizontal Property Objects

Expropriation Object Diagram

This diagram shows the relationships of the expropriation object with a special type of non-natural person representing the State as the subject (see comment); and with an AdminParcelSet object name⁷² representing the set of parcels that will be expropriated.

⁷² The corresponding class on LADM is the LA_SpatialUnitSet, which is a generic class representing a set of non-contiguous spatial features.

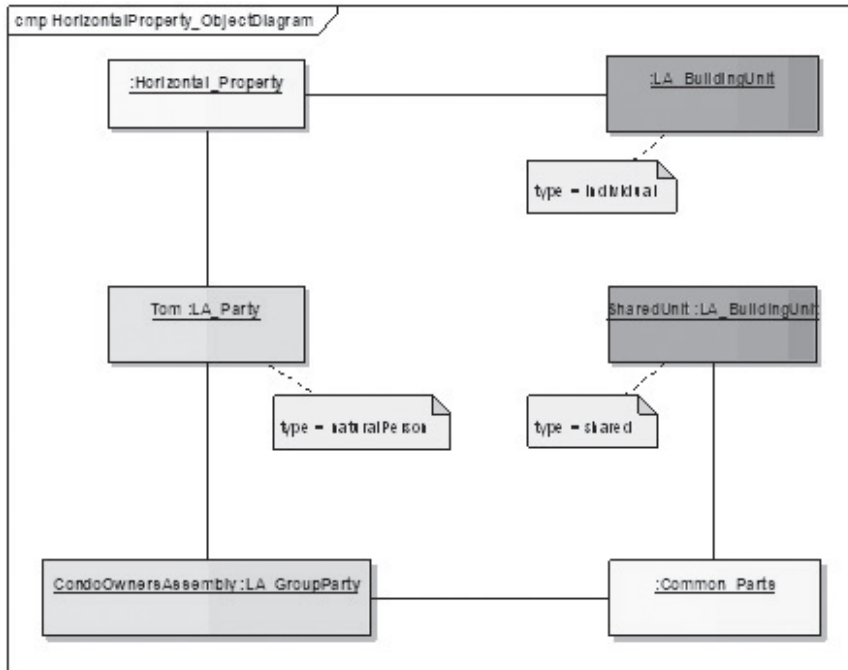


Figure 7 - Expropriation Objects

Expropriation is an administrative procedure, and above diagram merely shows the first phase where affected parcels are identified. In a second phase a number of new land parcel objects should be created in order to define which portions will constitute the public domain (not depicted). The expropriation object is not coloured because this type of objects was not yet determined in the LADM.

CONCLUSIONS AND RECOMMENDATIONS

Differences in legal modelling can be traced back to diverse legal traditions that are a product of national history and society.⁷³ A few differences were immediately detected in definitions contained in *Black's Law Dictionary*; for example, the public servitude compared with the administrative servitude. Such differences lead to a few modifications of the basic model proposed by Paasch, especially concerning the distinction between personal rights classified as real rights of enjoyment and those rights regulated by the general law of contract.

The definitions of Portuguese real rights herein are based on current legal doctrine and, as such, the proposed implementation of the Legal Model followed a doctrinal approach

⁷³ J. Zevenbergen, "Systems of Land Registration – Aspects and Effects" (PhD Thesis TUDelft, Publications on Geodesy 51, Netherlands Geodetic Commission, 2002); also see E. Stubjkaer, "The Institutionalization of Real Property Rights – The Case of Denmark" (2004) (University of Aalborg, unpublished).

in most cases. Although this approach might lead to adoption by Portuguese institutions more readily, further modifications of the basic model were implied, and this may engage different results were a functional approach to be adopted.

An alternative is to suggest a Legal Model having the widest possible application by defining a number of Legal Profiles based on certain legal traditions; for example, for countries which have derived their real rights from Roman law. Such Profiles should enable a more detailed level of analysis based on a simpler and more abstract legal core model.

The results of this study do lack investigation of the behaviour of real rights related to their means of creation, modification or extinction. It is recognized that the modelling of such dynamic aspects may eventually lead to further modifications of the legal model and supply more insight into relationships with other components of the LADM.

As regards the modelling of real rights forming the core of the legal classes presented in the IVth Quadrant (private law, positive side of rights), a number of issues arose from the consideration of previously proposed classifications.⁷⁴ A comparison of each classification with modern Portuguese legal doctrine led to the general conclusion that the most similar classification was that presented in Zevenbergen.

In Portugal there is no clear distinction between derived rights and minor rights; Table 1 attempts such distinctions based on classification definitions.

It was far more difficult to ascribe Portuguese legal right classes to specializations of the appurtenance main class in Paasch. The final result equally reflects (indirectly) a transformation between the two classification schemes. Major discussions revolved around the distinction between personal rights as real rights and personal rights under general contract law. Symptomatic of these difficulties is the fact that there were problems with the personal rights examples. There were also problems with the classification of common rights arising out of the original definition, which precluded some obvious Portuguese candidates as *Baldios*. Thus, the class diagram in Figure 2 was obtained after lengthy discussions between the co-authors and should be regarded as a best fit and not a unanimously agreed result.

It should be said that the class diagrams in the other legal quadrants are a contribution of this article, and consideration of its classification definitions also played a part in the different arrangement presented here (as opposed to original contributions).

Of relevance too, new and clearer insights into the interplay of legal and administrative components and LADM resulted from the modelling effort. Although mainly Portuguese legislation and land administration regulations were considered, the fact that they were reflected in an international modelling effort similar to that in Paasch and LADM could form an important contribution to further developments in this research area.

The main difference between the Paasch and Zevenbergen classifications of real rights relate to the legal doctrinal base. Zevenbergen's classification is built on the tradition of civil codes throughout Western and Southern Europe rooted in Roman law. Paasch's classification is more functional and should be able to fit the set of rights, restrictions and responsibilities regarding land in any legal system of the world, but in a way that challenges the average expert of the legal system through the use of unfamiliar "neutral" terminology.

⁷⁴ Zevenbergen, note 6 above; Paasch, note 12 above.

In the Portuguese implementation presented here, Zevenbergen's classification fitted better, but for a generic LADM the classification by Paasch should be more appropriate.



**KTH Architecture and
The Built Environment**

Classification of real property rights

**- A comparative study of real property rights
in
Germany, Ireland, the Netherlands and Sweden**

Jesper M. Paasch

Report

Real Estate Planning and Land Law
Department of Real Estate and Construction Management
School of Architecture and the Built Environment
KTH Royal Institute of Technology
Stockholm, Sweden

Author: Jesper M. Paasch

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Real Estate Planning and Land Law
Department of Real Estate and Construction Management
School of Architecture and the Built Environment
KTH Royal Institute of Technology
Stockholm, Sweden

Abstract

This report is part of my on-going research at KTH Royal Institute of Technology, Department of Real Estate and Construction Management, Stockholm, Sweden. The aim of this study is to investigate to what extent real property rights registered in national real property information systems - and originating from different legal systems - can be classified according to a theoretical model, the Legal Cadastral Domain Model. A terminological framework for classification of real property rights will further the comparison of real property rights easier and further the cross-border transfer of real property information.

The result of the case-studies is that it to a high degree is possible to classify the investigated rights according to the existing model. However, minor modification have to be implemented into the model to make it able to classify all investigated rights. The case-studies also showed that the model could benefit from other minor changes, such as changing parts of the terminology used in the model.

Keywords

Real property rights, land management, land administration, real property ownership, standardization, legal modelling, terminology

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Jesper Mayntz Paasch

Table of contents

1 Introduction	9
1.1 Background	9
1.2 Scope and delimitation	9
1.2.1 Scope.....	10
1.2.2 Delimitation	11
1.3 Report structure	13
1.4 Research methodology	13
1.5 Translations and notation	14
1.6 Terminology	14
2 Legal systems	16
3 Classification of real property rights.....	18
3.1 Legal Cadastral Domain Model	18
4 Ownership	20
4.1 What is ownership?	20
4.2 Ownership in real property	23
5 National concepts of ownership and real property in the studied countries	25
5.1 Germany	25
5.2 Ireland	28
5.3 The Netherlands.....	30
5.4 Sweden.....	32
6 Investigated rights	34
6.1 Common right	34
6.1.1 Germany	35
6.1.2 Ireland	35
6.1.3 The Netherlands.....	35
6.1.4 Sweden.....	36
6.2 Real property right.....	36
6.2.1 Germany	37
6.2.2 Ireland	39
6.2.3 The Netherlands.....	41
6.2.4 Sweden.....	42
6.3 Personal right.....	43
6.3.1 Germany	44
6.3.2 Ireland	49
6.3.3 The Netherlands.....	51
6.3.4 Sweden.....	55

6.4 Latent right	58
6.4.1 Germany	59
6.4.2 Ireland	60
6.4.3 The Netherlands	61
6.4.4 Sweden.....	62
6.5 Lien	62
6.5.1 Germany	63
6.5.2 Ireland.....	65
6.5.3 The Netherlands.....	65
6.5.4 Sweden.....	66
7 Comparative analysis	67
7.1 Common right class	67
7.2 Real property right class	69
7.3 Personal right class	71
7.4 Latent right class	73
7.5 Lien class	74
8 Conclusion, model modifications and future research	76
8.1 Conclusion	76
8.2 LCDM modifications	77
8.2.1 Necessary modification of LCDM characteristics, definitions, etc.....	77
8.2.2 Other modifications of characteristics, definitions, etc.....	78
8.2.3 Modifications of terminology	81
8.3 Suggestions for future research.....	86
9 Swedish summary	88
10 References	89
10.1 Books, articles and papers	89
10.2 Codes, acts and regulations.....	96
10.2.1 Germany	96
10.2.2 Ireland	97
10.2.3 The Netherlands	97
10.2.4 Sweden.....	97
10.2.5 International	98
Appendix 1	99

1 Introduction

1.1 Background

This report is part of the author's research creating a terminological framework for classification of real property rights and public regulations, called the Legal Cadastral Domain Model (hereafter even referred to as LCDM).¹

Real property rights are part of a nation's legal framework and are connections between the real property right holders and interests in land.² Probably every nation has some sort of formal or informal rights regulating interests in land.³ These rights are vital tools in land management and an instrument of conflict resolution between land owners and others with interests in the same piece of land.

Rights in real property, even by some authors called real rights, are rights beneficial and/or limiting the use of real property.⁴ The model is based on this author's hypothesis that it is possible to classify and structure real property rights in accordance to their characteristics and influence on real property ownership.

1.2 Scope and delimitation

It must be noted that the author deliberately does not make any use of already existing classification systems like e.g. the Roman law classifications of "right in rem" (i.e. the right "follows the land") and "right in personam"

¹ See Paasch (2005b); presentation of the LCDM, and Paasch (2008); a description of the LCDM incl. the characteristics and definitions of real property rights and public regulations.

² See e.g. UNECE (2004) for a collection of national rights regulating the use of real property. The term "land" is here defined as "the surface of the Earth, the materials beneath, the air above and all things fixed to the soil" (UNECE, 2004, p. 58). Water for example, plays an important role in many countries, e.g. being the subject for fishing or watering rights.

³ The author's assumption.

⁴ A real right is "[a] right that is connected with a thing rather than a person. Real rights include ownership, use habitation, usufruct, predial servitude, pledge, and real mortgage" (Garner, 1891). See also Kleyn and Boraine (1975, pp. 43-62) and Hohfeld (1917 and 1913) for an introduction to theories concerning the legal nature of a real right.

(i.e. the right “follows the person”).⁵ The LCDM focus on certain characteristics describing rights and does not, to this author’s knowledge, lean towards any other classification system.

The chosen approach is no judgement against existing classification systems or legal traditions, but an attempt to create a “neutral” way of structuring rights in order to further a terminological framework for cost-effective cross-border transactions of real property information.

1.2.1 Scope

The main scope is through case-studies on registered real property rights in Germany, Ireland, the Netherlands and Sweden to test whether it is possible to classify the rights according the classification in the LCDM and thereby confirm, reject or develop the model. The report even contains suggestions for improvements of the LCDM based on the result of the case-studies and experiences gathered during the testing phases.

The case-studies described in this report are complementing existing case-studies done by this author and others. A preliminary case-study was conducted on the Dutch real property legislation in 2005, studies on the Danish, Swedish, Norwegian, Icelandic and Finnish real property legislations were conducted in 2007 and a study on Portuguese real property legislation (incl. public regulations) were conducted in 2009.⁶ The Dutch and Swedish case-studies in this report are complementing and expanding the Dutch and Swedish studies made in 2005 and 2007.

National legislations consist of, among other things, a number of different rights of which some are more frequently used and vital for land management than others. Each right is the result of a need for a relation to land, executed through a legal process based on different legal, cultural and historical traditions. Each right can therefore be subject for very detailed and comprehensive research analysing any possible aspect depending on the nature of the study. However, this study does not claim to provide an insight in all

⁵ Note that there has been some scholarly discussions concerning the concept of these rights and how to describe the expressions right in rem and right in personam. These discussions are however beyond the scope of this report. See Hohfeld (1917 and 1913) for an introduction to these discussions.

⁶ The Netherlands, see Paasch (2005a). Denmark, Sweden, Norway, Iceland and Finland, see Pålsson and Svensson (2007). Portugal, see Hespanha et al. (2009).

aspects, but focus on whether the investigated rights can be classified according to the LCDM.

The author has through his work at Lantmäteriet [The Swedish Mapping, Cadastre and Land Registration Authority] access to more detailed information about Swedish real property rights than rights in the other countries studied in this report. However, it has been the intention to describe all analysed rights on the “same level” to enable a comparison. The results of the four case-studies would otherwise be difficult to compare and analyse.

1.2.2 Delimitation

It is not within the scope of this study to conduct a complete survey of all real property related rights. The multitude of different existing rights is the result of a large body of laws and regulations. The case-studies are delimited to only include registered rights in the selected nation’s real property registration system(s) (land register).

Each right does in reality often also include obligations of some sort, e.g. the obligation to maintain a road since the right holder has the right to use it or to pay the owner an annual fee for being allowed to harvest products of the real property. The nature of those “return” obligations are not dealt with in detail in this study since it would expand the study to investigate individual rights and what agreement the individual real property owner has with the individual right holder.

The case-studies are as mentioned earlier limited to four European countries. They are each representing one of four main legal families: Germany (the Germanistic family), Ireland (the British family), the Netherlands (the Napoleonic family) and Sweden (the Scandinavian family). Germany, the Netherlands and Sweden belong to the so-called continental Civil Law tradition, whereas Ireland belongs to the British Common Law tradition.⁷ Ireland has been chosen partly because the legal tradition is different from the other and partly because there is an ongoing debate whether the Civil Law and Common Law traditions can be compared since they are made up of different concepts and, according to one scholar, contain “irreducible diffe-

⁷ Common Law is based on English medieval law and “[...] derived from custom and juridical precedent rather than statutes [...]” (Oxford, 1995, p. 291). See also Zweigert and Kötz (1998), Szladitz (1974) (Civil Law) and Wier (1974) (Common Law) for an introduction to the principles of Civil Law and Common Law.

rences”.⁸ However, the modern Irish legal system, while still retaining Common Law traditions and concept of ownership, is today largely based on statute law. This has by this author not been seen as excluding Ireland as a suitable case-study candidate since the legislation has its roots in the Common Law tradition.

European legal systems has had a huge impact on other legislation in the rest of the world due to the fact that local law often was replaced or mixed with the laws of the European colonisers, or by voluntarily borrowing suitable sections from European law and incorporating them into a country’s own national legislation.⁹ The reason for not including the former East European legal family in the case studies is that the so-called “socialist” legal family to a large extent disappeared after the fall of the Iron Curtain and the revised legislations in the former socialist countries has been influenced by other European legal systems.¹⁰ Religious legal systems are also omitted since they do not fit the criteria of the studies to focus on major rights in formal legal systems and registered in the surveyed nation’s real property register(s).¹¹

A further delimitation is that the case-studies only deal with the rights part of the LCDM. The Public regulation and Public advantage parts of the model will be subject for a separate study.

As mentioned earlier, the purpose of the case-studies are to confirm, reject or develop the author’s hypothesis regarding the classification of real property rights. An investigation of the legal and administrative processes leading to the establishment of the national rights, including the procedures in regard of transfer or inheritance of the rights is not part of this report.

It is also beyond the scope of this report to discuss the theoretical classifications of legal families and the structures and differences of private and public law. The focus is on placing real property rights in a theoretical framework regardless of which legal system they belong to.

⁸ Legrand (1996).

⁹ Zweigert and Kötz (1998).

¹⁰ Hoecke and Warrington (1998).

¹¹ The type of the registers are not described or defined in this report. They can be e.g. land registers, land managements systems, cadastral systems, etc.

1.3 Report structure

Chapter 1 provides an introduction to the background of the case-studies together with the scope and delimitation, followed by a description of the research methodology and information concerning the used English legal terminology and the notations used in the diagrams. Chapter 2 briefly describes the field of comparative law and provides a brief insight into principles regarding how legal systems can be classified and thus providing a background and explanation for the selection of the four nations as subjects for the case studies. Chapter 3 provides an introduction and explanation to the hypothesis tested in this report. Chapter 4 contains an introduction to the concept of ownership in general and forms of ownership within the field of real property. Chapter 5 provides an introduction to the concept of real property ownership in the countries selected for the case-studies. Chapter 6 contains descriptions of the registered rights found in the case-studies. The rights are structured according to the classification in the LCDM. Chapter 7 contains a comparative analysis of the investigated rights. Chapter 8 contains the conclusion regarding the validation of the LCDM, suggestions for modifications and an updated version based on the modifications. A Swedish language summary is located in chapter 9. Literature and other references are placed in chapter 10. Appendix 1 contains the updated class descriptions of the LCDM.

1.4 Research methodology

The case-studies were initiated after the publication of the before mentioned hypothesis and the theoretical, legal framework in 2005 and 2008.¹² The Dutch case-study was the first to be started and the Irish case-study was the last, due to an ongoing revision of Irish land law legislation, resulting in the Land and Conveyancing Law Reform Act of 2009.

The case-studies have primarily been conducted through research in the national legal codes and acts, supplemented with literature research and interviews with key persons in the field of real property rights in each country. A standard template with questions has not been used due to the complexity of

¹² Paasch (2008 and 2005b). Parallel activities were performed during 2005-2008, e.g. the before mentioned preliminary Dutch case-study on rights (Paasch, 2005a) due to the author's involvement in the EU COST G9 project, resulting in a study visit at Delft University, the Netherlands, during October 2005, and the supervision of a Swedish masters degree thesis in land management about the classification of rights in the Nordic countries (Pålsson and Svensson, 2007).

rights in the different legislations. However, introductions to the research project were given to the key persons before the interviews.

All findings and questions were followed up with either additional personal meetings and/or e-mail communication. The case-studies were completed during May 2011. Any later changes in legislation, etc. have not been considered.

1.5 Translations and notation

The national legal acts have been studied in their native languages, except the Dutch Civil Code, where an English translation has been used, unless otherwise noted. It has not been possible to locate English translations of all used German, Dutch and Swedish legal terms, in which case an “as close as possible” translation has been provided by the author or the national legal term is used, if judged to be more appropriate.¹³

The diagrams in this report are intended to be as illustrative and accessible as possible, avoiding the use of specific notations, such as UML (Unified Modelling Language).

1.6 Terminology

During the conduction of the case studies the English translations of national legislations have been subject of some speculation and concern for this author. An example is that the terms “common” and “joint” are not always used in the same way in different translations of legislations and the studied English literature. For example a “common property” can have the same characteristics as a “joint property”. They are just sometimes translated differently.

Another example is the use of the terms “easement” and “servitude”, which are not standardized. An easement is described as “a right enjoyed by one

¹³ The translation of the German legal terms is taken from an on-line English version of the German Civil Code, http://www.gesetze-im-internet.de/englisch_bgb/ unless otherwise noted. The translation has been recommended by Mr. Volker Strehl, German Ministry of Justice, by e-mail communication on March 24th 2010. The translations of the Dutch Civil Code are taken from Haanappel and Mackaay (1990) unless otherwise noted. The Swedish terms are taken from Mattsson and Österberg (2007) unless otherwise noted.

real property (the dominant tenement) over that of another (the servient tenement) for instance a right of access or for the passage of water or electricity”¹⁴ and “[a]n interest in land owned by another person, consisting in the right to use or control the land, or an area above or below it, for a specific limited purpose (such as to cross the land to access a public road).”¹⁵ Servitude is described as “an easement or right of one real property over another”¹⁶ and ” [a]n encumbrance consisting in a right to the limited use of a piece of land or other immovable property without the possession of it; a charge or burden on an estate for another’s benefit [...] the easement by necessity is an equitable servitude [...]. Servitudes include easements, irrevocable licenses, profits and real covenants.”¹⁷ These examples show that servitude is a wider term than easement in English land management terminology.

The emphasis is on using the English terms most commonly used in the translations and literature. However, this author has made one exception. The translation of the Dutch legislation uses “servitude”, but this author has chosen to use “easement” throughout this report since the right described is functioning as an easement (i.e. a real properties right in another real property). Translations of the German and Swedish legislations use “easement” for the same type of right.

It must also be noted that ISO¹⁸ currently is working on producing an international standard for (real property related) land administration called the Land Administration Domain Model, LADM. However, the terminology in the LADM has not been used in the Legal Cadastral Domain Model since the LADM standard is still under development and changes may yet occur.¹⁹

¹⁴ UNECE (2004, p. 57).

¹⁵ Garner (1891, p. 431).

¹⁶ UNECE (2004, p. 61).

¹⁷ Garner (1891, p. 1138).

¹⁸ International Organization for Standardization.

¹⁹ ISO/TC211 (2011). The draft LADM standard is currently in the review and voting phase among ISO’s member nations and expected to be accepted as an international standard in July 2012.

2 Legal systems

We sometimes speak of *the* legal system – as if there existed one single, unitary system of law. However, there is no such thing as a “natural” or universal form of law. All forms of law reflect the aspects of the culture and values of the society to which they belong.²⁰ Every nation has its own legal statutes describing which rights can be created in order to improve the use of land. Needless to say, there are a multitude of different rights in existence throughout the world, which make it difficult and time consuming to compare them when they e.g. are subject for cross border real property transactions.²¹ Even if systems might have emerged from common legal roots, as e.g. the legal systems of continental Europe, which - to a large extent - have their origin in ancient Roman law, there is no such thing as two identical legal systems.²²

Legal systems can however be divided into legal cultures or “families”, based on factors depending on the perspective of the researcher, looking at e.g. the cultural and historical heritage, the use of legislation in a specific geographical area or by size, how many who are governed by a specific legislation, etc. A division of law can also be made in the private law and public law families.²³ Real property rights are part of the private law domain, whereas e.g. real property regulations (e.g. zoning plans etc.) are part of the public law domain.

The classification of legal systems is a subject for debate among legal scholars and several classifications exist. One example is the classification produced by Zweigert and Kötz, who are grouping legal systems into 6 major families: a Germanic family, a Romanistic family, an Anglo-American family, a Nordic legal family, law in the Far East, and the religious legal systems.²⁴ A legal system might be the result of different legal influences, even if some influences may be more dominant than others, depending on the nature of interaction. Any classification may therefore be influenced by what

²⁰ Zweigert and Kötz (1998).

²¹ Paasch (2008 and 2007).

²² Hoecke and Warrington (1998).

²³ Private law is “law relating to individual persons and private property” (Oxford 1995, p. 1151) and public law is “[...] the law of relations between individuals and the state” (Oxford 1995, p. 1167).

²⁴ Zweigert and Kötz (1998). Other examples are the Civil Law system, the Common Law system, the system of Socialist Law, Islamic Law, Hindu Law and African law (David et al., 1974). See also Legrand (1999) and Hoecke and Warrington (1998) for an introduction to the classification of legal systems.

part of the legislation that has to be classified, e.g. family law, contractual law or real property law.

There is no universal language to express law. Within any community which speaks a particular natural language, there are likely to be narrower groups which differ from each other in the particular ways in which they use their professional language(s). These specialised professional languages may even differ within themselves and one legal area may use different expressions and vocabulary than another area within the same professional domain. We therefore have to find out to what extent the words used in the compared legal systems bear the same meaning.²⁵ The correct understanding of the use of words is vital when comparing different legal systems in the field of comparative law.

Regardless of choice of comparative method, the use of ontological and epistemological approaches cannot be over-estimated.²⁶ We need to know what we are talking about and the legal terms need to be analysed for their specific content based on their cultural and historical context. It has been stated that “[o]ne can speak of comparative law only if there are specific comparative reflections on the problem to which the work is devoted.”²⁷ Furthermore, it has been noted that “[h]idden understandings are uncovered when we try to find out why foreign legal rules, approaches and the like are different from ours.”²⁸ Some of those “hidden understandings” can be discovered by investigating the characteristics which lie behind the legal terms and legal rules. It is the characteristics that describe them and make them what they are.

²⁵ See Jackson (1995) for a discussion of the use of language within the legal domain.

²⁶ A discussion of the value of ontology and terminology in comparative law has been addressed by several legal scholars, e.g. Hoecke (2004).

²⁷ Zweigert and Kötz (1998, p. 6).

²⁸ Hoecke and Warrington (1998, p. 497).

3 Classification of real property rights

This chapter only provides a brief introduction to the Legal Cadastral Domain Model.²⁹ The model is based on the author's hypothesis claiming that it is possible to classify real property rights and public regulations regardless of their origin within a legal system or family.

3.1 Legal Cadastral Domain Model

Ownership is the “main” right in the model and is creating a relation between a person, i.e. the property owner, and land. However, ownership can be influenced by other interests in land; e.g. use rights allowing others right of way over your property or a pre-emption right to buy a piece of land when it is put up for sale, or in other ways regulating the present or future use of a real property.

The central LCDM classes are the appurtenance, encumbrance, public advantage and public regulation classes. The encumbrance and appurtenance classes contain privately imposed rights affecting the ownership of real property by being either limiting or beneficial to ownership. The public regulation and public advantage classes contain publicly imposed regulations being either limiting or beneficial to ownership.

The encumbrance and appurtenance classes can be divided into 5 subclasses, named after the type of rights they contain: common right, containing relations to land legally attached to two or more real properties; real property right, containing rights executed by a real property in another real property; personal right, containing rights executed by a person in a real property; latent right, containing rights not yet executed, and lien, containing financial securities in real property. The rights classes are described in chapter 6.

The public regulation class contains publicly imposed regulations, e.g. regional- and municipal zoning plans, which, among other things, regulate the use and appearance of specific areas. An example is a municipal planning regulation where and how to build in a specific area or protecting environmentally important biotopes from damage. The public advantage class consists of public advantages granted to specific real property owners. They are allowed to do something others are not allowed to, for example by being

²⁹ Paasch (2008 and 2005b).

granted a dispensation from a public regulation which is regulating the neighbouring areas, thereby creating an advantage for the real property obtaining the dispensation.

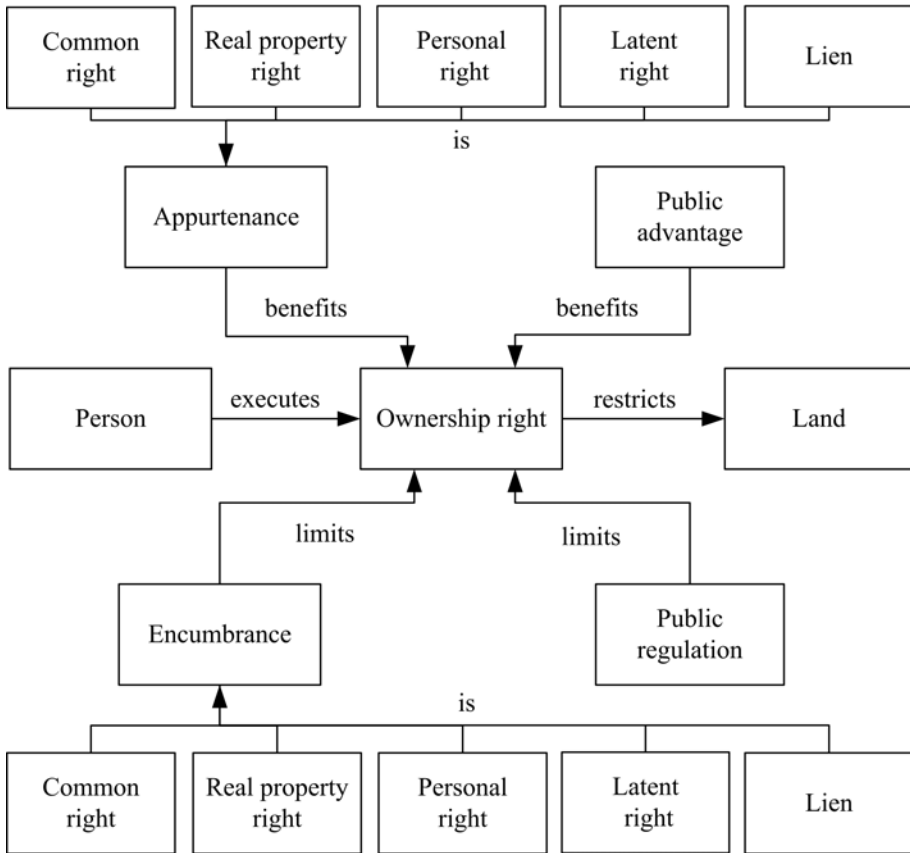


Figure 3.1. The Legal Cadastral Domain Model.³⁰

³⁰ The LCDM is in Paasch (2005b, p. 132) described using UML-notation. The presentation of the LCDM has in report been simplified due to pedagogic reasons.

4 Ownership

This chapter does not provide any universal definition of ownership, but briefly illustrates the concept of ownership in general and provides an introduction to the concept of ownership of real property.

4.1 What is ownership?

We are all surrounded by material and immaterial objects we call our own, e.g. our clothes, a car, maybe a copyright to a piece of music or a piece of land which we call home. Ownership is seen as a fundamental right in many societies and society as we know it would not function without it.

A common definition of ownership does not exist, even if the concept has been discussed by philosophers and legal scholars for centuries.³¹ However, it has been argued that ownership is based on prevailing rules and conventions and if there were no rules there would be nothing like owning, buying, selling, stealing, etc. There would, in other words, be no property to own.³² Everyone would, in theory, have access to and part of a common possession of everything. However, this idealistic concept does not exist in our western society where the general rule is that objects are owned by someone and where ownership plays an important role in the social, legal and economic aspects of society. Objects can be owned by individuals, organisations or States and combinations thereof.³³ There is probably not a thing or a place on Earth where ownership is not regulated by national rules or international conventions, even if the object is not traditionally thought of as owned by anyone. Even Antarctica, which has no permanent population, is regulated by a treaty, which, among other things, denies any (new) territorial claims to the continent.³⁴

³¹ See Hohfeld (1917 and 1913) for a detailed discussion concerning the nature and classification of a right, incl. the right of ownership.

³² Snare (1972, p. 25).

³³ The special case where animals might be made owner of property in certain countries, e.g. through inheritance, is not covered in this report.

³⁴ Excerpt from the Antarctic Treaty, article 4, section 2: “No new claim, or enlargement of an existing claim to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.”

Sometimes, legal scholars speak about “absolute ownership” as the strongest right in an object.³⁵ However, the term is in this author’s opinion not well chosen since there rarely is an executable right called “absolute ownership”.

It has been noted that “absolute” is “[...] probably the most slippery word met in discussions of ownership. Sometimes it is used to deny the “temporary” (in-transmissible or determinate) character of an interest, [...] sometimes to deny its feasible character [...], sometimes to emphasize its exemption from social control”.³⁶ Even if it is doubtful that ownership can be absolute, it can be claimed that ownership is the greatest possible interest in a thing which a mature system of law recognizes.³⁷ However, this author is of the opinion that the concept of absolute ownership at the same time is a good starting point for the analysis presented in this report.

This “greatest possible interest” is subject to legislation. For example, even if someone has bought a car and the person is the owner, he is probably in most legal systems not allowed to drive it until he is both old enough and have obtained a driving license. Other restrictions might also apply, e.g. he cannot use certain medication or enjoy alcohols prior to or when he drives. He is in other words restricted by a web of legislation limiting his actions towards the object he owns and executed the major interest in. These relations are of different nature and solving different needs making society work.

However, even if there might be a multitude of different needs, the concept of ownership has been said to be of a homogeneous nature. It has been noted that “[...] the standard incidents of ownership do not vary from system to system in the erratic way implied by some writers. On the contrary, they have a tendency to remain constant from place to place, and even from age to age.”³⁸

These “incidents” can be compromised to a combination of rights.³⁹ The common nominator for these rights is that they exist for an unlimited time span. The right of unlimited possession in time is the core of the concept of ownership and means that the owner executes his right until he decides to part with his property. When he dies, the property is either inherited by his

³⁵ E.g. Wegen et al. (1998, p. 213).

³⁶ Honoré (1987, pp. 189-190).

³⁷ Honoré (1987).

³⁸ Honoré (1987, p. 162).

³⁹ The ownership rights listed in this report are based on Honoré (1987), Snare (1972), Bergström (1956) and Hohfeld (1917 and 1913).

family or others according to national legislation. Even if an owner owns his property “forever”, it can be made subject for national intervention like a forced sale, typically an expropriation, in which case the owner normally is compensated financially according to national law. The right of unlimited possession in time can be said to be a combination of the following rights.

The right to use, manage and exclude

The right to use, the right to manage and the right to exclude are rights that overlap, depending on the interpretation of the rights. The right to use is the right to use the property to any (legal) purpose the owner want. The right to use does not imply that the owner has to be the actual, physical user of the property. The owner can have transferred some specific use rights, e.g. by a lease, to others for a specific period of time. However, the use right goes back to the owner when the contract ends. The right to manage is the right to decide how and by whom the object shall be used.⁴⁰ The owner can decide which conditions that may apply to e.g. a rent. The owner has the right to exclude anyone using his property. An example is that a real property owner can exclude others from entering his real property, if they are not entitled thereto according to legislation.

The right to added value

The owner has the right to the added value / financial income of his property, e.g. by collecting a rent or by harvesting the fruits and crops growing on his land. The type of income, e.g. monetary or physical services rendered to the owner depends on the nature and use of the property.

The right of transfer

The right of transfer is the right to transfer the property according to the owner’s choice. The property can be given away without compensation, sold or inherited.

Ownership is a combination of the above mentioned relations between person(s) (subject), i.e. the owner, and the entities (object) in question. See figure 4.1.

⁴⁰ Honoré (1987, p. 168).

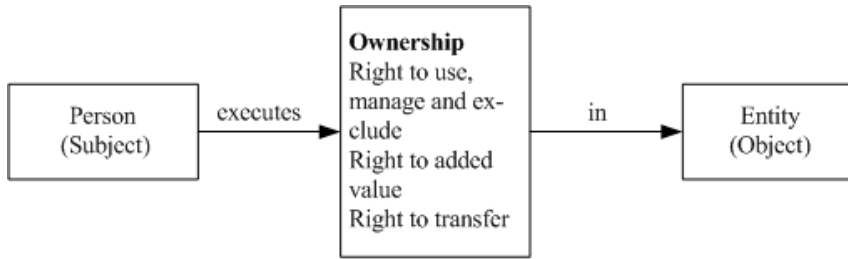


Figure 4.1. The concept of ownership. The relation between person (subject), ownership and entity (object).

The collection of rights described above is of course subject to national legislation. If for example an object, e.g. a gun, is confiscated by the police due to the fact that the owner did not have a license, the ownership is transferred to the State by confiscation of the gun. The owner's right to transfer is in this case not executed voluntarily by him, but has been taken over by the State due to his failure to comply with certain regulations.⁴¹

The right of ownership does not automatically mean that the owner is forced to execute all use rights himself in the object in question. The rights can individually be transferred to others by the owner for a shorter or longer period of time due to national legislation, regulating the access and use of land, and thereby reducing the owners own actual use rights on his property. Examples are to allow someone to use a specific part of the property for certain activities and/or to benefit from any financial income generated by the property. However, these rights are often limited in time and do not constitute any claim of ownership. The right reverts back to the owner when the agreement with the right holder ends.

4.2 Ownership in real property

The ownership principles stated above also apply to ownership in real property. The object is in the case of real property ownership a piece of land, including water and space (air), depending on national legislation.

⁴¹ This report does not discuss that it could be argued that he, in theory, did not actually own the gun, since he could not legally execute the rights described above, necessary to be titled the owner of the object.

Ownership right in land can be regarded as a part of the “bundle of rights”⁴² or “web of interests”⁴³ regulating the use of a real property and can be considered the major right in the “bundle”. See figure 4.2.

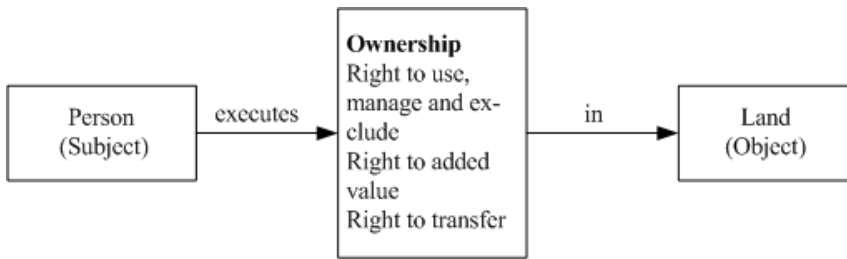


Figure 4.2. The concept of ownership in land.⁴⁴

Ownership can be executed through a number of national legal instruments and in different ownership constellations. Examples are by owning the real property individually, joint ownership by e.g. husband and wife together, ownership through different forms of shareholder solutions, etc.⁴⁵ Ownership may also be combined with separate use rights in the same real property or building. An example is areal property commonly owned by a group of people (or company or owners association) where an individual co-owner has designated areas (typically condominiums) assigned to him.

⁴² The term is used by Garner (1891, p. 933).

⁴³ Meinzen-Dick and Mwangi (2008).

⁴⁴ Based on Henssen (1995).

⁴⁵ There is a distinction between ownership in common and joint ownership. Ownership in common is, in the Anglo-American legal tradition, described as “[o]wnership shared by two or more persons whose interests are divisible. Typically an owner’s interest, at death, passes to the dead owner’s heirs or successors” (Garner, 1891, p. 934). Joint ownership is a sub-class of ownership in common and has been described as “[u]ndivided ownership shared by two or more persons. Typically, an owner’s interest, at death, passes to the surviving owner or owners by virtue of the right of survivorship” (Garner, 1891, p. 934). The typical case might be when husband and wife own 50% each of the property. When one of them dies, his/her share is transferred to/inherited by the surviving part. The number of owners is reduced, in opposite to common ownership, where the number is constant (or even expanding if someone decides to divide his share and sell them separately).

5 National concepts of ownership and real property in the studied countries

It is in this report not possible to give a detailed account of the legal concepts of ownership and real property in the selected countries, being pillar-stones in land management. This chapter therefore only provides an introduction to the concepts of ownership in the studied countries before addressing the registered national real property rights in chapter 6.

5.1 Germany

The German legal system belongs to the Civil Law tradition and the Germanistic legal family. The country consists of 16 self governed regions [Bundesländer] with local legislative power and a federal national government responsible for national politics and legislation. The legislation about ownership [Eigentum] and real property is to a huge extent federal and the main body is the German Civil Code [Bürgerliches Gesetzbuch] (hereafter referred to as BGB) which, among other things, is regulating ownership and general provisions on interests in land and other land related rights.⁴⁶ Other acts and provisions regulating the use of land are e.g. The Land Register Act [Grundbuchordnung, GBO], the Condominium Ownership Act [Wohnungseigentumsgesetz, WEG]⁴⁷ and the Regulation on Building Leases [Verordnung über das Erbbaurecht].⁴⁸

Property is classified into moveable things [bewegliche Sachen] and immovable things [unbewegliche Sachen]. Movable property is property that is not real property [Grundstück] or property fixture [Grundstücksbestandteile], which is regarded immovable property.⁴⁹ The BGB states that “only physical objects are, in the concept of the law, things”.⁵⁰ However, these things does

⁴⁶ BGB, sections 90-103 (things and animals), BGB, sections 873-902 (general provisions on rights in land) and sections 985-1007 (claims arising from ownership). See Herrmann (2008a, 2008b and 2008c) for an overview of the concept of ownership in Germany.

⁴⁷ Author's translation.

⁴⁸ Author's translation.

⁴⁹ Müller (1988, p. 15). "Grundstück" is in the BGB, section 1031, translated as "a plot of land."

⁵⁰ In German: "Sachen, im Sinne des Gesetzes, sind nur körperliche Gegenstände." BGB, section 90.

include certain rights in rights like usufructs in rights and pledge in rights.⁵¹ The BGB also states that the owner can use his property at his pleasure, within the limitations given by legislation.⁵²

A real property is described as a piece of the surface of the Earth registered in the German Land Register [Grundbuch].⁵³ Components of a real property are the things connected to the plot of land, especially buildings and plants.⁵⁴ A real property consist of one or more separate parcels [Flurstücke] which has to be registered in the Land Register, as stated in the Land Register Act.⁵⁵ Most real property is of the so-called traditional two-dimensional type, however three-dimensional real property also exist.

Real property ownership is executed in different forms; individual ownership, joint ownership and ownership in common; a person can own a real property through individual ownership. Joint ownership exists when a group of heirs or husband and wife or registered partners can own a real property together through joint ownership [Gesamthandgemeinschaft].⁵⁶ There are three sorts of joint ownership in Germany; Civil Law partnership, joint martial property and joint estate ownership.⁵⁷ Each person does not own a specific (but often more imaginary) share, but shares the whole property with the other owners.⁵⁸

There also exists an old and rather special right of joint ownership called Haurecht,⁵⁹ with additional specific rights attached to it.⁶⁰ The right allows a real property to own shares in a designated area, called a Hauberg. The right holders are required to be a member of the Hauberg ownership association [Hauberggemeinschaft], giving its members the right to extract timber and

⁵¹ BGB, sections 1068-1084 (usufruct in rights), sections 1273-1296 (pledge of rights). Seiler (2008, pp. 959-963).

⁵² BGB, section 903.

⁵³ Land Register Act.

⁵⁴ BGB, sections 93-94. Hertel and Wicke (2005).

⁵⁵ See Ahrens (2004) for a description of real property. However, publicly owned real property, rivers, public roads, etc. are only registered in the land register if desired by the owner or right holder. Land Register Act, section 3, part 2.

⁵⁶ BGB, section 1419.

⁵⁷ BGB, sections 718-719 (Civil Law partnership), BGB sections 1408 and 1415 (martial property) and BGB section 2023 (joint estate ownership of coheirs). The term "joint ownership" is used in Wegen et al. (1998).

⁵⁸ BGB. section 2040.

⁵⁹ The name may derive from the German words "hauen" [to cut] and "Recht" [right].

⁶⁰ E-mail communication with Dr. Markus Seifert, January 21st 2011.

other related goods from the forest.⁶¹ They are, however, not in the centre of German land management today.

The concept of ownership in common differs from joint ownership in the sense that ownership in common is executed through fractional shares [Bruchteileigentum (Miteigentum nach Bruchteilen)].⁶² The owners have a share in the whole property and constitute an ownership association [Bruchteilsgemeinschaft].⁶³

The ownership of condominiums [Eigentumswohnungen] is also based on ownership in common through shares. The ownership is granted in a localised part of the otherwise common property [Sondereigentum]. The common part(s) of the building and land are jointly owned. Non-structurally delimited jointly owned areas, e.g. a garden area, can be designated to the use of specific individuals through an agreement with the other co-owners by creating a use right [Sondernutzungsrecht].⁶⁴ The different shares are recorded in a separate plan [Aufteilungsplan], which is registered the land register.⁶⁵ A further type of condominium ownership exist which is know as Building property [Gebäudeeigentum]. The right was in the former German Democratic Republic (DDR) for the construction or use of a building, but is still present in the real property register today.⁶⁶

Another concept of ownership in common are areas owned by e.g. a village or parish for common use for farmers for e.g. grazing of domestic animals or collecting wood [Allmende]. These areas are often the remains of medieval or pre-medieval land management laws and have survived until today.⁶⁷

⁶¹ Hilf (1938) and Hausrath (1982, pp. 187-188). An example of a Hauberg ownership association is the association for the Dill and Oberwesterwald areas in Prussia. The membership right has historically only been granted by inheritance or occasionally by the purchase of a farm with already had a membership share. However, it is today possible to acquire a share in a Hauberg through normal purchase. The Hauberg areas are (in Hestia) part of the so-called commonly owned forests [Gemeinschaftswald]. Schwarz (2005) and e-mail communication with Mr. Ralf Schmidt, August 10th 2009.

⁶² BGB, sections 1008-1011.

⁶³ BGB, sections 741-758.

⁶⁴ Paulsson (2007, pp. 112-113).

⁶⁵ Apartment Ownership Act. See Paulsson (2007 p. 36 and pp. 95-135) for a survey of German condominium ownership.

⁶⁶ Introductory Act to the Civil Code, section 233, part 2b. ALKIS (2007), Hertel and Wicke (2004, section 1.4).

⁶⁷ Schildt (2008, Allmende).

A special type of property is the so-called neighbouring real property [Anliegerflurstück], which is land being part of two or more real other real properties.

Real property is affected by a number of different rights allowing others the use or access to the property or use it as a security for e.g. a loan. The rights regulating the use and access to real property are with a general name called use rights [Nutzungsrechte] in German. Rights in a thing itself are called “dingliche Rechte”, and i.e. claims in a thing itself are called “dingliche Ansprüche”. The names are not used in the BGB itself, but mean that the right lies on the “thing” itself, and not on the person who owns it. These rights are not restricted to the field of real property but are also implied on ownership in general. Ownership is one example of a “dingliches Recht” and a right in a real property is an example of “dinglicher Anspruch”.⁶⁸ It is not possible to provide a list of the multitude of different purposes for use rights registered in the Land Register.⁶⁹

5.2 Ireland

The Irish legal system has its roots in the Common Law legal tradition and the British legal family. It is one of the results of the Norman Conquest of Ireland in the 12th century by King Henry II of England, which lasted until the early 20th century, except for Northern Ireland, which still is part of the United Kingdom today. The laws regulating land ownership and conveyancing has been developed and added to during the centuries, resulting in a very complex body, comprising a large number of statutes and court decisions making it difficult to implement in an effective manner in a modern society. The modern Irish legal system, while still retaining Common Law principles, is today however largely based on statute law, e.g. the Land and Conveyancing Law Reform Act (hereafter referred to as the Reform Act).⁷⁰ The Reform Act is the result of a recent major reform making the Irish land

⁶⁸ In German: „Dingliche Nutzungsrechte haben einen Ausschließlichkeitscharakter. Sie enthalten also eine absolute Wirkung gegenüber jedermann“ (Ahrens, 2004, p. 40). See Seiler (2008, pp. 959-963) for an account on “dingliche” rights and claims.

⁶⁹ E-mail communication with Dr. Markus Seifert, March 30th 2009.

⁷⁰ “[C]onveyance” includes an appointment, assent, assignment, charge, disclaimer, lease, mortgage, release, surrender, transfer, vesting certificate, vesting declaration, vesting order and every other assurance by way of instrument except a will [...]” . Reform Act, part 1, section 3.

laws and conveyancing processes suitable for modern conveyancing (eConveyancing).⁷¹

Property is classified into moveable property and immovable property. Land has earlier been defined in a number of different statutes. The Reform Act adopts these definitions, which state that land includes any estate or interest in or over land, mines, minerals and other substances, land covered by water, buildings and structures of any kind, but takes the expanded meaning that land also includes both the airspace above and the substratum below.⁷² The Reform Act continues the principle that what is owned is not the physical entity, i.e. the land, but “[...] rather some estate (giving substantial rights in respect of the land such as the right to occupy it) or interest (giving less substantial rights such as the limited use given by an easement comprising, for example, a right of way over a road on the land, or a profit á prendre comprising a right to cut and take away turf) in the land.”⁷³

The Reform Act abolishes the last remains of medieval, feudal land holding, going back to the Norman times. However, the country will (still) be dominated by so-called freehold and leasehold estates, which both are categorised as legal estates in the Reform Act.⁷⁴ Freehold is still the highest estate or interest and closest to the concept of ownership in land that exists in Civil Law countries. Leasehold is a concept allowing (an often very long term) exclusive use right of a piece of land.⁷⁵ The right of leasehold can be almost as strong as freehold.⁷⁶ Other forms of freehold, like fee farm grant fee tail and life estate cannot be granted anymore.⁷⁷ Fee farm grant involved, in essence, a “[...] grant of a freehold estate (a fee simple) subject to (potentially) a perpetual rent (i.e. one that would be payable so long as the fee simple [...] lasted).”⁷⁸ Fee tail means, in short, an estate which is passed down through generations in one family. Leases for lives were fairly common but are now obsolete. The few ones existing are being allowed to continue until they end.

⁷¹ See Brennan and Casey (2000) for an introduction to the law revision work.

⁷² Reform Act, part 1, section 3.

⁷³ Explanatory Memorandum of the Reform Act, pp. 3-11.

⁷⁴ E-mail communication with Mr. Fergus Hayden, October 15th 2010.

⁷⁵ The term leasehold is derived from “less”, i.e. less than freehold. Personal communication with Mr. Fergus Hayden, May 18th 2009.

⁷⁶ Reform Act, part 2, section 11, subsection 3. See also Brennan and Casey (2000) and Keane (1998) for descriptions of the Irish concepts of ownership, freehold and leasehold.

⁷⁷ Reform Act, part 2, sections 12-14 and Explanatory Memorandum of the Reform Act, pp. 3-11.

⁷⁸ Explanatory Memorandum of the Reform Act, p. 4.

Most existing fee tail will be converted into fee simple freehold.⁷⁹ Existing fee farm grants are not affected by the Reform Act.

Real property ownership is executed in different forms; individual ownership, joint ownership and ownership in common; A person can own a real property through individual ownership. Joint ownership exists when group of heirs or husband and wife or registered partners own a real property together. The key feature of joint ownership is that the land is inherited by the other joint owners, in contrast to ownership in common, where the owners have distinct, but undivided, shares which can be inherited by others.⁸⁰

Condominium ownership is common in Ireland. The most frequent case is that the persons own their apartments, but the common areas such as staircases, etc. are owned by a management company.⁸¹

5.3 The Netherlands

The Dutch legal system belongs to the Civil Law tradition and the Napoleonic legal family. Ownership and real property is dealt with in the main legislative body, the Civil Code [Nieuw Nederlands Burgerlijk Wetboek Het Vermogensrecht].⁸² Other legislations regulating real property ownership and rights are e.g. the Hire-purchase Act [Wet van 21 juni 1973, houdende tijdelijke regeling betreffende huurkoop van onroerend goed] and The Municipal Pre-emption Rights Act [Wet Voorkeursrecht Gemeenten, WVG].

Ownership [eigendom] is the most comprehensive right a person can have in a thing [zaak]. The Dutch legislation makes a difference between movable [roerend] property and immovable [onroerend] property.⁸³

⁷⁹ Only "special" fee tail are allowed to exist until they are extinguished by the death of the right holder. See the Explanatory Memorandum of the Reform Act, pp. 10-11, for details.

⁸⁰ Reform Act, part 7, sections 30-32, and the Explanatory Memorandum of the Reform Act, pp. 19-21.

⁸¹ Other apartment ownership constructions also exist. See LRC (2008) for details.

⁸² See also Nieper and Ploeger (1999), Ploeger, Velten and Zevenbergen (2005), Slangen and Wiggers (1998) and Witt and Tomlow (2002) for descriptions of Dutch ownership and real property.

⁸³ Civil Code, Book 5 article 1 to 3 (ownership in general) and article 20 to 36 (ownership of immoveable things).

Real property is described as “[...] land, unextracted minerals, plants attached to land, buildings and works durably united with land, either directly or through incorporation with other buildings or works.”⁸⁴ The ownership of land comprises “the surface; the layers of soil under the surface; subsoil water which has surfaced by means of a spring, well or pump; water which is on the land and not in direct connection with water on the land of another person; buildings and works durably united with the land, either directly or through incorporation with other buildings or works, to the extent that they are not component parts of an immovable thing of another person; and plants united with the land” and “the right of the owner of land to use it includes the right to use what is above and below the surface” and “[o]ther persons may use what is above and below the surface if this takes place so high above or so deep below the surface that the owner has no interest to object hereto.”⁸⁵ Most real property are of the so-called traditional two-dimensional type, however three-dimensional real property also exist. The concept of real property also includes ships and airplanes.

Real property ownership is executed in different forms; individual ownership and ownership in common. A person can own a real property through individual ownership. When two or more persons acquire a real property they own the property in common. The real property is not divided into separate parts and the owners own equal shares in the property.⁸⁶

Condominium ownership also exists in the Netherlands. The owners are considered co-owners of the whole complex: land, building, common areas and all apartment units.⁸⁷ The individual right holder(s) are considered the owners of their apartments.⁸⁸ Each owner holder has an exclusive right [apartmentsrecht] to use one (or more) apartment units. The owners association [vereniging van eigenaren] does not own the common parts of the complex, which are owned by the co-owners, but is responsible for the daily management. The concept of condominium ownership has been known in the Netherlands since 1951. Before 1951 experiments with another form of more contractual ownership were in use and some of those old apartment ownership substitutes can still be found.⁸⁹

⁸⁴ Civil Code, Book 3, article 3.

⁸⁵ Civil Code, Book 5, article 21, sections 1 and 2.

⁸⁶ Slangen and Wiggers (1998, pp. 359-360).

⁸⁷ Civil Code, Book 5, articles 106 to 147.

⁸⁸ Civil Code, Book 5, article 106, section 3.

⁸⁹ The substitutes are where there are apartment owners associations. The structure differs from the new ownership construction and it is similar to a registered company. Personal communication with Dr. Hendrik Ploeger, October 3rd 2005.

5.4 Sweden

The Swedish legal system belongs to the Civil Law tradition and the Scandinavian legal family.⁹⁰ The central provisions regarding ownership and use of land are the Swedish Land Code [Jordabalken] and the Real Property Formation Act [Fastighetsbildningslagen].⁹¹

The concept of ownership [ägenderätt] is divided into movable property [lös egendom] and immovable (real) property [fast egendom].⁹² A real property unit [fastighet] is described as land in the Land Code which states that “Real property is land. This is divided into property units.”⁹³

Ownership in real property is executed in different forms; individual ownership, ownership in common and indirect ownership. A person can own a real property through individual ownership. When two or more persons acquire a real property they own the property in common.

A rather uncommon type of real property is a type existing only as shares in one or more so-called joint property units (see chapter 6, section 6.1), i.e. the real property unit does not have any physical extension itself, but exist only as a share in a joint property unit without any land of its own.⁹⁴

A real property can include land, water, buildings, utilities, fences and other facilities constructed within the real property unit intended for permanent use, standing trees and other vegetation and natural manure.⁹⁵

⁹⁰ Zweigert and Kötz (1998, pp. 276-285). Zweigert and Kötz argues “that it would be right to attribute the Nordic laws to Civil Law, even although, by reason of their close relationship and their common “stylistic” hallmarks, they must undoubtedly be admitted to form a special legal family, alongside the Romanistic and German legal families” (Zweigert and Kötz, 1998, p. 277).

⁹¹ Other provisions are e.g. the Utility Easements Act and Joint Facilities Act.

⁹² Malmström and Agell (2001), Bergström (1956).

⁹³ Land Code, chapter 1, section 1. The Land Code does not exclude water or air within the concept of land. There have been some earlier attempts to define real property, but no definition has been implemented in Swedish legislation. However, the basis for the Swedish concept of real property is found in the Land Code (Julstad, 2003, p. 87).

⁹⁴ This type of property does not have a specific name in legislation today, but is sometimes called “andelsfastighet” in Swedish literature, e.g. in Julstad (2006, pp. 458-459).

⁹⁵ Land Code, chapter 2. See Julstad (2006, pp. 450-463 and 2003, pp. 87-92).

Most real property is of the so-called traditional two-dimensional type, however three types of three-dimensional real property also exist: three-dimensional property unit [tredimensionell fastighet], which is a real property unit delimited both horizontally and vertically,⁹⁶ three-dimensional property space [tredimensionellt fastighetsutrymme], which is a space included in a real property unit other than a three-dimensional real property unit and delimited both horizontally and vertically,⁹⁷ and condominium ownership [ägarlägenhet] which is a three-dimensional real property unit not intended for other purposes than containing a single dwelling flat.⁹⁸

Indirect ownership is a form of common ownership right executed through a dwelling tenant ownership right [bostadsrätt].⁹⁹ The right holder is co-owner of the land and building(s) in which he executes a use right in a specific part of a building for dwelling purposes. All owners are members the tenant ownership association [bostadsrättsförening] (a kind of co-operative), who legally owns the building(s). The right does not give full ownership to the flat, but a dwelling right to a specific flat within the building(s). The right consists of two rights: a shared ownership right in the real property and a tenant dwelling right to a specific part or parts of the building(s).¹⁰⁰

Another type of real property unit is the sole and exclusive right to fish in certain waters. The title to the fishing right can, even if it is uncommon, be separated from the title of the land and can be part of another real property unit or exist as a real property in itself. The property is a deviation from the principle of undivided property units in Sweden.¹⁰¹ Other uncommon types of real property exist and are often remains of older legislation.¹⁰²

⁹⁶ Real Property Formation Act, chapter 1, section 1a.

⁹⁷ Real Property Formation Act, chapter 1, section 1a.

⁹⁸ Real Property Formation Act, chapter 1, section 1a. See also Paulsson (2007) for a detailed description of Swedish three-dimensional real property.

⁹⁹ The author is aware that the English term tenant ownership in some legislations contain much more than the right to use an apartment, e.g., farming rights as a tenant farmer. This is why the term dwelling tenant ownership is used in this report.

¹⁰⁰ Dwelling Tenant Ownership Act. See also Paulsson (2007, pp. 39-42).

¹⁰¹ This real property unit does not have a specific name in Swedish legislation, but is today sometimes named "fishing property" [fiskefastighet]. Julstad (2006, p. 459). Author's translation.

¹⁰² An example is older fishing rights not connected to the title of the land, e.g. the so-called jordeboksfiske, see Julstad (2006, p. 459 and 2003, pp. 88-89).

6 Investigated rights

This chapter presents the results of the four national case-studies. The investigated rights are classified according to the Legal Cadastral Domain Model, LCDM. The classification of the rights according to the LCDM is the first part of the analysis aiming at testing the model. Chapter 7 contains the second, comparative, part of the analysis.

All investigated rights could be placed in one of the LCDM classes. The case-studies have however shown that the characteristics of a few rights allow them to be placed in more than one class. These rights are here placed and described in both classes.

6.1 Common right

A common right is in the LCDM defined as a “[p]art right in a part of common land owned and shared by several real properties”.¹⁰³ Each real property owns a share of the common land. The common land is legally attached to the real properties themselves, not to the owners of the properties. When one of the real properties is sold, its share in the legally attached land follows with it. The class does not describe the situation where two or more persons own a piece of land together in common ownership. The common right is in other words a relation between two or more real properties and land legally attached to the properties.¹⁰⁴

- An executed right by two or more real properties in land owned by the properties.
- The right is transferred together with a real property when the property is sold or otherwise transferred.
- The right is similar to ownership right, but executed by real properties, not persons.
- The right can be beneficial or encumbering to ownership.¹⁰⁵

¹⁰³ Paasch (2008, p. 124).

¹⁰⁴ Paasch (2008, p. 124).

¹⁰⁵ A common right is beneficial to ownership since it allows the owners an income from the land, but can also be encumbering (i.e. limiting) to ownership if the owners have to contribute to the maintenance or management of the legally attached common land.

6.1.1 Germany

Neighbouring real property

A so-called neighbouring real property [Anliegerflurstück] is a relation between real properties and land, executed by two or more real properties legally attached to the land. A neighbouring real property can typically be a path, road or ditch intended for common use by the shareholder properties.¹⁰⁶ If one of the shareholder properties is sold, the share in the neighbouring real property unit follows with the sale.

A neighbouring real property is beneficial to ownership as it allow the use and outcome of land not accessible to others than the shareholder real properties. However, the right can also at the same time be seen as limiting to ownership since the participating real properties have to contribute to the maintenance and management of the commonly owned property.

6.1.2 Ireland

There has not been identified any common rights in the Irish legal system according to the definition in this chapter.

6.1.3 The Netherlands

Co-ownership

The Dutch case-study has identified one type of common right, the so-called common ownership [mandeligheid],¹⁰⁷ which is a relation between two or more real properties in land and “[...] a parcel of land (e.g. a common way out) attached to the ownership of neighbouring properties.”¹⁰⁸ Other examples are a dividing wall, a fence or a hedge held in common. The right has

¹⁰⁶ ALKIS (2007). This type of commonly owned real property is sometimes called Anliegergrundstück in German. The land is not registered in the Land Register as a real property, but only in the Cadastral Index Map (Liegenschaftskataster), thus obtaining a quasi status of a real property unit (Grundstück). E-mail communication with Dr. Markus Seifert, February 8th 2011.

¹⁰⁷ Civil Code, Book 5, articles 60-69. Ploeger, Velten and Zevenbergen (2005, section 1.3.1) translates mandeligheid as joint ownership. Haanappel and Mackaay (1990, p. 179) translates mandeligheid as common ownership, but mention in footnote 1 that the Dutch term is hard to translate and that another term, “mitoyennity” is sometimes used in English. Mitoyennity is a term of French origin, meaning adjoining / common / attached to.

¹⁰⁸ Ploeger, Velten and Zevenbergen (2005, section 1.3.1).

prior to 1992 only dealt with common features like walls, but has since “been expanded to all other cases of co-ownership where the ownership is inseparable from the ownership of a (nearby) parcel, e.g. a parking lot or even a whole golf course”.¹⁰⁹ If one of the shareholder properties is sold, the share in the commonly owned real property follows with the sale.

A mandeligheid is beneficial to ownership as it allows the use and outcome of land not accessible to others than the shareholder properties. However, the right can also at the same time be seen as limiting to ownership since the participating real properties may have to contribute to the maintenance and management of the legally attached land.

6.1.4 Sweden

Joint property unit

A joint property unit [samfällighet] is land legally attached to two or more real property units.¹¹⁰ A joint property unit can e.g. be used for grazing domestic animals or extracting natural resources, like timber or fish. The shares are attached to the involved real properties, not their owners. If one of the shareholder properties is sold, the share in the joint property unit follows with the sale.

A joint property unit is beneficial to ownership for the shareholder real properties as it allows the use and outcome of common land not accessible to others than the shareholders. However, the right can also at the same time be seen as limiting to ownership of the shareholder real properties since they have to contribute to the maintenance and management of the land.

6.2 Real property right

A real property right is in the LCDM defined as a “[r]ight executed by the owner of a real property (the dominant tenement) in another real property (the servient tenement), due to his ownership. The right is transferred together with the real property when the property is sold or otherwise transferred.”¹¹¹ It is a right enjoyed by one real property (the dominant tenement) over another (the servient tenement). Examples are the right of access to a

¹⁰⁹ E-mail communication with Dr. Jaap Zevenbergen, February 7th 2011.

¹¹⁰ Real Property Formation Act, chapter 1, section 3. Joint Property Unit Management Act. Julstad (2006, pp. 462-643 and 2003, pp. 90-91).

¹¹¹ Paasch (2008, p. 125).

well on another property, or for the passage of water pipelines or electricity cables. If the property is sold the right follows the property, not the previous owner. The right can be specified to be located on the whole property, to a part of the property or it can be unspecified. An example of an unspecified right is the right to drill and use a well on another property, where the geographical location of the future well is not described.

A real property right is a connection between two real properties and described by the following characteristics:¹¹²

- Right executed by the owner of a (i.e. dominant) real property in another (i.e. servient) real property.
- Right executed on the whole real property or a part of the real property.
- The right is transferred together with the real property when the property is sold or otherwise transferred.
- The right can be beneficial or encumbering to ownership right.¹¹³

Real property rights are beneficial to ownership for the dominant real property as they allow the use and benefits of the servient real property. However, the right can also at the same time be seen as encumbering (i.e. limiting) to ownership since the participating real properties have to contribute to the maintenance and management of the dominant real property and facilities they use on the real property.

6.2.1 Germany

Easement

An easement [Grunddienstbarkeit] is a property owner's right over a specific part of another property which is vested in the owner(s) of the dominant tenement, i.e. the right follows the land when the property is sold or otherwise transferred.

Easements are used for a variety of tasks, e.g. to use the road over a neighbouring property or the right to use a well on another property. The

¹¹² Paasch (2008, p. 125).

¹¹³ A real property right can be beneficial for the property dominant property, i.e. by being allowed access via a road over the servient property, and thus also being limiting for the servient real property.

right holder is the owner of the property which is executing a right (i.e. the dominant tenement) on another property (i.e. the servient tenement).¹¹⁴

The right is transferred together with the real property when the property is sold or otherwise transferred. An easement is beneficial to ownership for the dominant property and limiting to ownership for the servient property to ownership.

Fishing right

A fishing right [Fischereirecht] is the right in inland waters to use and cultivate fish, crabs, shells, frogs and other usable water living animals who are not subject of the hunting right.¹¹⁵ The right is normally attached to a real property as right for the owner of the property [Eigentümergebrauch]. A fishing right can however be sold independently as a so-called independent fishing right [selbstständiges Fischereirecht] to the owner of another real property and then becomes a right attached to the new owner's real property.¹¹⁶

The right is transferred together with the real property when the property is sold or otherwise transferred. The right can, however, also be transferred to a non-property owner, depending on regional legislation, making it a personal right, which is described in section 6.3.1. A fishing right is when classified as a real property right beneficial to ownership for the dominant property since it enhances the use or value of it and limiting for the servient real property since it limits the owners use of the property.

Charge on land

Charge on land [Reallast] is a right vested in the right holder to require recurring acts of performances to be made from the land.¹¹⁷ A charge on land is normally created for an individual, but can also be created for the benefit

¹¹⁴ BGB, sections 1018-1029. Wegen et al. (1998, pp. 215-216).

¹¹⁵ ALKIS (2007).

¹¹⁶ Fishing rights are regulated in regional acts in Germany. The description is based on the Saxon Fishing Act, section 9. E-mail communication with Mr. Volker George, December 7th 20009.

¹¹⁷ BGB, sections 1105-1112.

of the owner of a real property.¹¹⁸ The performance does not necessarily have to involve monetary compensation.¹¹⁹

The right is transferred together with the real property when the property is sold or otherwise transferred. A charge on land is beneficial to ownership for the dominant property and limiting to ownership for the servient property.

6.2.2 Ireland

Easement

An easement is a real property's (the dominant tenement) right to use a specific part of another real property (the servient tenement) for specific purposes.¹²⁰ Easements are used for a variety of tasks, e.g. to use the road over a neighbouring property or the right to use a well on another property. Some in this author's opinion peculiar rights have sometimes been claimed and recognised as easements by the Irish courts, e.g. a right to throw quarry refuse on another person's land or the right to use a blacksmith's "shoeing stone".¹²¹ An easement can even be applied on leasehold estate, i.e. the right is acquired by the lessee, which is acting as an "owner". The right passes to the landlord when the leasehold ends.¹²²

The right follows the land when the property is sold or otherwise transferred. The right is beneficial to ownership for the dominant property and limiting to ownership for the servient property.

¹¹⁸ BGB, sections 1105, part 2.

¹¹⁹ The BGB, section 1105, part 1, only mention recurring acts, in German: "[...], wiederkehrende Leistungen aus dem Grundstück zu entrichten sind (Reallast).“ However, it seems that the normal charges do have some monetary content, since the “provisions governing the interest on a mortgage claim apply with the necessary modifications to the individual payments”, BGB, section 1107. The right is translated as rent charge in Hertel and Wicke (2005, p. 36).

¹²⁰ Reform Act, part 8, sections 33-40.

¹²¹ . However, not every type of beneficiary installation can be classified as an easement. For example, a right to “shade and shelter” from a hedge has not been accepted as an easement by the Irish courts (LRC, 2002, p. 1).

¹²² Reform Act, part 8, sections 35-36.

Freehold covenant

A freehold covenant is a covenant affecting freehold land and is a relation between freehold lands, i.e. dominant and servient land.¹²³ It is an agreement restricting the owner's use and enjoyment of the property to specific purposes or it may impose a duty.¹²⁴ The covenant imposes in respect of servient land an obligation to do or to refrain from doing any act or thing.¹²⁵ Examples of covenants are the prohibition of holding dogs on an estate or using a building for specific activities (so-called negative covenant, i.e. not to do something) or to be responsible for certain maintenance on the estate (a so-called positive covenant, i.e. usually to take some action or to spend money).

The freehold covenant is transferred together with the real property when the property is sold or otherwise transferred.

Easements and freehold covenants are quite similar in nature, but whereas an easement exist as a legal right which remains enforceable against any new owner of the servient land, a freehold covenant could under Common Law cease to be enforceable if the servient land had passed to the new owner in good faith without notice of the covenant. The Reform Act has however replaced the Common Law rules on freehold covenants.¹²⁶ The right is beneficial (for the dominant property) and limiting (for the servient property) to ownership.

Profit á prendre (including a mining right)

A profit á prendre is "... [a] right or privilege to take away something of value from its soil or from the products of its soil (as by mining, logging, or hunting)."¹²⁷ The right can vested in the owner(s) of a real property or a person.¹²⁸ The right can therefore be classified as a real property right or a personal right depending on its actual content. This duality makes it a candidate for both the Real property right class and the Personal right class, depending on the actual content of the individual right in question.

¹²³ A covenant includes an agreement, a condition, reservation and stipulation (Reform Act, part 1 and part 8, section 48).

¹²⁴ Reform Act, section 49, subsection 1. Personal communication with Mr. Fergus Hayden, May 18th 2009 and e-mail communication October 15th 2010.

¹²⁵ Reform Act, part 8, section 49, subsection 2.

¹²⁶ LRC (2003, p. 7) and Reform Act.

¹²⁷ Garner (1891, p. 1013).

¹²⁸ Personal communication with Mr. Fergus Hayden, May 18th 2009. See also LRC (2003, p. 4, footnote 4).

The right follows the real property when the property is sold or otherwise transferred. The right is, if executed by a real property, beneficial to ownership for the dominant property and limiting for the servient property to ownership.

6.2.3 *The Netherlands*

Easement

An easement [erfdienstbaarheid]¹²⁹ is a real property's (the dominant tenement) right to use a specific part of another real property (the servient tenement) for specific purposes.¹³⁰ Easements are used for a variety of tasks, e.g. to use the road over a neighbouring property or the right to use a well on another property. The right allows the owner of a real property the right to use (part of) another real property for a variety of tasks, e.g. to using a road located on the real property for access to his own property.

The right follows the real property when the property is sold or otherwise transferred. An easement is beneficial to ownership for the dominant property and limiting to ownership for the servient property.

Historical real property rights

Dutch legislation has other real property rights called historical rights, dating from before the introduction of the Civil Code. The rights are considered as strong use rights. They cannot be vested anymore, but can still be transferred.¹³¹ However, numerous of them still exist in parts of the country and are still legally binding. The historical rights are mostly regional and not applied in the entire country. However, a more detailed study is necessary for classifying them individually. This study only provides a general introduction, since the rings are not in the centre of land management today.¹³²

¹²⁹ Haanappel and Mackaay (1990, p. 185) translate erfdienstbaarheid with servitude. The term is however not used in this report, since easement is deemed a more appropriate term by this author.

¹³⁰ Civil Code, Book 5, article 70 to 84.

¹³¹ Ploeger, Velten and Zevenbergen (2005, section 1.2.1).

¹³² Some examples of Dutch historical rights are; 1) the right granting the owner of a pro-property to have a duck trap on another property [recht van eendekooi]. 2) planting rights [pootrecht]. 3) an obligation where the owner of a new subdivided property has to pay a transfer fee to the owner of the land where the property is subdivided from called "right of the 13th penny" [recht van de 13 penning]. 4) the right of wind catchments / right for windmills [recht van windvang / molenrecht], which is a right allowing the owner of a windmill to keep the land around it open due to wind

The rights follow the real property when the property is sold or otherwise transferred. These historical real property rights are as a group classified as real property rights, being beneficial to ownership for the dominant properties and limiting to ownership for the servient properties, judging from the examples in the footnote below.

6.2.4 Sweden

Easement

An easement [servitut] is a real property's (the dominant tenement) right to use a specific part of another real property (the servient tenement) for specific purposes. Easements are used for a variety of tasks. Examples are the right of way over a neighbouring property or the right to use a well on another property. Easements are used for a variety of tasks, e.g. to use the road over a neighbouring property or the right to use a well on another property.¹³³ The right allows the owner of a real property the right to use (part of) another real property for a variety of tasks, e.g. to using a road located on the real property for access to his own property.

The right follows the real property when the property is sold or otherwise transferred. An easement is beneficial to ownership for the dominant property and limiting to ownership for the servient property.

Joint facility

A joint facility right [gemensamhetsanläggning] is a right for establishing a joint facility, which is a construction (facility) beneficial for two or more real property units.¹³⁴ A joint property unit is regulating the use of land, whereas a joint facility is regulating a construction (facility), hence the name. A joint property unit has to be created if the land shall follow the joint facility. A joint facility can for example be a private road, a bathing jetty or a parking area where the owners of several properties have a mutual interest in using or maintaining the facility. However, even if a joint facility is granted the

movements to the mill. In practice, the right works as an easement. Personal communication with Dr. Hendrik Ploeger, October 3rd 2005 and Dr. Jaap Zevenbergen, May 10th 2008.

¹³³ Land Code, chapter 7 and 14. Other acts also contain statutes regarding the formation and use of easements, e.g. the Real Property Formation Act and the Environmental Code. Julstad (2006 and 2003), Jensen (2005, chapter 1, section 1.3.3) and Nilson and Sjödin (2003).

¹³⁴ Joint Facilities Act.

physical space in one or several properties like an easement, the participating properties have shares reminding of the share system of a joint property unit or multiple easements in e.g. the same road or parking lot.

The rights follow the real property when the property is sold or otherwise transferred. A joint facility is beneficial and limiting to ownership. It is beneficial since the right benefits the owners of the real properties involved (which is one of the preconditions for creating a joint facility). The right is limiting because the real property owner cannot use that part of his property for other purposes than specified by the joint facility.

The joint facility is in this study classified as a real property right, since it in this author's opinion resembles a right more than the earlier described joint property unit, which is held in common by the participant properties. The space occupied by the joint facility is by this author seen as a form of common easement-like right for the participating properties.

Utility easement

A utility easement [ledningsrätt] allows a real property to use a space within a servient property for construction and maintenance of an installation used for the common good, e.g. an electric cable or a pipeline for water supply.¹³⁵ The right is normally regarded as a personal right, but can be executed by a real property.¹³⁶

The right follows the property when the property is sold or otherwise transferred. The right is, if being executed by a real property, beneficial to ownership for the dominant property and limiting to ownership for the servient property.

6.3 Personal right

A personal right is in the LCDM defined as a “[r]ight executed by a person to use, harvest the fruits/material if, rent or lease the real property in whole or in part, including the claim against a person. The right follow the property when it is sold or otherwise transferred.” A personal right can be very strong and be given on a time-limit basis or for life. Theoretically, a personal right

¹³⁵ Utility Easements Act, section 1 and 2. The Act states that the utility easement shall belong to the right holder's real property or site-leasehold if requested by the right holder.

¹³⁶ Julstad (2006, p. 471).

might also be inherited. A personal right can be beneficial (by the income of a rent to the property owner) and/or encumbering (i.e. limiting) (by allowing someone else to use one's real property) to ownership. A personal right is a connection between a person (not the owner of a property) and a real property and described by the following hypothetical characteristics:¹³⁷

- A right executed by a person other than the owner in a real property.¹³⁸
- The right to use or harvest the fruits/material of a real property, rent or lease the real property in whole or in part.
- The right follows the real property when the property is sold or otherwise transferred.
- The right can be beneficial or encumbering to ownership.

It must be noted that the general personal right of renting an apartment for dwelling or business purposes is not described in this report, even if they are common in all four investigated countries. The reason is that they are by this author seen as contractual agreements which are normally not registered in the nations land registers as separate rights.¹³⁹

6.3.1 Germany

Usufruct

German usufructs [Nießbrauch] exist in many forms depending on what area of law it is applied on, e.g. land law, finance, etc. The statutory definition of usufruct in things are; "(1) A thing can be encumbered in such a way that the person for whose benefit the encumbrance is made is entitled to take the emoluments of the thing (usufruct). (2) The usufruct may be restricted by the exclusion of individual emoluments."¹⁴⁰ It is the right for a person to use a property belonging to another to perform certain activities, e.g. to harvest "the fruits of the land".¹⁴¹ A usufruct is next to ownership the strongest right

¹³⁷ Paasch (2008, p. 125).

¹³⁸ A person may or may not be a real property owner. He is executing the right as a person, not as the owner of a certain real property.

¹³⁹ For example, the Swedish rent [hyra] and lease [arrende] can be registered in the Swedish Real Property register, but it is uncommon to do so.

¹⁴⁰ BGB, section 1030.

¹⁴¹ BGB, sections 1030-1089 (usufruct of things). Ahrens (2004).

you can have in real property.¹⁴² A usufruct applied on real property is called Grundstücksnießbrauch in German. The right can be granted for life or for a limited term. It is not allowed to alter the nature of use of the land or to transform existing buildings without permission.

The right follows the real property when the property is sold or otherwise transferred.¹⁴³ A usufruct is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give any compensation for the use of the usufruct.

Restricted personal easement

A restricted personal easement [Beschränkte persönliche Dienstbarkeit, BpD] is the right for a person to use the real property for personal gain.¹⁴⁴ A BpD is a right bestowed upon certain individuals and juridical persons and special conditions apply to juridical persons and registered groups of persons.¹⁴⁵ A BpD is similar to usufruct, but more limited in the way the person can exploit the real property in question.

The right follows the real property when the property is sold or otherwise transferred; however, the right cannot be transferred from one individual to another and expires when he/she dies. A restricted personal easement is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give any compensation for the use of the restricted personal easement.

Permanent dwelling right

A permanent dwelling right [Dauerwohnrecht]¹⁴⁶ is a use right for a specific flat on another person's real property. The right is not to be confused with the right of renting a flat. The right can be granted for the right holder's lifetime or for a fixed period. The right is executed by a person(s), the tenant(s), other than the owner of the real property. The right might be inherited, transferred or sold.¹⁴⁷

¹⁴² Ahrens (2004, p. 42).

¹⁴³ Wegen et al. (1998, p. 216).

¹⁴⁴ BGB, section 1090-1093. Wegen et al. (1998, p. 216).

¹⁴⁵ BGB, section 1092.

¹⁴⁶ Author's translation.

¹⁴⁷ Condominium Ownership Act, section 31. Wegen et al. (1998, p. 216).

The right follows the property when sold or otherwise transferred. A permanent dwelling right is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give any compensation for the use of the permanent dwelling right.

Hereditable building right

Hereditable building right¹⁴⁸ [Erbbaurecht] is a right which grants the right holder the exclusive right to build, use and occupy a building on a piece of land owned by somebody else. The right is usually granted for a fixed period, e.g. 99 years. The building right is treated as a real property and can be subject to mortgages and other land related charges. When the building right is abolished, the land owner becomes the owner of the building(s) erected by the right holder.

The right follows the real property when the property is sold or otherwise transferred. The right can be sold or inherited. When the right expires the landowner has to compensate the right holder for the building.¹⁴⁹ A specialisation of heritable building lease is the apartment-/partial building right [Wohnungs-erbbaurecht/Teilerbbaurecht] which allows the creation of a building right in an apartment or part of a real property.¹⁵⁰ A hereditable building right is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give any compensation for the use of the hereditable building right.

Mining right

A mining right [Bergwerkseigentum] is a concession to locate and extract stones, minerals, etc on a specific location. The right is very strong and equals land ownership and the content of the BGB concerning real property ownership also applies to the mining right.¹⁵¹

¹⁴⁸ Translated in Hertel and Wicke as “building lease” (Hertel and Wicke, 2005, pp. 9-10).

¹⁴⁹ Hereditable Building Right Act. Wegen et al. (1998, p. 216). Author’s translation.

¹⁵⁰ Condominium Ownership Act, section 30. Seiler (2008, p. 960), ALKIS (2007).

¹⁵¹ Mining act, section 8 and 9. Note: The name Bergwerkseigentum means mining ownership. The term Bergwerksrecht (mining right) is used in ALKIS (2007). Author’s translation.

The right follows the real property when the property is sold or otherwise transferred. A mining right is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give any compensation for the use of the mining right.

Fishing right

A German fishing right [Fischereirecht] has been classified as a real property right in section 6.2.1, but can even be classified as a personal right if the regional legislation allows it to be sold to a person. A fishing right can be sold independently as a so-called independent fishing right [selbstständiges Fischereirecht] to the owner of another real property (and then becomes a right attached to the new owners real property) or a third party (person). There are however several restrictions in regard to selling to non-property owners. It is the policy (in Saxony) not to create new independent fishing rights and over time to (re)unite the old, personal rights to real properties, thus extinguishing the rights.¹⁵²

The right follows the real property when the property is sold or otherwise transferred. A fishing right is, if executed by a person, limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give any compensation for the use of the fishing right.

Right of industry

Right of industry [Realgewerberecht], which is a hereditary use right (but not an obligation) to execute industry belonging to a specified type of business on the real property.¹⁵³

The right follows the real property when the property is sold or otherwise transferred. The right of industry is beneficial to ownership, since it allows the establishing of industry on the right holder's real property, which might not be allowed on other properties. However, the right also becomes limiting

¹⁵² The text is based on Bavarian and Saxon fishing legislations. It is even possible that there exist several fishing rights on a parcel [so-called Koppelfischereirechte], which can be sold separately. E-mail communication with Dr. Markus Seifert, February 7th 2011, and Mr. Volker George, February 28th, 2011. However, many regional conditions concerning fishing rights exist and are not analysed further in this study.

¹⁵³ ALKIS (2007).

to ownership if the right holder has to give any compensation for the use of the right.

Charge on land

Charge on land [Reallast] is a right vested in the right holder to require recurring acts of performances to be made from the land.¹⁵⁴ A charge on land is normally created for an individual, but can also be created for the benefit of the owner of a real property.¹⁵⁵ The performance does not necessarily have to involve monetary compensation.¹⁵⁶

The right follows the real property when the property is sold or otherwise transferred. A personal charge on land is limiting for the property since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give any compensation for the charge on land.

North Friesian building right

A North Friesian building right¹⁵⁷ [Stavenrecht] is a right similar to a hereditable building right and executed in the German North Friesian regions by the North Sea. The right allows the construction and use of buildings on dikes in the marshes and is similar to a hereditable building right.¹⁵⁸

The right follows the real property when the property is sold or otherwise transferred. The right is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give any compensation for the use of the building right.

¹⁵⁴ BGB, sections 1105-1112.

¹⁵⁵ BGB, section 1105, part 2.

¹⁵⁶ The BGB, section 1105, part 1, only mention recurring acts, in German: "[...], wiederkehrende Leistungen aus dem Grundstück zu entrichten sind (Reallast).“ However, it seems that the normal charges do have some monetary content, since the “provisions governing the interest on a mortgage claim apply with the necessary modifications to the individual payments”, BGB, section 1107. The right is translated as rent charge in Hertel and Wicke (2005, p. 36).

¹⁵⁷ Author’s translation.

¹⁵⁸ Nawotki (2004) and ALKIS (2007). E-mail communication with Dr. Markus Seifert, March 30th 2009. The similarity to a hereditable building right has also been noted in Nawotki (2004).

6.3.2 Ireland

Leasehold

An Irish leasehold estate is, as described in section 5.2.1, part of the concept of a legal estate, together with freehold. However, even if leasehold is treated as a form of real property, it is conceptually to be seen as a right between the owner of property and the lessee, due to the fact that leasehold does not involve the right of unlimited possession in time which is one of the characteristics of ownership as described in section 3.1. Even if the lease is very long, e.g. 999 years, and might in many ways be treated as ownership, the land will return to the owner when the lease ends. Leasehold is therefore in this study considered a personal right.

The right follows the real property when the property is sold or otherwise transferred. The right is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, a lease involves compensation to the real property owner and therefore also beneficial to ownership.

Profit á prendre (including a mining right)

A profit á prendre is, as previously described in section 6.2.2, the right to take away something of value from another persons land. The right can be executed by both a real property or a person and can therefore be classified as belonging to both the real property right class and the personal right class, depending on who is executing the right.

The right follows the real property when the property is sold or otherwise transferred. A profit á prendre is, when being a personal right, limiting to ownership for the real property, which is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give any compensation for the profit á prendre.

Wayleave or other right to lay cables, pipes, wires or other conduits

A wayleave or other right to lay cables, pipes, wires or other conduits are rights allowing the erection of certain constructions on a real property. These rights are commonly owned by utility bodies providing services like the supply of electricity, gas and water, but are nonetheless considered easements; even they are listed as a separate group in the Reform Act.¹⁵⁹ How-

¹⁵⁹ Reform Act, part 2, section 11, and the Explanatory Memorandum of the Reform Act, and personal communication with Mr. Fergus Hayden, May 18th 2009.

ever, they are in this study judged to belong to the personal right class, due to their characteristics.

The rights follow the real property when the property is sold or otherwise transferred. The right is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give any compensation for the wayleave, etc.

Rent payable under a tenancy

A rent payable under a tenancy is the rent the lessee has to pay for his tenancy. The right is registered when the tenancy is a lease and created for more than 21 years.¹⁶⁰ The entry in the leasehold register then refers to the rent.¹⁶¹

The right follows the real property when the property is sold or otherwise transferred. The right is limiting for the serving real property since the owner is forced to tolerate certain conditions. However, the right is also beneficial to ownership since it generates an income for the owner.

Rentcharge

A rentcharge is any annual or periodic sum charged on or issuing out of land, except a rent payable under a tenancy, see above, and interest.¹⁶² The creation of most new rent charges has been abolished through the introduction of the Reform Act.¹⁶³

The right follows the real property when the property is sold or otherwise transferred. A rentcharge is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. The right is however also beneficial to ownership since it generates an income for the owner.

¹⁶⁰ Registration of Title Act, 1964, section 69.

¹⁶¹ E-mail communication with Mr. Fergus Hayden, April 4th 2011.

¹⁶² Reform Act, part 1, chapter 3. Reform Act, section 3, chapter 2, sections 41-42. Note: "Moneys worth" is a value other than cash such as bonds, shares, securities, property, produce of the land, etc. Personal communication with Mr. Fergus Hayden, May 18th 2009.

¹⁶³ Reform Act, section 12 (abolishing of free farm grants) and section 41 (abolishing of rentcharges). E-mail communication with Fergus Hayden, August 11th 2010.

6.3.3 *The Netherlands*

Building lease, emphyteusis

A building lease, emphyteusis [erfpacht] is a right allowing the holder of the right to detain and to use the immovable thing of another person.¹⁶⁴ The right was originally indented to further the development of wasteland into agricultural land, but after 1900 it gained in popularity for the use of building houses and industrial buildings. The owner of the land is also the owner of all the buildings etc. constructed by the lessee [erfpachter]. The building lease can be established for a limited time, or for perpetually. The right is still also used for agricultural leasehold. However, the right of the latter on both land and constructions is considered to be very strong, almost equal to ownership itself.

The right follows the real property when the property is sold or otherwise transferred. The right may be transferred to others, however, certain conditions apply. The Dutch municipalities have previously used building lease quite intensively, but it is only in limited use nowadays, due to political reasons.¹⁶⁵ Before 1992 the lessee had to pay a yearly sum, but today the lessee can also pay a lump sum, e.g. for 50-75 years.¹⁶⁶ A building lease is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right is also beneficial to ownership since the right holder has to give compensation for the building lease.

Building lease, superficies

Building lease, superficies [opstal]¹⁶⁷ is another form of building lease giving the right to own or to acquire buildings, works or plantations in, on or above an immovable thing belonging to another. The right to own a building on land may be granted in real property as an independent right, but can also be granted in conjunction with the right to use the land under a leasehold agreement. An opstal is established when the use rights of the lessee (opstaller) regarding the land itself are limited. Examples are pipelines and (underground) cables, antennas and electricity substations.¹⁶⁸ The main use of the right is together with right of tenancy (pacht) of agricultural land to own

¹⁶⁴ Civil Code, Book 5 article 85 to 100.

¹⁶⁵ See Ploeger, van Velten, and Zevenbergen (2005, section 1.5) and Slangen and Wiggers, E. (1998, p. 359) for descriptions of building lease, emphyteusis.

¹⁶⁶ Personal communication with Dr. Jaap Zevenbergen, May 10th 2008.

¹⁶⁷ Civil Code, Book 5 article 101 to 105.

¹⁶⁸ See Ploeger, van Velten, and Zevenbergen (2005, section 1.5) and Slangen and Wiggers (1998, pp. 361-362) for descriptions of building lease, superficies.

the installations on the land you rent (in opposite to *erfpacht*, where you lease¹⁶⁹ the buildings, see above). The opstal right allows the owner of the property to charge a rent from the right holder, payable due to the conditions mentioned in the contract. A building lease can be granted for a fixed or indefinite period and is transferable, unless the deed requires the prior approval of the property owner.

The right follows the real property when the property is sold or otherwise transferred. A building lease, superficies, is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also is beneficial to ownership since the right holder has to give compensation for the building lease.

Qualitative obligation

Qualitative obligation [kwalitatieve verplichting]¹⁷⁰ is a contract between the owner of a real property and another person, in which the owner takes on an obligation not to do or to tolerate something on his land. The right also covers other registered rights [overig zak. Genotsrecht] of undisturbed possession, which are similar to contractual restriction, in the land register.¹⁷¹

The right follows the real property when the property is sold or otherwise transferred. Qualitative obligation is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give compensation for the qualitative obligation.

¹⁶⁹ It might be discussed if “lease” is the right word to use. However, the lessee is not the owner of the building. In some cases, before 1992, the holder of the *erfpacht* also explicitly got an opstal right, because of the compensation when the right ends. In this case he is the *erfpachter* of the land and (as *opstaller*) owner of the building on it. Personal Communication with Dr. Jaap Zevenbergen and Dr. Hendrik Ploeger, October 3rd and 4th 2005.

¹⁷⁰ Civil Code, Book 6, article 252. The right does not have a specific name, but is called *kwalitatieve verplichting* in Dutch. The term qualitative obligation is used in Ploeger, van Velten, and Zevenbergen (2005, section 1.3.6).

¹⁷¹ E-mail correspondence with Dr. Jaap Zevenbergen, January 12th 2009.

Usufruct

A usufruct is a right to use property belonging to another and to enjoy the fruits thereof.¹⁷² There are different types of usufructs; “Normal” usufruct [vruchtgebruik] and the right of use and habitation [recht van gebruik en bewoning]. The “normal” usufruct can be sold or mortgaged. The right can be sold again and again, but when the first seller (which the right is originally granted to) dies, the right ceases to exist. The right of use and habitation [recht van gebruik en bewoning] is strictly personal and only granted to individuals and cannot be sold or mortgaged. The right allows the use of “things” (e.g. land) and the right to use a dwelling.¹⁷³

The right follows the real property when the property is sold or otherwise transferred. Usufruct is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give compensation for the usufruct.

Beklemrecht

Beklemrecht is a right to use and enjoy the fruits and profits of the property of another. The right is a so-called old property right [oud-zakelijke recht] with regional occurrence, e.g. the stadsmeierrecht (a kind of lease) issued by the City of Groningen.¹⁷⁴

The right follows the real property when the property is sold or otherwise transferred. Beklemrecht is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial to ownership if the right holder has to give compensation for the beklemrecht.

Hire-purchase right

The hire-purchase right [huurkoop]¹⁷⁵ is a right where the lessee pays instalments for the property he leases until the ownership is transferred to him. The ownership of the real property is first transferred when the payment is

¹⁷² Civil Code, Book 3, article 201 to 226.

¹⁷³ Personal communication with Dr. Hendrik Ploeger, October 3rd 2005. See also the Civil Code, Book 3, article 226, and Ploeger, van Velten, and Zevenbergen (2005, section 1.3.1).

¹⁷⁴ E-mail communication with Dr. Hendrik Ploeger, January 21st 2009 and Dr. Jaap Zeevenbergen, January 12th 2009.

¹⁷⁵ Hire-purchase Act.

completed. A deed is needed when the last instalment is paid and the ownership is transferred to the new owner.¹⁷⁶

A hire-purchase right is by this author judged to be beneficial to ownership, since it gives the real property owner an income until the ownership is transferred to the right holder. The right is however at the same time limiting to ownership, since the owner of the real property is forced to tolerate certain conditions, i.e. not able to sell the property to others. The Dutch hire-purchase right is a hybrid of ownership right and mortgage. The right is in fact a very slow real property transaction and will grow into ownership for the lessee when the payment is completed. The right last until the payment has been completed and the original owner will then have transferred his ownership title.¹⁷⁷

The right differs from the personal rights characteristic that a personal right is transferred when the real property is sold or otherwise transferred, since the right seize to exist when the property is sold, i.e. all payments are completed by the right holder, thus becoming the new owner. The right is by this author seen as limiting to ownership, since the owner of the real property is forced to tolerate certain conditions, e.g. not to sell the real property to others. The right is however at the same time beneficial to ownership since it generates an income for the owner until the transaction is completed.

Right of land rent

Right of land rent [recht van grondrente] is a right to payment or other performances executed by the owner of the land. The right was abolished in 1992 by the introduction of the Civil Code and cannot be granted anymore, but still exist. The right is a so-called old property right [oud-zakelijk recht] and hardly used any more. It resembles the German charge on land.¹⁷⁸

A right of land rent is limiting for the real property since the owner is forced to tolerate certain conditions. However, the right is also beneficial to ownership since the right holder has to give compensation (i.e. a land rent).

¹⁷⁶ The right does not require registration, but can be registered in public registers specified in the Civil Code, Book 3, article 2. See the Hire-purchase Act, article 2.

¹⁷⁷ Personal communication with Dr. Jaap Zevenbergen, May 10th 2008.

¹⁷⁸ E-mail communication with Dr. Hendrik Ploeger, January 21st 2009.

6.3.4 Sweden

Site leasehold

Site leasehold [tomträtt] is a right to use (a specified part of) a real property which by the creation of the site leasehold is owned by the State, a municipality or otherwise in public possession.¹⁷⁹ The right is granted for an undefined period of time, but can be cancelled after certain intervals by the property owner if certain conditions apply. Site leasehold is a very strong right, almost equal to ownership and can be sold on the open market. The grantee owns the buildings on the site-leasehold.

The right follows the real property when the property is sold or otherwise transferred. The right expires when the right holder purchases the land covered by the leasehold. Site leasehold is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right holder has to give compensation for the site leasehold to the real property owner, making the right also beneficial to ownership.

Public road right

Public road right [vägrätt] is a right where the road manager (State or municipality) is granted the use of (parts of) real properties for construction and maintenance of public roads.¹⁸⁰ The right holder, in principle, takes over (almost) all ownership rights from the property owner. The right holder takes the owners place and may allow certain constructions within the road area.¹⁸¹ The right is granted to ensure control of land occupied or used in the construction and maintenance of public roads.

The right follows the real property when the property is sold or otherwise transferred. A public road right is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also is beneficial for the real property owner if the right holder has to give any compensation for the right.

¹⁷⁹ Land Code, chapter 13. Julstad (2006, pp. 473-474).

¹⁸⁰ Roads Act, sections 1 and 30-32.

¹⁸¹ Roads Act, section 30. Julstad (2006, p. 475).

Utility easement

Utility easement [ledningsrätt] is a right allowing a person to use a space within the property for construction and maintenance of an installation used for the common good, e.g. an electric cable or a pipeline for water supply.¹⁸²

A utility easement is normally executed by a legal person, but the right can also be executed by a real property, thus becoming a real property right.¹⁸³ A utility easement can also be executed by site leasehold, i.e. a right is executing a right.¹⁸⁴ In that case we have a right in a right relation, where the site-leasehold substitutes the real property in which the utility easement is granted.

The right follows the real property when the property is sold or otherwise transferred. A utility easement is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right is also beneficial for the real property owner if the right holder has to give any compensation for the right.

Leasehold

Leasehold [arrende] is a use right for the right holder to access (mostly domestic) buildings or (mostly agricultural) land, giving a financial compensation to the owner. Leasehold on land for dwelling can be granted for life. Leasehold can be granted for up to 50 years, unless it is within a planned area or agricultural leasehold, where the leasehold can be granted for no more than 25 years.¹⁸⁵

The right follows the real property when the property is sold or otherwise transferred. Leasehold is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, leasehold is also beneficial for the real property owner since the right holder has to give compensation for the right.

¹⁸² Utility Easements Act.

¹⁸³ Julstad (2006, p. 471).

¹⁸⁴ Utility Easements Act, section 1.

¹⁸⁵ Land code, chapters 8 -10. Julstad (2006, pp. 472-473). The condition is that the rights are protected by registration; otherwise the right may disappear with the sale of the property in good faith. Author's translation of the leasehold names.

Nature conservation agreement

A nature conservation agreement [naturvårdsavtal] is an agreement between the State or municipality and the property owner, pledging the owner to allow or endure certain natural values (such as plants, etc.) in a described area.¹⁸⁶ The right can be seen as a complement to nature reserves and other nature conserving initiatives. However, the right is seen as a use right by the legislator even if it resembles and complements public regulations such as nature reserves.¹⁸⁷

The right follows the real property when the property is sold or otherwise transferred. A nature conservation agreement is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial for the real property owner if the right holder has to give any compensation for the right.

Mining concession

A mining concession [undersöknings- och bearbetningskoncession] is a right to search for and exploit a land area for the purpose of mining minerals.¹⁸⁸ The right does not cover the minerals themselves, which are not owned by anyone, but only the right to extract them via investigation and necessary constructions on specific properties. The minerals can e.g. be extracted from mines with tunnels reaching under real properties not covered by the concession.

The right follows the real property when the property is sold or otherwise transferred. An investigation and exploitation concession is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, the right also becomes beneficial for the real property owner if the right holder has to give any compensation for the right.

Historical personal rights

The right to electrical power [rätt till elektrisk kraft] and “avkomsträtt” are older rights not granted anymore. They are called historical rights by this author. The right to electrical power for lightning, etc. is a right granted to a real property. It is in each right specified from which power station the

¹⁸⁶ Land Code, chapter 7, section 3.

¹⁸⁷ SOU (1998, section 4.4).

¹⁸⁸ Minerals Act. See Johnson (2010) for an overview of Swedish mineral legislation.

power has to be taken and which real property receiving it.¹⁸⁹ Avkomsträtt is a right for a person to receive benefits in form of money or goods from a real property. The typical scenario is a son taking over his parent's farm and granting them the right to stay on the property and/or other services.¹⁹⁰

The rights follow the real property when the property is sold or otherwise transferred. The right to produce electrical power is an limiting to ownership since the real property owner has to pay for the service. However, the right is also beneficial to ownership, since the right allows the right holders property to receive specific services (electrical power) from a power station. Avkomsträtt is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, an avkomsträtt also becomes beneficial to ownership if the right holder has to give any compensation, e.g. to perform some duties in exchange for the right.

6.4 Latent right

A latent right is in the LCDM defined as “[a] right which is not yet executed on a real property. Regulating the exploitation of a real property by another real property or person. When the real property is sold or otherwise transferred the right normally follows with it. Liens are not considered latent rights.”¹⁹¹ A latent right is a common right, a real property right or personal right which is not yet executed on a real property. The right normally follows with the real property when the property is sold or otherwise transferred. Liens are in the LCDM not considered latent rights, according to the definition used in the LCDM.¹⁹² When executed, the latent right will be classified as e.g. a beneficial or limiting personal right or real property right depending on its characteristics. The right is described by the following characteristics:¹⁹³

¹⁸⁹ Land Code, chapter 15, section 1.

¹⁹⁰ See Landahl and Nordström (1973, p. 502).

¹⁹¹ Paasch (2008, p. 126). Note: Spelling error in the definition, saying “exploration” instead of “exploitation”. Corrected in this report.

¹⁹² Paasch (2008, p. 126).

¹⁹³ Paasch (2008, p. 126). Note: Spelling error in the characteristics, saying “exploration” instead of “exploitation”. Corrected in this report.

- A latent right waiting to be executed on or by a real property.
- Regulating the exploitation of a real property by another real property or person.
- When a real property is sold or otherwise transferred the right normally follows with it.
- The right will be classified as a common right, real property right, personal right, public regulation or public advantage when executed, depending on its specific characteristics.
- The right can be beneficial or encumbering to ownership.¹⁹⁴
- The right does not contain security for payment and other financial interests, such as mortgage. These rights are placed in the lien class.

6.4.1 Germany

Pre-emption right

A pre-emption right [dingliches Vorkaufsrecht]¹⁹⁵ is a right granted the right holder to purchase a property in question (or a fraction of it) when it is put up for sale. The right can be given as a personal right or to the owner of another real property.¹⁹⁶

The right normally follows the real property when the property is sold or otherwise transferred, i.e. a pre-emption right still exist when the new owner want to sell the real property. The right is, when executed by a real property, beneficial to ownership of the dominant real property. The right of pre-emption is, when executed by a person, limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. The right may also be limiting the dominant real property if there are transaction costs to be paid in connection with the transfer of ownership based on the pre-emption right.

¹⁹⁴ Depending on the specific characteristics the right will be transformed into a real property right, personal right or lien when executed.

¹⁹⁵ The right of pre-emption is regulated in the BGB, sections 463-473. Right of pre-emption to land is regulated in BGB, sections 1094-1104. Other rights of pre-emption are e.g. 1) municipal pre-emption right [gesetzliches Vorkaufrecht], 2) public pre-emption right [öffentliches Vorkaufsrecht] and 3) a pre-emption right in a hereditary building right [Vorkaufrecht beim Erbbaurecht]. Note: Right of pre-emption also exists between co-heirs when one of the co-heirs decides to sell his share of the estate (BGB, section 2034). The right is in Wegen et al. (1998, p. 217) translated as right of first refusal, whereas Hertel and Wicke (2005) uses the term pre-emption right.

¹⁹⁶ BGB, section 1094, part 1 (person) and part 2 (real property owner).

6.4.2 Ireland

Right of entry or of re-entry attached to a legal estate

The right of entry is “[...]a right to take possession of land or of its income and to retain that possession or income until some obligation is performed”.¹⁹⁷ An example is when “[...] X may grant a fee simple to A, but include a condition that if Dublin ceases to be the capital city of Ireland, X or some other person may exercise a right of entry or re-entry.”¹⁹⁸

The right of re-entry is a right for a landlord to enter the property due to e.g. mismanagement by the lessee. The exercise of such a right results in the lessee’s interest being forfeited. To avoid breaking laws against forcible entry, both rights are often exercised after a court order has been obtained.¹⁹⁹

The rights follow the real property when the property is sold or otherwise transferred. The rights of entry or of re-entry [...] are beneficial to ownership to ownership, since the owner can execute an access right due to certain conditions. The rights may also be limiting to ownership if there are costs to be paid in connection with the establishment or execution of the access rights based on the court order.

Possibility of reverter

A possibility of reverter is a possibility that a freehold estate might revert to a grantor or his successors at some time in the future.²⁰⁰ It applies to estates known as “determinable fees” and is quite rare.²⁰¹ An example is when person A grants freehold land to person B and his successor until Ireland leaves the European Union. When (if) Ireland would do that, the land goes back to person A or his successors.²⁰² When it is certain that land will revert, it is referred to as a reversion or reversionary interest. The holder of such an interest is the legal owner of a superior interest, into which the other interest will ultimately merge. It is a rather special area and the main rule is that the property goes back to the previous owner when something special happens.

¹⁹⁷ Reform Act, section 3.

¹⁹⁸ The example is used in the Explanatory Memorandum of the Reform Act, p. 6.

¹⁹⁹ Reform Act, part 1, section 3 and personal communication with Mr. Fergus Hayden, May 18th 2009.

²⁰⁰ Reform Act, part 3, section 15.

²⁰¹ Personal communication with Mr. Fergus Hayden, May 18th 2009.

²⁰² Example provided by Mr. Fergus Hayden, May 18th 2009.

The right is not considered a personal right in Irish legislation but a possible or contingent interest in land.²⁰³

The right follows the real property when the property is sold or otherwise transferred. The right is beneficial to ownership since the owner can execute an access right due to certain conditions. The right may also be limiting to ownership if there are transaction costs to be paid to the owner in connection with the transfer of ownership.

6.4.3 *The Netherlands*

Pre-emption right

A pre-emption right [voorkeursrecht] can be executed in different ways; through municipal pre-emption rights and through private pre-emption agreements based on contracts. A municipal pre-emption right [Wet voorkeursrecht gemeenten] can be executed by a municipality on real property for sale within their boundaries as long as the municipality claims the right (allowed in relation to different planning decisions) before the sale. The right gives the municipality the right to buy a real property regardless of any other potential buyers. A pre-emption is a right not only restricted to the benefit of a municipality, but can also be established by contract between two persons. A personal pre-emption right cannot, in principle, be registered in the public registers. However, some rights can be registered, especially in relation to the municipal pre-emption legislation.²⁰⁴

The right follows the real property when the property is sold or otherwise transferred. The municipal pre-emption right is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. The right may also be beneficial to ownership if there are transaction costs to be paid to the owner in connection with the transfer of ownership.

²⁰³ Personal communication with Mr. Fergus Hayden, May 18th 2009.

²⁰⁴ Municipal Pre-emption Rights Act (WVG). Zevenbergen, Ferlan and Mattsson (2007, pp. 264 - 267).

6.4.4 Sweden

Duty to offer for purchase

Duty to offer for purchase [hembudsskyldighet] is an obligation to offer the leaseholder of an agricultural real property the property for purchase before it is sold to others. However, the leaseholder has to announce an interest in the real property.²⁰⁵

The right follows the real property when it is sold or otherwise transferred. The right is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions, i.e. he may not sell the real property to others. The right may also be beneficial to ownership if there are transaction costs to be paid to the owner in connection with the transfer of ownership.

6.5 Lien

A lien is in the LCDM defined as “[a] latent, financial security for payment.”²⁰⁶ A general example is a mortgage, which is a financial security granted by an owner of a real property to a person, normally a financial institution.

The liens identified in the case-studies are mostly mortgages and land charges. A mortgage is described as “[a] conveyance of title to property that is given as security for the payment of a debt or the performance of a duty and that will become void upon payment or performance according to the stipulated terms” and “[a] lien against property that is granted to secure an obligation (such as debt) and that is extinguished upon payment or performance according to stipulated terms.”²⁰⁷ A (land) charge is described as to impose a lien or claim or charge the land with a tax lien.²⁰⁸

The right holder may in many legal systems authorize a forced sale of the real property if the mortgagee does not fulfil the specified financial obligations. A lien might be seen as a latent right, but is in this model described as a separate class because of its strong financial content. A lien is a connection between a financial right or interest that a creditor has and a real property. Lien is described by the following characteristics:²⁰⁹

²⁰⁵ Lessee’s Pre-emption Act.

²⁰⁶ Paasch (2008, p. 127).

²⁰⁷ Garner (1891, p. 847).

²⁰⁸ Garner (1891, p. 192).

²⁰⁹ Paasch (2008, pp. 126-127).

- A legal right or interest that a creditor (person or real property) has in another's real property.
- Lasting usually until a debt or duty that it secures is satisfied.
- A latent, financial security for payment.
- The real property is used as security for payment and can be subject for forced sale.
- When executed, the Lien will be transferred to personal right or real property right depending on the type of creditor.
- The right can be beneficial or encumbering to ownership.

6.5.1 Germany

The general German term for mortgages and land charges is Grundpfandrecht,²¹⁰ which has been translated as “real security on real property”.²¹¹ These securities can be divided into mortgage, land charge and annuity land charge, which entitle the creditor to enforce payment of a monetary claim with the security in the plot of land.²¹²

Mortgage

A mortgage [Hypothek] is an instrument for security real property.²¹³ Mortgage is the main type of security in land and loans may be validly created only as security for a specific obligation and is primarily granted by mortgage banks, savings- and commercial banks which grant security in land. Once the debt is repaid the mortgage falls away and cannot be used again for another security in the real property.²¹⁴ However, the mortgage can then be transferred into a land charge, see below, and can be re-used as security for another loan.²¹⁵

²¹⁰ Hertel and Wicke (2005, p. 36) and Müller (1988, pp. 382-383).

²¹¹ Hertel and Wicke (2005, p. 36).

²¹² BGB, sections 1113-1190 (Mortgage, land charge and annuity land charge. See Kessal-Wulf (2008), Hertel and Wicke (2005, p. 36), Wegen et al. (1998, pp. 229-230).

²¹³ BGB, section 1113.

²¹⁴ The German term is “akzessorisch”, i.e. collateral. See Hertel and Wicke (2005, pp. 36 – 45), Wegen et al. (1998, p. 229) and Müller (1988, p. 382) for descriptions concerning the use of mortgages.

²¹⁵ Müller (1988, p. 383).

A mortgage is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, a mortgage can also be beneficial to ownership if it generates lower financial costs by using the real property as security instead of obtaining the loan by other means. A security can generate lower interest costs.

Land charge

A land charge [Grundschild] is a right allowing the right holder the payment of a specific sum of money from a piece of land.²¹⁶ A land charge works in the same way as a mortgage, but may be created without any specific claim or obligation. The right does not automatically cease to exist when the loan is repaid and can therefore be re-used for another loan or by another creditor who has acquired the land charge.²¹⁷ A land charge can be transferred into a mortgage or an annuity land charge.²¹⁸

A land charge is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, if the right holder has to give any compensation for the right, the right also becomes beneficial for the real property owner.

Annuity land charge

An annuity land charge²¹⁹ [Rentenschuld] is a land charge where the property owner has to make regular payments to the right holder but can choose to pay a lump sum instead.²²⁰ An annuity land charge can be transferred into a land charge.²²¹

An annuity land charge is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, if the right holder has to give any compensation for the right, the right also becomes beneficial for the real property owner.

²¹⁶ BGB, section 1191.

²¹⁷ Wegen et al. (1998, p. 229).

²¹⁸ BGB, section 1198 (land charge to mortgage and vice/versa) and BGB, section 1203 (land charge to annuity land charge and vice/versa).

²¹⁹ BGB, section 1199.

²²⁰ Hertel and Wicke (2005, p. 36).

²²¹ BGB, section 1203.

6.5.2 Ireland

Mortgage

Mortgage is an instrument for security in registered real property and certain rights (e.g. a registered lease). The right is intended to provide security against others for a claim for payment of a sum of money, with preference over other creditors.²²²

A mortgage is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, a mortgage can also be seen as being beneficial to ownership by generating lower financial costs by using the real property as security instead of financing a loan by other means. A security can generate lower interest costs.

Other lien

Ireland has had different other forms of liens which can be registered.²²³ Examples are a rentcharge, where an annual sum is paid by the owner of a freehold estate to a person who has no legal interest in the land or any judgment mortgage, recognizance, State bond, inquisition, etc. whether existing before or after the first registration of the land. Furthermore, the creation of so-called free farm rents has been abolished through the introduction of the Reform Act.²²⁴

These other liens are limiting to ownership, since the owner of the real property are forced to tolerate certain conditions. However, they can also be seen as being beneficial to ownership if the real property owner receives some benefits from e.g. paying a rentcharge or free farm rent.

6.5.3 The Netherlands

Mortgage

Mortgage [hypotheek]²²⁵ is an instrument for security in registered real property and certain rights (e.g. a building lease on land).²²⁶ The right intends to

²²² Reform Act, sections 89-111.

²²³ See the Registration of Title Act, 1964, section 69.

²²⁴ Reform Act, section 12 (abolishing of free farm grants) and section 41 (abolishing of rentcharges). E-mail communication with Fergus Hayden, August 11th 2010.

²²⁵ The term mortgage is used in Ploeger, Velten, and Zevenbergen (2005) and Slangen and Wiggers (1998), whereas hypotheek is translated as *hypothec* in Haanappel and Mackaay (1990, p. 98). However, mortgage has been used in this report since it seems to be the commonly accepted translation.

provide security against others for a claim for payment of a sum of money, with preference over other creditors.²²⁷

A mortgage is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, a mortgage can also be seen as being beneficial to ownership by generating lower financial costs by using the real property as security instead of financing a loan by other means. A security can generate lower interest costs.

6.5.4 Sweden

Mortgage lien

A mortgage lien [panträtt] in an instrument for security in registered real property. The right allows security for loans through mortgaging of real property and certain rights in real property (site-leasehold).²²⁸ A real property can only be mortgaged as a whole and a joint owner cannot mortgage his single share of the real property.²²⁹

A mortgage is limiting to ownership, since the owner of the real property is forced to tolerate certain conditions. However, a mortgage can also be seen as being beneficial to ownership by generating lower financial costs by using the real property as security instead of financing a loan by other means. A security can generate lower interest costs.

²²⁶ Civil Code, Book 3, article 227 to 259.

²²⁷ Civil Code, Book 3, article 227. Haanappel and Mackaay (1990, p. 98).

²²⁸ Swedish Land Code, chapter 6.

²²⁹ Julstad (2003, p. 106).

7 Comparative analysis

The purpose of this chapter is to analyse the rights investigated in chapter 6 and thereby verify or falsify the rights part of the Legal Cadastral Domain Model. The analysis focus on rights that not completely match the LCDM characteristics. Most rights fit the characteristics of the LCDM classes and are not dealt with in detail in this analysis. Suggestions for modifications of the model are placed in chapter 8.

7.1 Common right class

The case-studies have shown that the common right class can contain the rights listed in chapter 6, section 6.1 and table 7.1.

Table 7.1. National rights classified according to the LCDM common right class.

	Germany	Ireland	The Netherlands	Sweden
Common right	Neighbouring property [Anliegerflurstück]	None	Co-ownership [Mandeligheid]	Joint property unit [Samfällighet]

The studied common rights function in the same way, i.e. being relations between real properties and land legally attached to two or more real properties. However, there are minor differences worth noticing. While the co-ownership rights in the Netherlands and Germany applies to an adjacent or nearby real property (and in the Dutch case even solid objects like a fence or wall) the Swedish joint property unit applies to adjacent, nearby or -most often- distant land held in common by the real properties. The characteristics of the common right class does, however, not specify any physical distance or type of land between the properties. The distance to land is therefore of no concern for the LCDM.

The relations between person, ownership right and land via a common right are shown in figure 7.1.

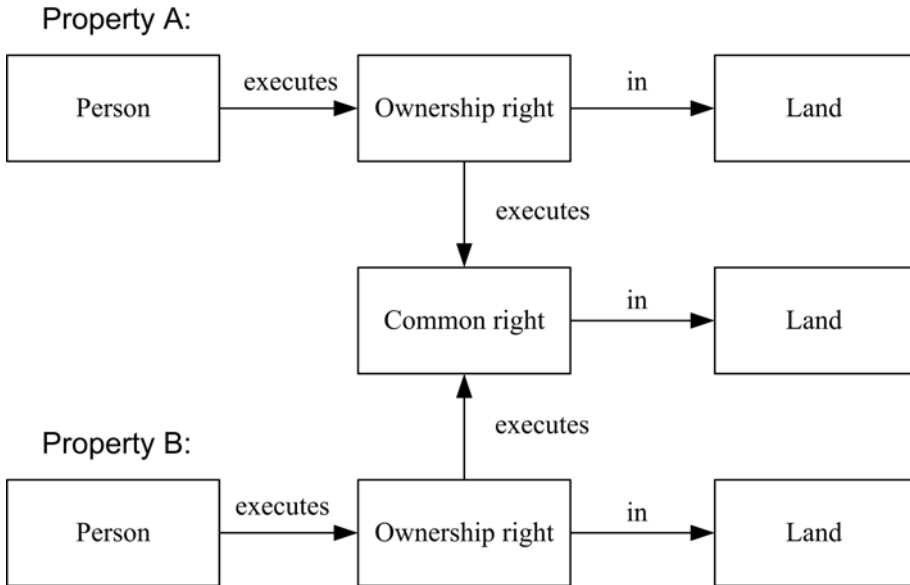


Figure 7.1. Common right model showing the relations between property A (person – ownership right – land relation) and property B (person – ownership right – land relation) through a common right.

7.2 Real property right class

The case-studies have shown that the real property right class can contain the rights listed in chapter 6, section 6.2 and table 7.2.

Table 7.2. Rights identified as belonging to the LCDM real property right class.

	Germany	Ireland	The Netherlands	Sweden
Real property right	Easement [Grunddienstbarkeit] Fishing right [Fischereirecht] Charge on land [Reallast]	Easement Freehold covenant Profit á prendre (including a mining right)	Easement [Erfdienstbaarheid] Historical real property rights	Easement [Servitut] Joint facility [Gemensamhetsanläggning] Utility easement [Ledningsrätt]

The relations between person, ownership right and land via a real property right are illustrated in figure 7.2 below.

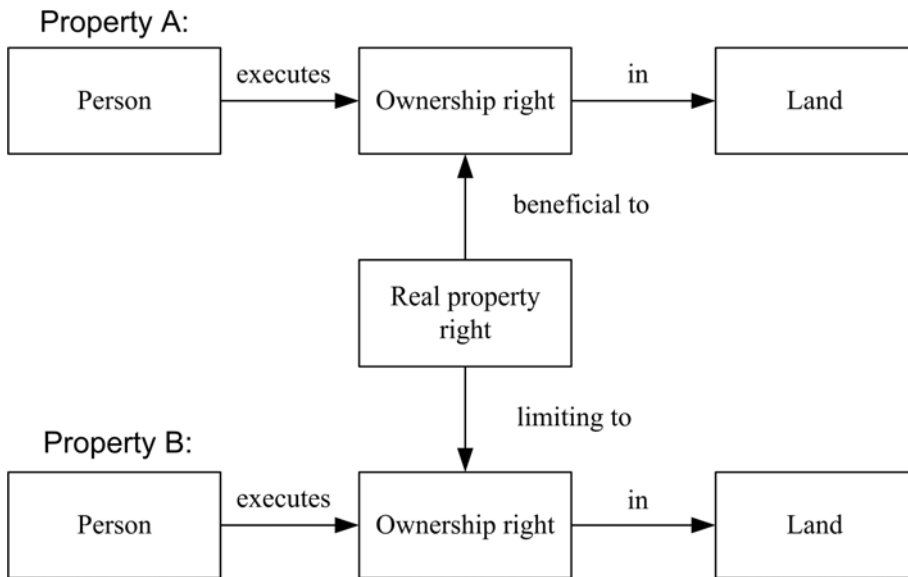


Figure 7.2. Real property right model, illustrating the relation between property A (person – ownership right – land relation, the dominant tenement) and property B (person – ownership right – land relation, the servient tenement), through a real property right.

However, the Dutch historical rights have in this report been classified as real property rights due to the characteristics of the shown examples. It is however possible that there are some historical rights which are executing e.g. a person to property relation, thereby classifying them as personal rights.²³⁰

Some of the rights are however of a “double nature”. The German charge on land, the Irish profit á prendre, and the Swedish utility easement rights can be executed as a property-to-property or person-to-property relation depending on the conditions in the specific right itself which makes the rights candidates for the real property right class and the personal right class. These rights shall be classified as real property rights if they are relations between two properties and classified as personal rights if they are relations between a person and a real property. It is, in other words, not possible to classify the

²³⁰ A deeper analysis of the institute of all registered historical rights in the investigated national legislations is necessary to make a complete classification. This is however judged to be outside the scope of this study, since they are not in the centre of land management today.

rights on a so-called feature type level (i.e. all rights of one type of right), but on the instance level (i.e. a specific right). The content of the actual right in question decides in which class the rights have to be placed.

7.3 Personal right class

The case-studies have shown that the real personal right class can contain the rights listed in chapter 6, section 6.3 and table 7.3a and 7.3b, except the Dutch hire-purchase right, see below.

Table 7.3a. Rights identified as belonging to the LCDM personal right class.

	Germany	Ireland	The Netherlands	Sweden
Personal right	Usufruct [Nießbrauch]	Leasehold	Building lease, emphyteutis [Erfpacht]	Site leasehold [Tomträtt]
	Restricted personal easement [Beschränkte persönliche Dienstbarkeit]	Profit á prendre (including a mining right)	Building lease, superficies) [Opstal]	Public road right [Vägrätt]
	Permanent dwelling right [Dauerwohnrecht]	Wayleave [...]	Qualitative obligation [Kwalitatieve verplichting]	Utility easement [Ledningsrätt]
	Hereditable building right [Erbbaurecht]	Rent payable under a tenancy	Usufruct [Vruchtgebruik]	Leasehold [Arrende]
	Mining right [Bergwerkseigentum]	Rentcharge	Beklemrecht	Nature conservation agreement [Naturvårdsavtal]
	Fishing right [Fischereirecht]		Hire-purchase [Huurkoop]	Mining concession [Undersöknings- och bearbetningskoncession]
	Right of industry [Realgewerberecht]		Right of land rent [Recht van grondrente]	Historical personal rights

Table 7.3b. Rights identified as belonging to the LCDM personal right class.

	Germany	Ireland	The Netherlands	Sweden
Personal right	Charge on land [Reallast] North Friesian building right [Stavenrecht]			

The case-studies have also shown that not all rights follow the real property when the property is sold or otherwise transferred, even if it is very common that they do. The Dutch hire-purchase right expires when the transfer (purchase) of the real property to the new owner is completed. The right differs from the personal rights characteristic that a personal right is transferred when the real property is sold or otherwise transferred, since the right cease to exist when the property is sold, i.e. all payments are completed by the right holder, thus becoming the new owner.

The relations between personal right holder, person, real property ownership right and land via a personal right are illustrated in figure 7.3 below.

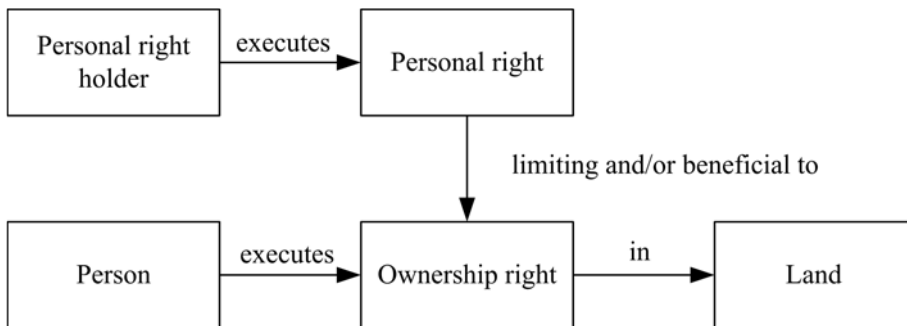


Figure 7.3. Personal right model, illustrating the relation between a personal right holder and a real property (person – ownership right – land relation) through a personal right.

Some of the rights are, as described earlier, of a “double nature”. The German charge in land, the Irish profit á prendre, and the Swedish utility easement rights can be executed as a property-to-property or person-to-property relation depending on the content of the individual right. That makes the right a candidate for both the real property right class and the personal right class. In other words, it is not possible to classify the rights on a feature type level (i.e. all rights of one type), but on the instance level (i.e. a specific right), since it is the content of the actual right in question that decides in which class the rights have to be placed.

7.4 Latent right class

The case-studies have shown that the latent right class can contain the rights listed in chapter 6, section 6.4 and table 7.4. Their characteristics match the characteristics of a latent right.

Table 7.4. Rights identified as belonging to the LCDM latent right class.

	Germany	Ireland	The Netherlands	Sweden
Latent right	Pre-emption right [Dingliches Vorkaufsrecht]	Right of entry or re-entry [...] Possibility of reverter	Pre-emption right [Voorkeursrecht]	Duty to offer for purchase [Hembudskyldighet]

The relations between latent right holder, person, real property ownership right and land via a latent right are illustrated in figure 7.4 below.

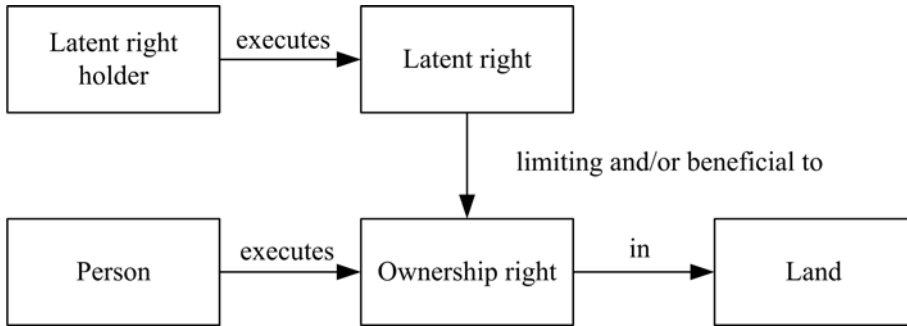


Figure 7.4. Latent right model, illustrating the relation between a latent right holder and a real property (person – ownership right – land relation) through a latent right.

7.5 Lien class

The case-studies have shown that the lien class can contain the rights listed in chapter 6, section 6.5 and table 7.5. Their characteristics match the characteristics of a lien.

Table 7.5. Rights identified as belonging to the LCDM lien class.

	Germany	Ireland	The Netherlands	Sweden
Lien	Mortgage [Hypothek] Land charge [Grundschuld] Annuity land charge [Rentenschuld]	Mortgage Other lien	Mortgage [Hypotheek]	Mortgage lien [Pantträkt]

The relations between lien right holder, person, real property ownership right and land via a lien are illustrated in figure 7.5 below.

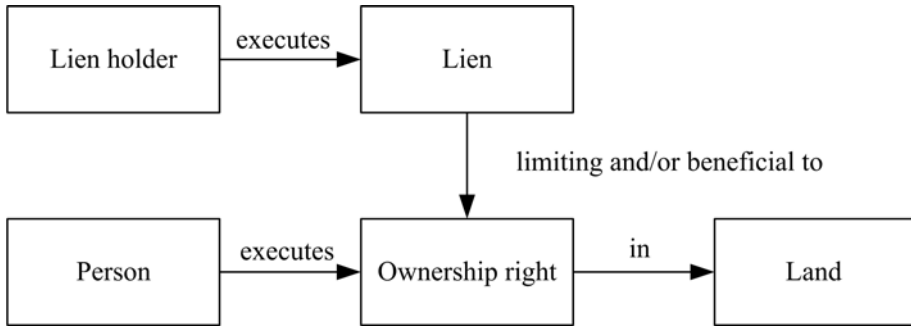


Figure 7.5. Lien model, illustrating the relation between a lien holder and a real property (person – ownership right – land relation) through a lien.

8 Conclusion, model modifications and future research

This report contains the results of four case-studies regarding a classification of real property rights in Germany, Ireland, the Netherlands and Sweden, based on the Legal Cadastral Domain Model, LCDM.²³¹ The purpose of the case-studies is to test whether the part of the LCDM describing rights influencing ownership of real property is usable for classifying real property rights registered in national registers.

It must be stressed that this report is not a judgement against other existing classification systems, but an attempt aiming at verifying a model providing a “neutral” classification of rights influencing real property ownership.

This chapter is divided into three parts: section 8.1, which contains a conclusion regarding whether the LCDM is valid; section 8.2, which contains suggestions for modifications of the model based on the results of the case-studies and other improvements based on the experiences gathered during the case-studies and section 8.3, which contains suggestions for future research.

8.1 Conclusion

The investigated rights may at first seem to be an inhomogeneous web of interests not suitable for any structured classification. However, the case-studies have shown that the rights to a high degree have the characteristics described in the LCDM and thereby placing them in one of the LCDM rights classes.

It can therefore on the basis of the case-studies be concluded that the LCDM is valid to a high degree. However, the case-studies have shown that some adjustments are necessary to make the LCDM able to encompass all investigated rights, see, section 8.2 below.

The result is also a contribution to the debate whether the Civil Law and Common Law traditions can be compared since they, as earlier described are made up of different concepts and, according to one scholar, contain “irreducible differences”.²³² The case-studies did not encounter any “irreducible differences”, but has shown that - at least small areas of - legislation (i.e. re-

²³¹ Paasch (2008 and 2005).

²³² Legrand (1996).

gistered rights influencing real property ownership) originating from different legal traditions can be compared and analysed.

Another issue to be addressed is that some of the investigated rights are of a “double nature”, i.e. the description of the specific type of right makes them candidates for the real property right class and the personal right class at the same time. It is therefore not possible to classify all rights only on the feature type level (i.e. all rights of one type of right), but only on an instance level (i.e. a specific right), since it is the characteristic of the actual right in question that decides in which class the rights have to be placed. This is however not judged to be of any concern for the LCDM on a conceptual level, but has to be taken into account if the model is used as a concept for developing existing and new real property information systems.

8.2 LCDM modifications

The comparative analysis in chapter 7 has shown that some minor modifications are necessary to make the LCDM capable of describing all investigated rights. During the case-studies the practical use of the theoretical model revealed some descriptions and choice of class names, etc., which could benefit from being modified to improve the understanding of the model.

This section is divided into three parts: section, 8.2.1 which contain necessary modifications based on the analysis in chapter 7; section 8.2.2, which contain other modifications based on experiences collected during the case-study work and section 8.2.3 listing changes in the used terminology based on experiences collected during the case-study work. The class descriptions in appendix I have been updated with the changes listed in the sections below.

8.2.1 Necessary modification of LCDM characteristics, definitions, etc.

Personal right class

The case-studies showed that a personal right not always follows the real property when the property is sold or otherwise transferred, even if it most common that they do. The characteristic in chapter 6, section 6.3 stating that the rights follow the real property when sold or otherwise transferred has therefore to be removed and the definition has to be changed in the same way. The suggested changes are listed in table 8.1 below.

Characteristics of rights

Furthermore, the case-studies have shown that a right can be limiting and beneficial to ownership at the same time. It is therefore suggested to change “and” to “and/or”. Furthermore, it would benefit the model if the wording of the characteristics in question would start with the limiting side of the right, e.g. “limiting and/or beneficial”, since the case-studies did not investigate all beneficial aspects of the rights. The suggested changes are listed in table 8.1 below.

Table 8.1. Necessary modifications in the LCDM classes.

<i>Current wording</i>	<i>Suggested wording</i>
Personal right class	
<p>“The right follows the real property when the property is sold or otherwise transferred.”</p> <p><i>Definition:</i> Right executed by a person to use, harvest the fruits/material of, rent or lease the real property in whole or in part, including the claim against a person. The right follows the property when it is sold or otherwise transferred.</p>	<p>To be removed.</p> <p><i>Definition:</i> Right executed by a person to use, harvest the fruits/material of, rent or lease the real property in whole or in part, including the claim against a person.</p>
All rights classes	
“beneficial or encumbering”	“limiting and/or beneficial”

8.2.2 Other modifications of characteristics, definitions, etc.

The modifications suggested below do not alter the content of the LCDM as such, but would make the model more easily accessible.

Common right class

The common right characteristics “an executed right by two or more real properties in land owned by the properties” and “the right is similar to ownership right, but executed by real properties, not persons” are unclear and do not clearly state that the right is a real property-to-land relation executed

in land being legally attached to two or more real properties. If the relations had been a traditional common or joint ownership there would be no need for a separate LCDM class. The LCDM could therefore benefit from having them exchanged with a new characteristic and definition emphasising that the common right class is a relation between two or more real properties and land legally attached to them. See the suggested changes in table 8.2a. Furthermore, the term “right” should be exchanged with “common” in the other characteristics, etc. in the LCDM to ensure the same terminology throughout the model.

Real property right class

The current definition of the class (“[r]ight executed by the owner of a real property (the dominant tenement) in another real property (the servient tenement), due to his ownership. The right is transferred together with the real property when the property is sold or otherwise transferred”) is longer than the other class definitions and includes the transfer of the right, which is not part of the other LCDM definitions. It is therefore suggested that the definition is shortened to not to include the transfer, since the transfer already is part of the characteristics. Furthermore, the phrases “the dominant tenement” and “the servient tenement” are not necessary for understanding the definition and are terms are limited to the cadastral domain and may be difficult to understand for others and should therefore also be removed. See the suggested changes in table 8.2b.

Latent right class

The current definition of the class is very long and includes some of the characteristics; “[a] right which is not yet executed on a real property. Regulating the exploitation of a real property by another real property or person. When the real property is sold or otherwise transferred the right normally follows with it. Liens are not considered latent rights.” It is suggested that the definition is shortened and rephrased not to include the characteristics. See the suggested changes in table 8.2b below.

Table 8.2a. Modifications of the LCDM common right class.

<i>Current wording</i>	<i>Suggested wording</i>
Common right class	
<p><i>Object:</i> An ownership relation between two or more real properties.</p> <p><i>Characteristics:</i> “An executed right by two or more real properties in land owned by the properties.”</p> <p>”The right is similar to Ownership right, but executed by real properties, not persons.”</p> <p>The right is transferred together with the real property when the real property is sold or otherwise transferred.</p> <p>The right can be beneficial or encumbering to ownership</p> <p>None.</p> <p><i>Definition:</i> “Part right in a part of common land owned and shared by several real properties.”</p>	<p><i>Object:</i> A relation between two or more real properties and land legally attached to them.</p> <p><i>Characteristics:</i> To be removed</p> <p>To be removed.</p> <p>“The common is transferred together with the real property when the real property is sold or otherwise transferred “</p> <p>The common can be limiting and/or beneficial to ownership.</p> <p>“Relation between two or more real properties and land legally attached to them.”</p> <p><i>Definition:</i> Real property to land relation executed in land legally attached to two or more real properties. Owners of the participating real properties execute co-ownership rights in the land at issue.</p>

Table 8.2b. Modifications of the LCDM real property right and latent right classes.

<i>Current wording</i>	<i>Suggested wording</i>
Real property right class	
<i>Definition:</i> “Right executed by the owner of a real property (the dominant tenement) in another real property (the servient tenement), due to his ownership. The right is transferred together with the real property when the property is sold or otherwise transferred.”	<i>Definition:</i> “Right executed by the owner of a real property in another real property, due to his ownership.”
Latent right class	
<i>Definition:</i> “A right which is not yet executed on a real property. Regulating the exploitation of a real property by another real property or person. When the real property is sold or otherwise transferred the right normally follows with it. Liens are not considered latent rights.”	<i>Definition:</i> “Right not yet executed on a real property.”

8.2.3 Modifications of terminology

There are apart from the additional modifications proposed above other issues to be addressed in order to make the model more accessible. It has in chapter 1, section 1.6, Terminology, been mentioned that the choice of an as correct as possible English terminology has given this author some concern. The case-studies have shown that some terms used in the LCDM are not consistent with their general use in the real property domain and that there are some issues which have to be addressed to make the model more clear and understandable. A proposed change of class names of some of the LCDM classes is described below.

Appurtenance class

The Irish case-study has shown that the legal term appurtenance has a special meaning in Irish legislation and is used for a right that “follows the land” when sold. The term should not therefore be used as general class name. Rights executing a person-to-property relationship are said to be “held in gros”.²³³ In English legal literature appurtenance mean “[s]omething that belongs or is attached to something else [...]”.²³⁴ It may therefore be wise to rename the appurtenant class to a name not causing misunderstandings. A suggestion is to rename the class “Beneficial right”. See table 8.3 and figure 8.1.

Encumbrance class

Furthermore, the encumbrance class may also need to be renamed in order to make it more accessible to readers with non-English legal backgrounds. A suggestion is to rename the class “Limiting right”. See table 8.3 and figure 8.1.

Common right class

The case-studies have shown that common right is somewhat inappropriate name since the content of the class are not granted rights as in the other LCDM classes, but relations between real properties and land legally attached to them. The relation is not to be seen as a common ownership right as described in chapter 4 and it would be semantically inappropriate to describe the class as real properties owning another real property. A suggestion is to change the class name to “common”. See table 8.3 and figure 8.1.

Real property right class

The name of the class may not be too well chosen. The term is in English literature often collectively used as a common name for rights in real property. To use it as a name for a specific type of right does therefore not seem appropriate.²³⁵ A suggestion is to rename the class “Property to property right”. See table 8.3 and figure 8.1.

²³³ Personal communication with Mr. Fergus Hayden, May 18th 2009.

²³⁴ Garner (1891, p. 84).

²³⁵ The somewhat inappropriate use of this general expression as a class name has also been commented on by Dr. Barbro Julstad. E-mail communication, January 13th 2011.

Personal right class

The name of the class has not caused any considerations during the case-studies. It might however be renamed “Person to property right”, making it easier to compare with the suggested Property to property right name. See table 8.3 and figure 8.1.

Lien class

It has while conducting the case-studies by the author been noticed that the meaning of the term lien was not quite clear to all non-English contributors. The legal term “lien” is in the LCDM used as a term for financial securities, whereas in the Anglo-American legal domain the term is used for a “legal right or interest that a creditor has in another’s property, lasting usually until a debt or duty that it secures is satisfied.”²³⁶ However, the financial securities analysed in the case-studies does not necessarily end when the e.g. debt is paid back. It may therefore be considered to change the class name to a more neutral term. A suggestion is to rename the class name to “Monetary liability”. See table 8.3 and figure 8.1.

Relation name

The author has found that the “restrict” relation between the ownership right and land classes should be changed to “in”, since an ownership right is executed in land. See table 8.3 and figure 8.1.

Other changes

The term “encumbering” is used in the LCDM, but can be difficult to understand for non-English readers. It is therefore suggested to exchange encumbering with limiting throughout the LCDM. See table 8.3 and figure 8.1.

²³⁶ Garner (1891, p. 766).

Table 8.3. Proposed changes in the LCDM terminology.

Class name	Proposed change
Appurtenance	Beneficial right
Encumbrance	Limiting right
Common right	Common
Real property right	Property to property right
Personal right	Person to property right
Lien	Monetary liability
Relation name	Proposed change
“restrict”	“in”
Other changes	Proposed change
“encumbering”	“limiting”

The changes of the class names, etc. have also to be changed in the class descriptions, etc. if referred to.

Apart from the modifications listed above, the definitions etc. of the beneficial right class (i.e. the former appurtenance class) and the limiting right class (i.e. the former encumbrance class) need to be added. The classes are present in the graphic part of model, but have not yet been described in the textual part.²³⁷ A textual description would improve the readability of the LCDM. See the suggested additions in table 8.4 below.

²³⁷ Paasch (2008).

Table 8.4. Modifications of the LCDM beneficial right (former appurtenance) and limiting right (former encumbrance) classes.

Current wording	Suggested wording
Beneficial right class	
<p><i>Object:</i> None</p> <p><i>Characteristics:</i> None</p> <p><i>Definition:</i> None</p>	<p><i>Object:</i> Right furthering the use and enjoyment of a real property.</p> <p><i>Characteristics:</i> Consisting of the beneficial common, property to property right, person to property right, latent right and monetary liability classes.</p> <p><i>Definition:</i> Right beneficial for the use and enjoyment of real property.</p>
Limiting right class	
<p><i>Object:</i> None</p> <p><i>Characteristics:</i> None</p> <p><i>Definition:</i> None</p>	<p><i>Object:</i> Right limiting the use and enjoyment of real property.</p> <p><i>Characteristics:</i> Consisting of the beneficial common, property to property right, person to property right, latent right and monetary liability classes.</p> <p><i>Definition:</i> Right limiting the use and enjoyment of real property.</p>

The updated LCDM terminology is shown in figure 8.1 below. The updated class names, descriptions, characteristics and definitions can be seen in appendix 1.

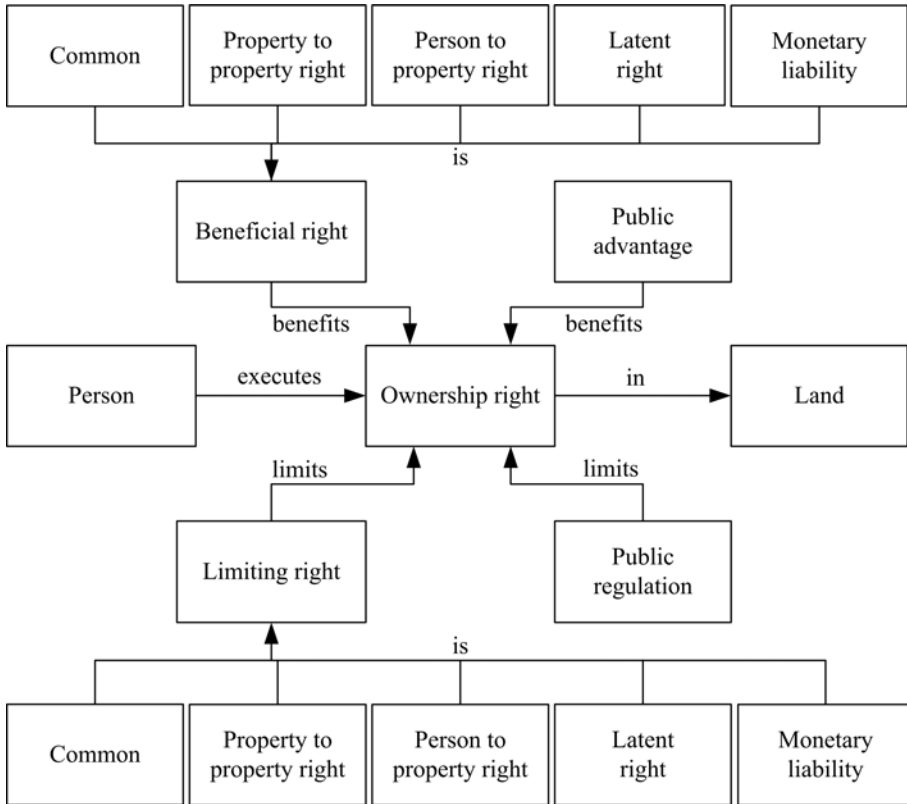


Figure 8.1. Legal Cadastral Domain Model.

8.3 Suggestions for future research

The research presented in this report has aimed at verifying a conceptual model through analysis of rights registered in national registers. However, the case-studies have only covered the major formal legal systems and rights registered in the selected nations registers. The LCDM can be made subject to numerous other research initiatives. Examples are case-studies on other types of rights not being subject for the case-studies in this report, e.g. formal rights not registered in national registers; case-studies on rights from

other legal families, e.g. religious law systems and case-studies on customary rights.

Furthermore, the case-studies presented in this report have dealt with the rights part of the LCDM. There is, however, also a need to analyse and eventually further develop the public regulation parts of the LCDM. A case-study on Swedish public regulations is currently being conducted by the author, but more research on public regulations in different legal systems is needed to test and develop this part of the Legal Cadastral Domain Model further.

9 Swedish summary

Denna rapport är resultatet av författarens inventering och analys av registrerade markreglerande rättigheter i Tyskland, Irland, Nederländerna och Sverige. Rapporten ingår som en del av författarens forskningsprojekt kring klassificering av markreglerande rättigheter och offentligrättsliga regleringar.

Rapporten bygger på två av författaren publicerade artiklar som beskriver en hypotes för att klassificera privata markreglerande rättigheter och offentligrättsliga restriktioner, av författaren kallad Legal Cadastral Domain Model (LCDM).

Syftet med rapporten är att undersöka om den del av LCDM som beskriver markreglerande rättigheter kan bekräftas genom empiriska studier. Rapporten innehåller resultatet från fyra fallstudier av registrerade rättigheter i Tyskland, Irland, Nederländerna och Sverige.

Fallstudierna visar att det är möjligt att klassificera ländernas rättigheter enligt modellen, men undantag av några enstaka rättigheter som inte uppfyllde alla kraven för inplacering i rättighetsgrupperna. Under arbetet har det även framkommit att den använda engelskspråkiga terminologin i vissa fall kan leda till missförstånd eftersom enstaka namn har en lite avvikande mening i den engelska juridiska vokabulären. Dessutom visade det sig att ett enklare språkbruk skulle främja förståelsen av modellen. Modellen är således i behov av mindre kompletteringar. Kompletteringarna finns redovisade i kapitel 8 och appendix 1.

Rapporten beskriver endast markreglerande rättigheter på en övergripande nivå. Författaren anser att det bör bedrivas ytterligare forskning kring utvecklingen av modellen grundad på mera detaljerade studier av markreglerande rättigheters innehåll och struktur. Dessutom behövs en validering av de delar av modellen som beskriver offentligrättsliga regleringar, men inte är föremål för fallstudierna i denna rapport. Författaren genomför för tillfället en fallstudie kring svenska offentligrättsliga regleringar, men ytterligare fallstudier i andra legala system behöver genomföras.

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10.2.5 International

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Appendix 1

This appendix contains the descriptions of the classes in the Legal Cadastral Domain Model (LCDM), incl. the modifications described in chapter 8. Old class names are placed in {}.

The descriptions are listed alphabetically.

Class	Object
<i>Beneficial right</i> {Earlier named Appurtenance }	Right furthering the use and enjoyment of a real property.
Characteristics Consisting of the beneficial common, property to property right, person to property right, latent right and monetary liability classes.	
Definition Right beneficial for the use and enjoyment of real property.	

<p>Class</p> <p><i>Common</i> {earlier named Common right }</p>	<p>Object</p> <p>A relation between two or more real properties and land legally attached to them.</p>
<p>Characteristics</p> <p>Relation between two or more real properties and land legally attached to them.</p> <p>The common is transferred together with a real property when the property is sold or otherwise transferred.</p> <p>Owners of the participating real properties execute co-ownership rights in the land at issue.</p> <p>The common can be limiting and/or beneficial to ownership.</p>	
<p>Definition</p> <p>Real property to land relation executed in land legally attached to two or more real properties. Owners of the participating real properties execute co-ownership rights in the land at issue.</p>	

Class <i>Land</i>	Object Part of Earth.
<p>Characteristics</p> <p>Part of the person – ownership right – land connection</p> <p>Solid entity.</p> <p>A limited part of Earth.</p> <p>Can be regulated through legislation.</p>	
<p>Definition</p> <p>Part of Earth which is regulated through ownership. Land is the surface of the Earth and the materials beneath.</p> <p>Note: Water and the air above land might also be considered land in some legislation.²³⁸</p>	

²³⁸ Based on UNECE (2004, pp. 58).

Class <i>Latent right</i>	Object A connection between a latent right and a real property.
<p>Characteristics</p> <p>A latent right waiting to be executed on or by a real property.</p> <p>Regulating the exploitation of a real property by another real property or person.</p> <p>When a real property is sold or otherwise transferred the right normally follows with it.</p> <p>The right will be classified as a common, property to property right, person to property right, public regulation or public advantage when executed, depending on its specific characteristics.</p> <p>The right can be limiting and/or beneficial to ownership.</p> <p>The right does not contain security for payment or other than financial interests, such as mortgage. These rights are placed in the monetary liability class.</p>	
<p>Definition</p> <p>Right not yet executed on a real property.</p>	

<p>Class</p> <p><i>Limiting right</i> {earlier named Encumbrance}</p>	<p>Object</p> <p>Right limiting the use and enjoyment of real property.</p>
<p>Characteristics</p> <p>Consisting of the limiting common, property to property right, person to property right, latent right and monetary liability classes.</p>	
<p>Definition</p> <p>Right limiting the use and enjoyment of real property.</p>	

<p>Class</p> <p><i>Monetary liability</i> {Earlier named Lien}</p>	<p>Object</p> <p>A connection between a financial right or interest that a creditor has and a real property.</p>
<p>Characteristics</p> <p>A legal right or interest that a creditor (person or real property) has in another's real property.</p> <p>Lasting usually until a debt or duty that it secures is satisfied.</p> <p>A latent, financial security for payment.</p> <p>The real property is used as security for payment and can be subject for forced sale.</p> <p>When executed, the lien will be transferred as property to property right or a person to property right depending on the type of creditor.</p> <p>The right can be limiting and/or beneficial to ownership.</p>	
<p>Definition</p> <p>A latent, financial security for payment.</p>	

Class <i>Ownership right</i>	Object Ownership of real property.
<p>Characteristics</p> <p>A connection between person and a specific piece of land.</p> <p>An executed right to own real property.</p> <p>Can be executed by one or more persons.</p> <p>Subject to legislation.</p>	
<p>Definition</p> <p>Right to own real property according to legislation.</p>	

<p>Class <i>Person</i></p>	<p>Object Owner of real property.</p>
<p>Characteristics</p> <p>An entity, i.e. an individual or an incorporated group having certain legal rights and responsibilities.</p> <p>Can be any physical or legal person (including state, municipalities and other private or governmental authorities).</p> <p>Owens real property according to legislation.</p>	
<p>Definition</p> <p>Human being or legal person, state, municipality and other private or governmental authority who owns real property according to legislation.</p>	

<p>Class</p> <p><i>Person to property right</i> {earlier named Personal l right }</p>	<p>Object</p> <p>A connection between a person (not owner) and a real property.</p>
<p>Characteristics</p> <p>A right executed by a person other than the owner in a real property.</p> <p>The right to use or harvest the fruits/material of a real property, rent or lease the real property in whole or in part.</p> <p>The right can be limiting and/or beneficial to ownership.</p>	
<p>Definition</p> <p>Right executed by a person to use, harvest the fruits /material of, rent or lease the real property in whole or in part, including the claim against a person.</p>	

<p>Class</p> <p><i>Property to property right</i></p> <p>{ earlier named Real property right }</p>	<p>Object</p> <p>A connection between two real properties.</p>
<p>Characteristics</p> <p>Right executed by the owner of a (i.e. dominant) real property in another (i.e. servient) real property.</p> <p>Right executed on the whole real property or a part of the real property.</p> <p>The right is transferred together with the real property when the property is sold or otherwise transferred.</p> <p>The right can be beneficial and/or limiting to ownership.</p>	
<p>Definition</p> <p>Right executed by the owner of a real property in another real property, due to his ownership.</p>	

V

Terminological Aspects Concerning Three-dimensional Real Property

Jesper M. Paasch¹, Jenny Paulsson²

Abstract. *This article discusses terminological aspects concerning definitions of three-dimensional (3D) real property.*

The authors have noticed that researchers from different countries, and even within the same country, use different terminology when describing 3D property. Neither have any general international definition of 3D property been encountered which is possible to use internationally to differentiate forms of 3D property. The aim of this article is to discuss terminological aspects of 3D property, resulting in a working definition of 3D property. The definition is tested and validated against other 3D property definitions encountered internationally.

The basic aspects of terminology in general and legal terminology in particular are studied as a foundation for discussions on forms of 3D property rights and 3D property terminology. Examples of various terms used internationally, in different countries and legal families, are presented, showing the variety and difficulties with standardising the terminology. The problem of existing inconsistent terminology used today is addressed by applying methods from the field of terminology within the 3D real property domain. An overview of 3D property and property rights and what characterizes each of them is also presented. Thereafter the terminological principles are applied on a survey of 3D property rights to create a working definition for 3D property.

Based on the validation, it can be concluded that the studied definitions all have shortcomings from a legal perspective, such as being too narrow or too wide, focusing on use rather than on object, or describing the physical object instead of the legally defined 3D object. This shows that it is difficult finding an accurate and internationally valid definition of 3D property. The authors believe that using unified terms and definitions will act towards a common understanding and thus further the establishment of a domain specific ontology within the field of 3D property.

Keywords: *Three dimensional real property, definition, terminology, ontology, standardization.*

¹ KTH Royal Institute of Technology, Division of Real Estate Planning and Land Law, 10044 Stockholm, Sweden, and Lantmäteriet [the Swedish mapping, cadastral and land registration authority], 80182 Gävle, Sweden. Email: jesper.paasch@lm.se

² KTH Royal Institute of Technology, Division of Real Estate Planning and Land Law, 10044 Stockholm, Sweden. Email: jenny.paulsson@abe.kth.se

1 Introduction

1.1 Background

In recent years there have been a number of publications regarding the harmonisation, unification and methodology of law in general, in which attention has been given to terminological aspects, among others (e.g. van Hoecke, 2004). However, there have only been rather few scientific contributions dealing with the use of terminological principles in the real property domain³, including three-dimensional real property and three-dimensional real property rights (hereafter shortened 3D property and 3D property rights) (e.g. Paulsson and Paasch, 2011).

3D property is often considered to be a special type of property, different from the traditional 2D property. The normal case is that all space within the 2D parcel belongs to and can be used by its owner, but the possibility to grant specific rights to a part of this space within the 2D property exists and can take different forms. There is competition for space, especially in the cities, with increasing population and more advanced space-demanding activities that will have to share space within the same 2D property unit. Complex situations where there is a need to separate the ownership within an existing parcel and its space can be found (Stoter and Ploeger, 2002, p. 1.2). Different types of 3D property rights have existed for a long period of time (Bugden et al., 1997, [1-000]), but the need for them, as well as use, has increased in recent years (Sandberg, 2003, p. 125).

Therefore 3D property rights have become an important part of the cadastral domain and are fundamental for effective land use and land management. The concept of 3D property has been in focus for some time with the discussion regarding how to secure such rights. For example, the International Federation of Surveyors (FIG) arranged an international workshop on 3D cadastres in 2001, a decade ago. General questions regarding registration of properties in strata (i.e. in layers) were discussed. One of the outcomes of the working session on legal issues concerned the question of what is “3D property” and whether or not it is possible to construct a definition of this concept. The conclusion was that it depends to a large extent on the legal system and cultural background (FIG, 2002). Since then, the problems of finding definitions have been addressed by e.g. Paulsson (2007) and Sherry (2009) during the last decade.

The cadastral domain has nonetheless been subject to a standardized approach for a number of years conducted by both the scientific community and professional organisations. For example, in recent years attempts have been presented to increase uniformity in the cadastral domain through e.g. the presentation of the FIG Cadastre 2014 statement describing a vision for a future cadastral system (Kaufman and Steudler, 1998) and the current development of an international standard for land administration, the Land Administration Domain Model, LADM (ISO, 2011).⁴

³ Domain is in this article defined as a specialised field of activity.

⁴ The LADM is currently in the process of becoming an international standard for land administration. Note: The LADM has originally been published as the Core Cadastral Domain Model by Oosterom et al. (2006) before being renamed as Land Administration Domain Model (LADM).

1.2 Problem description

There is no agreed international definition of 3D property. Most definitions seem to be based on national legislation and its specific, national characteristics of 3D property.⁵

The authors have noticed that researchers from different countries, and even within the same country, use different terminology when describing 3D property, especially when they are writing in non-native languages, such as English. Paulsson (2007) discusses the problem of finding a proper definition of 3D property and the discrepancy in terminology. She concludes that there does not seem to be a simple meaning to this concept. Sherry (2009, pp. 131–132) discusses the differences in terminology in the common law countries and the inconsistency that exists there both nationally and globally. Since the different states of, for example, the United States and Australia have their own legislation for 3D property rights, there can also be a varied terminology within countries. These differences can be considered as a challenge when discussing these issues internationally. Neither are the legal structures behind the terminology shown in this varied terminology. Even if the legal systems are consistent, the terminology might not be as consistent and that makes it more difficult to discuss these systems (Sherry, 2009, p. 132).

1.3 Scope and delimitation

The aim of this article is to discuss terminological aspects of 3D property, resulting in a working definition of 3D property. The definition is tested and validated against other 3D property definitions encountered internationally.

The scope includes a discussion of the problems regarding producing a definition for 3D property as identified by the authors and points to the differences in the terminology and definitions of 3D property that are actually used, encountered during the authors' earlier research.

The article does not present a solution of how to develop and maintain a terminology, but outlines and discusses how to deal with the problems. The 3D property definition presented in this article is not to be regarded as a final definition, but as an input for further research regarding the nature and structures of 3D property. The article is a contribution to the establishment of a domain specific ontology for the 3D property domain. Applying principles from the field of terminology will in the authors' view help to structure this part of the legal domain in regard to cross border transfer of information.

Furthermore, the article does not address any standardization of legislation and the development of optimal sets of legal rules for 3D real property.

1.4 Methodology

In the first part of the article the basic aspects of terminology in general and legal terminology in particular are studied as a foundation for discussions on forms of 3D property rights and 3D property terminology. Thereafter the terminological principles are used in a survey of forms of 3D property rights to create a working

⁵ The same is, of course, the situation for the traditional 2D property as well.

definition for 3D property. The aim is to produce a definition covering the legal aspects of 3D property, since these aspects by the authors are seen as a foundation for 3D property. Without proper legislation, 3D properties cannot be formed at all. The working definition is then validated against a selection of existing 3D property definitions found internationally. The selection is based on research conducted by Paulsson (2007) and supplemented with definitions published during 2007–2011 (FIG, 2010; ISO, 2011). Since there is no generally accepted definition of 3D property, it is neither possible to test the authors' proposed definition, nor the other selected definitions against such a general definition. The purpose of the validation is to investigate whether the working definition agrees with the already existing definitions or descriptions of 3D property, and whether they can be replaced by the proposed working definition, thus creating an internationally applicable definition for 3D property.

2 Terminology

2.1 Basic terminological components

In order to apply a terminological approach the basic components used in terminology must first be studied: *object*, *concept*, *characteristic*, *definition* and *term*. These components are closely related and one is either the result or basis of one of the others. An *object* is anything that is perceivable or conceivable. Some objects are material (e.g. a piece of land), immaterial (e.g. an urban planning zone) or imagined (e.g. a unicorn). A *concept* is a mental construction of the real world formed in our own mind. A concept does not stand alone, but is part of a concept system, where concepts are put in relation to each other according to specific rules. It is the *characteristics* which make us identify the 'real world' when we create our vision of it in our mind as a concept. However, it is not possible to use objects, concepts or characteristics to communicate effectively. A *definition* must describe what is meant with the concept.

A definition must be as precise as possible to avoid misunderstandings and confusions. Ambiguity of words makes it difficult to express precisely what is meant. A general, methodological problem is the use of words. A major task for any undertaking is to apply the correct terminology and ensure the correct understanding of the texts and diagrams describing the topic subject for the description. However, it would be rather complicated to always use definitions when communicating. *Terms* to express them are therefore needed. Terms are the instruments used for communication. A term must have a specific meaning, based on the definition delimiting and describing a concept. Otherwise it would mean different things to different people. However, applying terms is not simply a matter of using one word or another for describing something. Any term must be based on the discussion of our mental pictures of real world objects, delimited by a number of characteristics which are mandatory for the object in question (ISO, 1996; ISO, 2000a; ISO, 2000b and Suonuuti, 2001).

In order to achieve a thorough understanding of a fact, a problem or a semantic network of events, there must be an understanding of not only what

the case is and what it consists of, but also how and why it is the case. It is even limited by our own thoughts, as the symbolism employed when speaking is partly caused by the reference that is made and partly by social and psychological factors (Ogden and Richards, 1923).

The same words can be part of several domains and subject to specific use in specific levels of specialisation. The example below briefly illustrates the use of the term “person” in relation to two, seemingly different, domains; the cadastral domain and the healthcare domain. The examples are hypothetical and do not represent any existing descriptions of the use of the term “person” in the domains.

A term must be specialised for each domain, but nonetheless be based on the same common ground, i.e. the “person” in both domains must be based on the same, basic definition before being used within the specific domains. The term “person” is understood by both domains on a basic level, but might not be used in the same way throughout each domain. A specialisation is added on each level in the hierarchy. The common definition of a “person” may in the cadastral domain be anyone who comes into contact with the domain e.g. real property owner, granted right owner⁶, estate agent, etc. and a patient, legal company, visitor, etc. in the health care domain. In short; it is a human being or a legal person (e.g. a company) who has any contact with one of the domains. A former specialisation of “person” could in the cadastral domain be a person owning a real property and in the health care domain a person requiring treatment for an illness. A further specialisation could be a person owning 3D property or being a patient in the respective domains.

The principle is illustrated in figure 1 below where the same, basic definition of a “person” is used in both domains on a general level, here called domain level 1. Specialised domain-specific descriptions for persons in the cadastral- and healthcare domains are here called domain level 2 and 3. Domain level 3 incorporates the description in domain level 2, whereas the description in domain level 3 is not part of the description in domain level 2.

The three domain levels used in the example above are only illustrative. The level of specialisation can consist of 1 to n domain levels, depending on how general or detailed the domain level is.

2.2 Legal terminology

Terminology is regarded as an important instrument within the legal domain. For example, Ekelöf stated more than six decades ago that ‘it is even of rather huge practical importance that certain and clear-cut terms are commonly accepted as representatives for different elements in the process of legal deduction’ (Ekelöf, 1945, p. 221).⁷ An agreed terminology would, in other words, contribute to the ‘matching’ of 3D property legal systems with their corresponding counterparts existing in other national legal systems. It would e.g. be possible to compare a 3D property, ownership or a 3D property right in country ‘A’ with the corresponding

⁶ Granted rights are e.g. easements and leasehold.

⁷ Authors’ translation from Swedish.

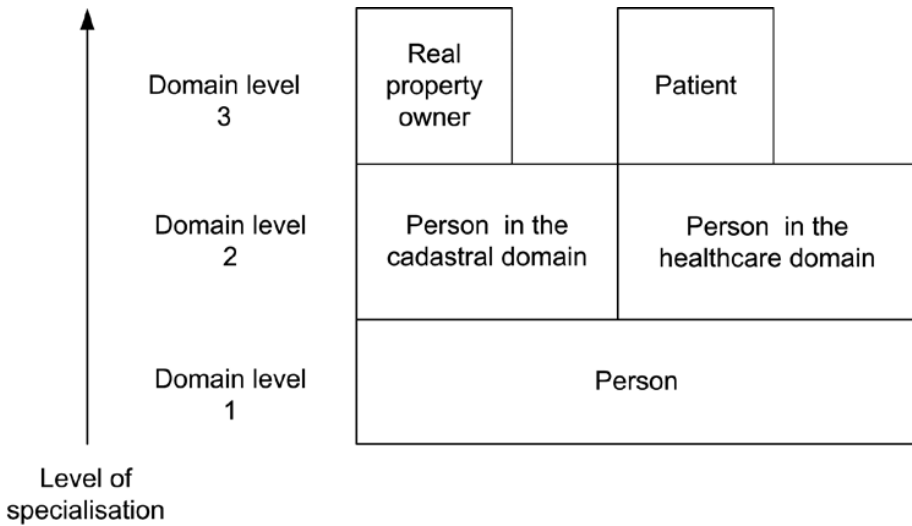


Figure 1. Examples of different levels of terms interacting with each other on different levels of specialisation.

counterpart in country ‘B’, since both rights share the same characteristics since they mean the same thing, even if they are not called the same in the national legislations.

The interpretation, explanation of similarities and differences within the legal domains and exchange of legal concepts and ideas have occupied legal scholars for centuries. A proper understanding of different legal concepts is of utmost importance for e.g. trade between countries. Knowledge about which rules and regulations that apply is needed. Such common understanding of these “legal standards” is equally important as the use of technical standards and standardized measurements, etc.

The first step in being able to apply a standardized approach towards the legal domain is to have means to be able to study it and compare its different parts. It is sometimes even spoken of “the legal system” – as if there existed one single, unitary system of meanings which at least all lawyers share. The common nominator for all legal families is that they are expressed in natural languages. With natural languages there is always the risk of misunderstanding, since natural languages are not predefined and clear systems of communication. Words might mean one thing on one legal domain level and another thing on another legal domain level. Therefore, any comparison of legal systems must include a study of to what extent the words used in the legal systems which are subject for comparison bear the same meaning (van Hoecke, 2004, p. 175).

There is no “natural” or universal form of law. All forms of law reflect the aspects of the culture and values of the society to which they belong. Neither is there any universal language to express law. Within any community where a particular natural language is spoken, narrower groups may differ from each other

in the particular ways in which they use language. These professional languages may even differ within themselves, e.g. a legal area might use (slightly) different expressions and vocabulary than another area within the same professional domain (Jackson, 1995). The legal domain is therefore not a homogenous body, but a patchwork of different legal domains based on different national legislation and cultural heritage.

It is necessary to understand the terminology in each specific language used for the compared systems. It makes it more difficult for legal comparatists to use a third language with a terminology not familiar to any of them (Bogdan, 1993, pp. 42–43). Bogdan considers it to be one of the greatest risks, when making comparative studies of other legal systems, to take it for granted that the legal concepts in one's own legal system can be used in the same way in the studied foreign system. Many foreign legal terms and concepts do not even have any equivalent in one's own language (Bogdan, 1993, p. 52). A legal term can also bear a different meaning when used outside legal terminology but within the same language. Bogdan questions whether it is at all possible to find just one word to translate certain legal terms. He suggests that special legal dictionaries or dictionaries where the words are explained in the same language might be helpful to understand the content of the term (Bogdan, 1993, p. 54). Without any agreement, it is impossible to achieve any effective communication or comparison (Ogden and Richards, 1923).

There have been several contributions towards the ontology and terminology of the cadastral domain during the recent years, see e.g. Paasch (2005, 2007, 2008), Ruonavaara (2003) and Stuckenschmidt, Stubkjær and Schlieder (2003). Ruonavaara discusses the terminology problem and points out that comparing forms of housing tenures between countries is a difficult task due to the 'bewildering variety of kinds of housing tenure' (Ruonavaara, 1993, abstract) and the fact that the tenure forms that are formally the same will in fact vary in content in the different countries where they exist. It is not only a problem of comparison, but also of translating the national form of tenure into one term that is understood in another country with other terminology and other forms of tenure. Ruonavaara suggests that tenures are just formal categories where the content is determined by the nationally and historically specific social relations of housing. As a solution to the problem of translating and comparing he proposes moderate constructivists' way of looking at tenure on two levels, one being general ideal types that are defined by some necessary features and the other being specific historically and geographically actual forms. He suggests that even though the types of tenure are changing historically and geographically, the variation of the rights and duties connected to these forms is bound by certain limits. Since the various types share certain characteristics within the specific categories, which cannot be extended to other forms without losing their distinctive nature, Ruonavaara argues that it is really possible to make an international comparison of national forms of tenure on a general level and to translate the categories specific for a country or legal system into terms that can be used and understood internationally. More detailed investigations can then be carried out by grouping the forms into some specific

types and then comparing them by using a specific scheme with certain dimensions (Ruonavaara, 1993, p. 18).

3 3D property

3.1 3D property terminology

There is no agreed terminology for the general 3D property concept. It seems that “3D cadastre” sometimes is used just to describe the actual cadastre, or property registration system, that cadastre stands for, but also as a general term for three-dimensional property. Another common term is “3D property”, which is used mainly in this article. The authors have encountered many other terms for this concept as well. Not all of them include “3D” or “three-dimensional” as a component. Some of them refer to “multi-functional” or “multiple”, which puts the use of the land parcel in focus and the different activities and/or actors involved. Others involve “space” or “volume”, referring to the extension of the parcel, not just related to land. Another focus is the delimitation of the parcel, such as “horizontal subdivision”. The subdivision and form of ownership is also an important aspect in the common law legislation, stemming from the Australian legislation, which uses the terms “stratum” and “strata title”. The Swedish “*tredimensionell fastighet*” translates into “three-dimensional property unit” (Mattsson and Österberg, 2007, p. 348).

If referring more specifically to apartment/flat ownership or condominium, which is also a form of 3D property, again a number of different terms can be encountered. These are often related to the building and the subdivision of it into apartments. In some cases there is a clear difference between the forms independent 3D property and condominium, both in the legislation and in the terminology, in other cases only one of these form exists, or a mixture, or, as in the Swedish case, where the condominium is just a special type of 3D property unit intended to contain nothing but one single residential apartment (SFS, 1970:994, chap. 3, s. 1a).

Mentioning a few of the terms to be found internationally, there are terms such as “apartment ownership” or “flat ownership”, “ownership of storeys” or “horizontal property”, “condominium”, “condominium ownership” or “condominium property”, “strata title” “horizontal property”, “ownership of flats”, “multi-storey building”, “compartmented ownership of buildings”, “sectional ownership”, “unit ownership” or “unit title”, “ownership of space”, or older terms such as “division of houses according to storeys and apartments”, “co-ownership of houses according to storeys”, “houses in common ownership”, “community of houses divided by storeys” and “a house with various owners” (van der Merwe, 1994; Christudason, 1996). The list could be expanded further with other examples.

3.2 Types of 3D property rights

When discussing the problems connected with defining 3D property rights and the terminology used for it, the different types of 3D property rights that exist around

the world must be studied, since these forms and their nature are closely related to the terminology that is being used.

Internationally it is possible to find different types of 3D property rights, i.e. rights associated with 3D property. A property right is in this article defined as an “action, activity or class of actions that a system participant may perform on or using an associated resource” (ISO, 2011, p. 5). These rights usually have different names and functions. They gradually range from ownership to granted rights (such as e.g. leases). Even though there are no clear boundaries between 3D property rights, it is still possible to make a categorisation into some forms of such rights. The main types, as categorised by Paulsson (2007), are the independent 3D property, the condominium form, indirect ownership and granted rights. The independent 3D property is the subdivided part of the volume that the 2D property contains which is individually owned and often consists of a larger part for infrastructure purposes, for the residential or the office part of a building, etc. The condominium is apartment ownership, where smaller parts of a building, such as a residential apartment for one family or a office, are owned through direct ownership of that specific part or through a user right to that apartment provided by owning the building in common with the other residents. The term indirect ownership (Paulsson, 2007) refers to ownership through a legal person, such as an association, which is the formal owner and stands between the resident and the property. Examples of this type are tenant-ownership and the limited company system. Granted rights include forms such as leasehold or servitude, with no real ownership.

A suggested categorisation of these rights can be found in table 1 below. A difficulty with this categorisation is that there is no clear division between the rights. Many of them include similar elements and there are also differences related to the legislation in the various countries where these types exist.

The (1) independent 3D property is the type of property which usually contains larger units and that is relatively unattached to surrounding properties, compared with the other types. It may contain just a volume of air, as for the (1a) air-space parcel, or be connected to and included in a building or some form of construction, which Paulsson (2007) calls a (1b) 3D construction property. The (2) condominium usually stands for some form of apartment ownership, connected to a building. In most cases it consists of the apartment, a share in common property within and surrounding the building and membership in an owners' association that will manage the common areas. There are two main condominium types, the (2a) condominium ownership and the (2b) condominium user right. Condominium ownership signifies that the occupant of an apartment individually owns the specific part of the building which consists of the apartment in which that person lives. All occupants own the remaining parts of the building, the common parts, jointly by shares. Regarding the condominium user right, on the other hand, the occupants jointly own the apartment building, and the shares by which they own it give them an exclusive user right to a specific individual apartment.

A common feature for the group of 3D property rights called (3) indirect ownership is that there is an association, a company or other form of legal

Table 1. *Types of 3D Property Rights Generally (Paulsson, 2007, p. 32).*

(1) Independent 3D property	(a) Air-space parcel
	(b) 3D Construction property
(2) Condominium	(a) Condominium ownership
	(b) Condominium user right
	(c) Condominium leasehold
(3) Indirect ownership	(a) Tenant-ownership
	(b) Limited company
	(c) Housing cooperative
(4) Granted rights	(a) Leasehold
	(b) Servitude
	(c) Other rights

person that stands between the occupant and the apartment. The occupants have membership or shares in the association or company, which gives them the right to use a specific apartment in the building. The (3a) tenant-ownership type is common in Sweden, a form where an association owns the apartment building, and members of the association by providing capital to this association obtain the right to use their respective apartments in the building. Finland has a similar type, the (3b) limited company system, where a joint stock company owns the building and by acquiring shares in that company, it is possible to obtain the right to exclusively use one of the apartments in the company-owned building.

(4) Granted rights, such as (4a) leasehold and (4b) servitudes can also be types of 3D property rights, but cannot be included in 3D property or 3D property units. Even the rented apartment can be considered as a form of 3D property right, since it is the right to occupy a three-dimensionally delimited volume, but it is usually not included when discussing 3D property rights.

4 Definitions of 3D property

4.1 Working definition of 3D property

Focusing on the three-dimensional aspect of the 3D property, a three-dimensional object can be defined as something that has an extent in length (height), width and depth. This does not mean, however, in comparison that a 2D property is flat and only includes the surface of a parcel. It is also in many jurisdictions considered to be three-dimensional in its extension and in theory extending infinitely upwards into the sky and downwards to the centre of the earth (see e.g. Powell and Rohan, 1993, Vol. 2A, 263.3[1a]). Thus, the three-dimensional aspect of 3D property is not so much the extension of the property, but rather the delimitation of it. The 2D

property is normally delimited in just one plane, while the 3D property is delimited in both the horizontal and in the vertical plane. The term ‘three-dimensionally determined property’ is related to this aspect of the 3D property concept.

Traditionally, 2D property is registered by x and y coordinates and the 3D property by x, y and z coordinates. A definition of 3D property focusing on the delimitation aspect could therefore be ‘property delimited both horizontally and vertically’, i.e. in length, width, and also height and/or depth. A proposed definition of 3D property focusing mainly on the extension would be of greater use internationally than one dependant on the specific legislation. One disadvantage with such a definition is that it does not explain or define what 3D property is.

However, the purpose of a definition of 3D property is mainly to focus on the 3D aspect and what separates it from the regular 2D property. The property concept itself is related to the legislation, which, as mentioned, varies between countries. The authors want to focus on the legal aspect of the 3D property instead of e.g. referring to it as a volume that is delimited. To focus on the legal side of 3D property and not only the volume, 3D property can be defined as *‘real property that is legally delimited both vertically and horizontally’*. Such a definition would distinguish the 3D property from the 2D property, and still be able to include different types of 3D property in different legal systems.

4.2 Validation of working definition of 3D property

When looking at the legislation of different countries and scientific literature, a number of different definitions and descriptions of the term 3D property and what it consists of can be noticed. Some of these definitions will be presented and discussed below as examples of various types.

In order to validate the working 3D property definition, it is suitable to start by briefly discussing real property in general. It is not an easy task to define what real property is, see e.g. Mattsson (2003, p. 24). Real property is not a standardised and homogenous term and the definitions presented vary between the authors. Real property is usually defined as something distinct from personal property. This distinction is still important, even though the law for these property types has been assimilated to a great extent (Chappelle, 1992, pp. 4–5). The “real” part of the “real property” term is usually associated with something solid, fixed and permanent and is related to land (Mattsson, 2003, pp. 24–25). However, realty and land is not the same thing, since there are interests in land that are not real property (Chappelle, 1992, p. 4). Often the Latin term *in rem* is used in reference to real property. Rights *in rem* refer to real property rights as opposed to personal contractual rights. Such rights can consist of both rights in land and other assets (Arruñada, 2001, p. 5). Larsson (1997, pp. 8–9) claims that real property, or real estate, are terms that refer to land in the broad sense consisting of a physical area and fixtures, but also the rules, institutions and socio-economic characteristics that it is connected with. Real property is also not just defined through its physical characteristics, but also by the legislation, stating what powers in the land that the owner does not have (Mattsson, 2003, pp. 25–26). However, e.g. in the Swedish legislation no real definition of real property can be found. According to the Land

Code, real property is land, and land is divided into property units (SFS, 1970:994, Chap. 1, s. 1).

The FIG working group on 3D cadastres⁸ points out that to determine what a 3D parcel is in its broadest sense depends on the legal and organisational context in the specific country or legal system. The objective of the working group is to establish a common understanding of the terms and issues involved in 3D cadastre, building on the content of the coming ISO standard.⁹ The organisation describes the 3D parcel as spaces of legal objects, including land and water spaces, both above and below surface. Their suggestion for a definition of a 3D parcel is “the spatial unit against which (one or more) unique and homogeneous rights (e.g. ownership right or land use right), responsibilities or restrictions are associated to the whole entity, as included in a Land Administration system. FIG describes the definition as “quite abstract” (FIG, 2010, p. 1). This definition seems rather complicated and focuses more on rights than ownership, as well as the cadastral registration aspect of the 3D property. It should be possible to include more than one type of right, e.g. different ownership to the same unit. It does not say anything about the limitation of the parcel and since there is no mentioning of the three-dimensional delimitation of it, it could just as well include also the regular 2D property.

Stoter et al. have studied, above all, the technical aspects of 3D cadastre. They present a definition of a 3D property unit as “a (bounded) amount of space to which a person is entitled by means of real rights” (Stoter et al., 2004, p. 2). This is a wide definition, which could include also a regular 2D property. The specifics of 3D property rights are not mentioned here, more than that it is somehow bounded. A specific term used is ‘stratified property’, which they explain by several users using an amount of space limited in three dimensions and positioned on top of each other within one surface parcel or crossing parcel boundaries, and where real rights are established to entitle persons to the separate volumes (Stoter et al., 2004, p. 2). This is a more accurate description of 3D property, although rather long and complicated. It is also too narrow, since it is possible to find forms of 3D property not fitting into this description.

Julstad (1994, pp. 17–18) discusses enjoyment of three-dimensional property in Sweden, in her study made before 3D property was introduced into Swedish legislation, and is using this term inclusively, both for independent ownership of three-dimensional space in land or buildings and other structures in the form of real or personal property, and for the right that comes with owning a property to use land or buildings on another property unit. She describes more the process of 3D property formation, as all methods available for the creation of three-dimensional property enjoyment through property formation, which thus involves changing the property rather than the 3D property unit that is obtained by making this change. It is not possible to use this as a definition since it does not really say what 3D property is, but is more focused on ownership and the property formation

⁸ See the FIG 3D working group website: <http://www.gdmc.nl/3DCadastres>

⁹ See the FIG 3D working group website for more information: <http://www.gdmc.nl/3DCadastres/index.html>

process. Taking Swedish legislation as an example, a definition of 3D property can be found in the Swedish Real Property Formation Act (and Land Code), based on the characteristics of this Swedish form (SFS, 1970:988, Chap. 1, s. 1a; SFS, 1970:994, Chap. 1, s. 1a). The definition in these Acts states that a 3D property unit is a property unit which in its entirety is delimited both horizontally and vertically. Since forms of 3D property exist in other countries that are not included in such a definition and not delimited as a whole, this definition would be too narrow for constituting an internationally valid definition. The Swedish governmental bill for the 3D property legislation describes 3D property enjoyment as the exclusive use of different horizontal planes or floors of a property unit for mainly separate purposes (Proposition 2002/03:116, p. 26). Such a description can include also other types of rights, not just ownership, and does not mention any physical delimitation into property units.

Another term connected to 3D property is “airspace”, used for example in American legislation. Powell and Rohan (1993, Vol. 2A, 263.1[1]) present this as a term for independent units of real property that are created when real property is horizontally subdivided, with the definition “the space above a specified plane over, on or beneath a designated tract of land” This definition focuses more on space than on what 3D property is, and it is not clear whether subsurface space is included. A part of a 2D property unit can also be comprised by this definition, because it does not include any delimitation. Like the authors suggest, the airspace must be described in three dimensions with reference to a specific locus in order for airspace to mean 3D property (Powell and Rohan, 1993, Vol. 2A, 263.1[1]).

The Land Administration Domain Model (LADM) uses a concept of “face” to present a 3D boundary. An example provided in the LADM is that “[b]oundary faces are used where unbounded volumes are not applicable. Boundary faces close volumes in height (e.g. every apartment floor), or in depth (e.g. an underground parking garage), or in all other directions to form a bounded volume. The volumes represent legal space (in contrast with physical space)” (ISO, 2011, p. 3).¹⁰ The LADM does not provide a legal 3D property definition, but describes 3D property as 3D representations of objects (spatial units). The LADM is based on the existence of so-called basic administrative units. A basic administrative unit is an “administrative entity consisting of zero or more spatial units against which (one or more) unique and homogeneous rights (e.g. ownership right or land use right), responsibilities or restrictions are associated to the whole entity, as included in a Land Administration system”. A spatial unit is defined as a “single area (or multiple areas) of land or water, or a single volume (or multiple volumes) of space”. The LADM description is not a definition. The description fits the proposed 3D property definition presented in this article by focusing on the legal aspects and not the physical object as such. However, the delimitation is based on the rather technical concept of “faces”, which can be difficult to understand without the proper technical background.

¹⁰ Some of the words, e.g. spatial unit, are highlighted in the LADM, but not in this article.

5 Conclusions

We all have an understanding of the world around us, but are, however, limited by our own interpretation of the things we want to describe. Using a standardized terminology is a step towards a common understanding of what we want to exchange information about. This is especially important when exchanging information with receivers who might not have the same background, being trained in the local terminology and concepts applied to describe the domain. This also applies to the legal domain in general and to the real property domain in particular, being the result of centuries of natural legal and cultural development. This article deals with the terminological aspects of defining 3D property. It presents an overview of 3D property and property rights and what characterizes each of them. Examples of various terms used internationally, in different countries and legal families, are presented, showing the variety and difficulties with standardising the terminology. The problems with creating a uniform definition of 3D property are also discussed, by providing examples of such definitions from different countries and evaluating their inadequacies.

Internationally different terminology for 3D property can be found, of which this article shows various examples. The terminology depends to a great extent on the national terminology used in the legislation, which makes it difficult to standardise it and determine one specific term for each type of 3D property to be used internationally.

In this article 3D property is defined as '*real property that is legally delimited both vertically and horizontally*'. Such a definition would distinguish the 3D property from the 2D property, and still be able to include different types of 3D property in different legal systems.

The proposed working definition was validated against selected existing definitions and descriptions of 3D property. The definitions all have shortcomings from a legal perspective, such as being too narrow or too wide, focusing on use rather than on object, or describing the physical object instead of the legally defined 3D object. This shows that it is difficult finding an accurate and internationally valid definition of 3D property. Another reason for the difficulties in finding an internationally suitable definition is the different meaning of 3D property as a legal object due to the different legal contents in the national (or state) legislations. A result of the validation is that several existing definitions can be incorporated in the working definition.

The authors are of the opinion that standardized vocabularies or descriptions based on an agreed terminology are tools furthering cross-border real property information. Using unified terms will act towards a common understanding and thus further the establishment of a domain specific ontology within the field of 3D property.

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Modelling Public Regulations - A Theoretical Approach

Abstract

In this article the author explores the concepts of public regulations in regard to real property ownership and land use. The results are used to develop a theoretical, conceptual model for public regulations influencing the landowners' use of the real property. The proposed classification aim at being independent of the legal systems they are created in and intended to be used for classification of public regulations internationally. The purpose is to establish a terminological framework for international exchange of public regulation information. The development of the public regulation model is in this article exemplified and tested with Swedish public regulations influencing the owner's right to use his/her real property.

Keywords

Public regulation, restrictions, real property ownership, modelling, land management, land administration, urban planning, rural planning, land use, Legal Cadastral Domain Model

1 Introduction

This article is a contribution to the research on modelling the cadastral domain. The purpose is to develop a theoretical model for classification of public regulations affecting ownership right of real property.

Public regulation is a rather wide term and can mean different things depending on the context in which it is used. However, regulations can be generalised being as the act or process of controlling by rule or restriction, and a rule or order having legal force usually issued by an administrative agency (Garner, 1891, p. 1064). The descriptions indicate that everything which is dictated by a public agency can be described as a public regulation. The public regulations analysed in this article are influencing the real property

owners' right to use land, water and air. The term "land" is hereafter used as a synonym for land, water and air.

1.1 Problem formulation

There are no agreed international descriptions focussing on a classification of public regulations for an exchange of information, regardless of the legal system they are created in, even if the subject has been discussed in recent years, e.g. the Legal Cadastral Domain Model and the Land Administration Domain Model, LADM. The Legal Cadastral Domain Model is an attempt to create a terminological framework for exchange of real property rights and public regulations. The model does, however, not provide any detailed description on public regulations, but only describes them as being either limiting or beneficial to real property ownership (Paasch 2005 and 2008). The Land Administration Domain Model, LADM is an initiative to develop an international standard for land administration (ISO, 2011). The model does not describe the concept of public regulations in detail, but focus on "rights", "restrictions" and "responsibilities" as general relations between a human or legal person¹ and land. Other attempts to describe public regulations has been done by Hesperha et al. (2009) and Zevenbergen (2004). These descriptions also does however also not describe public regulations in detail. A more detailed approach is therefore needed.

1.2 Scope and delimitation

The scope of this article is to develop a theoretical classification of publicly imposed regulations which regulate the real property owner's *right to use* his² real property. The proposed model is an input to the development of the above mentioned Legal Cadastral Domain Model and the Land Administration Domain Model.

Other factors of public regulations such as how they e.g. regulate property taxes or other fiscal issues have been omitted in this article. The development of a theoretical model is exemplified with Swedish public regulations.

¹ A person is here defined as a human or legal person, state, municipality or other private or governmental authority who owns real property according to legislation (Paasch, 2008, p. 123).

² "His"/"he" is hereafter used as a synonym for any human or legal person (state, municipality or other private or governmental authority) who owns real property according to legislation.

1.3 Hypothesis

The hypothesis that it is possible to create a theoretical model for classifying public regulations based on how the regulations influence the real property owner's right to use his property.

1.4 Methodology and disposition

This article is based on a theoretical legal-economic analysis of how public regulations influence the owner's right to use and otherwise exploit his real property. A description of the concepts of public regulations in relation to land use is given in section 2, followed by a description of the concept of real property ownership in section 3. The ownership concept is then in section 4 used as a theoretical basis for analysis of the functions of public regulations. The findings are used to develop a theoretical model of public regulations in section 5. Conclusions and suggestions for future research are found in section 6.

2 Some economic aspects of public regulations

The function of public regulations in land management is to exercise control of land and act where private contracts between the real property owners and others involved in activities affecting the real property may be of limited use. Public regulations are thus means used by the public administration to regulate social costs and further public interest (Coase, 1960). The main reason for creating public regulations is their ability to regulate negative and positive *externalities* and avoid or reduce *transaction costs*.

Externality is a term used in economics and can be described as "an unintended and uncompensated side effect of one person's or firm's activities on another" (Sterner, 2003, p. 23).³ The use of public regulations is a way to licence the use of land, mandating prior approval for a number of specified land uses (Ogus, 1994).

A *negative externality* is in principle the result of the (private) markets not regulating land use problems on its own. The unrestricted interaction of market forces does not, according to Ogus (1994, pp. 29-54), function in the real world and private law cannot always provide an effective solution, which result in the creation of e.g. external costs not covered by those creating them. This situation is by economists called a "market failure" (Sterner,

³ See also Kalbro and Lindgren (2010, pp. 19-65), Ekbäck (2000, pp. 29-45), Ogus (1994), Pearce and Turner (1990), Achain and Demsetz (1973), Demsetz (1964, 1967) and Coase (1960).

2003; Ogus, 1994). Examples are resources produced, stored or used on one real property may cause damage to goods or people on a neighbouring property, e.g. by the spreading of pesticides. It might for an individual company not be cost effective to refine, deposit or otherwise take care of its industrial waste. This creates a negative effect, i.e. a loss of welfare for the neighbouring landowner(s) (Pearce and Turner, 1990).

A *positive externality* is a commodity where the benefits are “shared by the public as a whole or by some group within” (Ogus, 1994, p. 33). They range from e.g. national security and the construction of public roads, to the establishment of nature reserves and providing access to e.g. lakes and seashores for the public. These facilities may not be of interest for the individual entrepreneur since there may not be a profit involved. DiPasquale and Wheaton argue that it often is necessary to use institutional mechanisms for owners to act in groups “in order to determine what public goods ought to be provided and how they should be financed” (DiPasquale and Wheaton, 1996, p. 348).

Transaction costs are costs arising when negotiating the transfer of one commodity, e.g. a real property, from one owner to another (Alchain and Demsetz, 1973; Demsetz, 1967; Coase, 1960). Transaction costs may have a huge influence on effective land management. Direct negotiations concerning e.g. compensation for pollution are only efficient when rather few participants are involved. Any large number of participants negotiating a solution would generate a time consuming and costly process to achieve an agreement and is therefore not a realistic instrument to use (Kalbro and Lindgren, 2010, pp. 19-65; Ekbäck, 2000, pp. 29-45; Ogus, 1994). However, even if an agreement may be reached, the costs of policing and controlling that the agreement is honoured by the involved parties may be high (Demsetz, 1967). This concept of voluntary agreements would therefore not function in a market situation and it may be more efficient with public instructions regulating which activities are allowed to be executed on a real property (Kalbro and Lindgren, 2010, p. 20).

3 Real property ownership

The concept of real property has been discussed and described by numerous authors, e.g. Meinen-Dick and Mwangi (2008), Freyfogle (2007), Mattsson (2004), Hensen (1995), Honoré (1987), Alchain and Demsetz (1973), Snare (1972), Bergström (1956) and Hohfeld (1913; 1917). Slightly different views exist, but the generally accepted view is that ownership to real property does not imply that we actually own the resources ourselves, but the (major) right to use and otherwise exploit them. What is owned is therefore not the object

itself, but socially recognized rights of action. Real property ownership means that the owner can dispose his property for any (legal) purpose, including delegating the use right (in whole or partial) to somebody else. A general description is that the real property owner has the *right to use*, the *right to manage*, the *right to exclude*, the *right to added value* and the *right of transfer*. Ownership of real property can therefore be seen as a relationship between a human or legal person and land (Mattsson, 2004; Henssen, 1995). See figure 1.

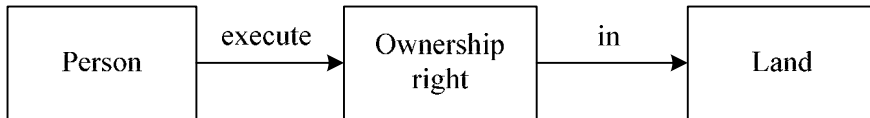


Figure 1. The ownership right relation between person and land. Based on Henssen (1995) and Mattsson (2004).

The *right to use* is the right to use the property for any (legal) purpose the owner wants. The right does not imply that the owner carries out his right by himself. He can transfer the right to somebody else. The *right to manage* is to decide how and by whom the real property shall be used. The owner can decide which conditions that may apply to e.g. a rent or who shall have access to the real property. The *right to exclude* is the right to exclude anyone with no valid, legal permission of entry from the real property. The *right to added value* is the right to financial income from the property, e.g. by collecting a rent or by harvesting the crops growing on the property. The type of value depends on the nature and use of the property. The *right of transfer* is the right to transfer the real property according to the owner's choice. The owner is entitled to sell or give away his real property.

These rights are as a collection sometimes with a single term referred to as ownership right and sometimes called a *bundle-of-rights* (Meinzen-Dick, R. and Mwangi, E., 2008; Alchain and Demsetz, 1973). However, the term must not lead us to think that the rights in the bundle can be separated at the right holder's pleasure, e.g. by selling specific rights individually. One or more rights in the bundle may indeed be subject for sale depending on national legislation, but it would in regard to ownership of real properties in this author's opinion be more suitable to speak about real property functions (Ekbäck, 2000, pp. 31-32).⁴ The term is hereafter used throughout this article.

⁴ Author's translation of the Swedish term "fastighetsfunktioner."

Real property ownership is generally *negatively* defined, meaning that everything which is not prohibited, is allowed.⁵ Ownership of real property is therefore “flexible”, which means that it is “reduced” by public regulations, and “expands” back when the regulation is removed (Bergström, 1956). Ownership of real property does therefore in reality not mean that the real property owner can execute so-called *absolute ownership* on the property. Absolute ownership is when the owner is in full control of all real property rights (Ekbäck, 2000; Bergström, 1956). If so, he would be able to build e.g. a nuclear power plant on his property without seeking any permission. Organised society does however not function like this today. The owner’s *effective* ownership right may therefore be rather limited depending on the number and/or nature of publicly imposed regulations and valid at a specific time (Ekbäck, 2005, p. 195). The regulations do not delete the owner’s real property functions completely, but they lay latent and are “restored” when the regulation is removed or reduced. The ownership right “expands” back towards absolute ownership when the public regulation is removed or limited. This negative defined concept of ownership is common in most western legal systems, giving the owners, in theory, the right to perform the activities they want with or on their property, however limited by other legislation.

4 The structure of public regulations

Public regulations influence the owner’s effective ownership right in different ways. A theoretical departure for describing the structure of public regulations is that they are limiting or benefitting the landowner’s use of his real property (Paasch, 2008). This is illustrated in section 4.1 by using a few common Swedish public regulations to illustrate the influences public regulations may have on real property ownership. In section 4.2 the initial analysis is further developed to formulate a classification for public regulations, which also is exemplified with Swedish examples.

4.1 Public regulation functions

Apart from legal restrictions, the outer limits of a negatively defined ownership are only circumscribed by economic and social factors.⁶ As a support and illustration of the influence of public regulations the graphical model of real property ownership in figure 2 below is used. The model is built on the

⁵ The author is not aware of any society applying a positive principle of ownership, i.e. everything which is not allowed, is prohibited. However, such societies may exist.

⁶ See Bucht (2006) and Ekbäck (2000) for an overview of economic and social factors in regard to land use.

previously mentioned concept of a negatively defined ownership, where the property owner can utilize a number of real property functions (abscissa) to various extents (ordinate).

Different types of public regulations (white area) prohibit or restrict the owner's utilization of certain real property functions. The functions not restricted constitute the remaining effective ownership functions (shaded area).⁷

Starting on the right hand side of figure 2, some functions may not be utilized to any extent at all. This may be exemplified with the restriction that erections of new buildings require a building permit [*bygglov*] (Planning and Building Act [*Plan- och bygglag*], ch. 9).⁸ This restriction – or prohibition of illegitimate building activities – is general and applies to all areas in Sweden. It is prohibited to construct buildings or conduct (major) changes on existing buildings without permission for each planned building project.⁹

The granting of a building permit would, as a result, restore (parts of) the owner's now latent absolute ownership right to use this specific property and be a benefit compared to the initial situation. Such a restoration of ownership functions is illustrated with a cross hatched area on the right side in figure 2.

The possibilities to erect new buildings can also be determined by municipal development plans [*detaljplaner*] (Planning and Building Act, ch. 4).¹⁰ In a development plan, different areas may be designated for specific purposes such as housing, industry, offices or public spaces such as roads, parks or nature areas. The plans are legally binding. If a real property is subject for e.g. detached or semidetached houses the owner is guaranteed the right to build according to the plan, which expands his right to use his property, compared with the initial situation. If a plan, on the other hand, dictates a public space on a property, the owner has no right to build at all. This means that any application for a building permit will always be denied.

⁷ A public regulation may affect the entire real property or only a part of it.

⁸ Approx 25.000-30.000 building permits are adopted each year according to Statistics Sweden's website [*Statistiska Centralbyrån*], www.scb.se, 2012-05-15.

⁹ Special exceptions may apply under certain conditions. It is e.g. possible to build small garden sheds (cabins), barns and other buildings for farming purposes without permission.

¹⁰ Approx 2.000 municipal development plans are created each year according to Swe-dish National Board of Housing, Building and Planning's website [*Boverket*], www.boverket.se, 2012-05-15.

Another public regulation, with quite an opposite effect, is the obligation to maintain and manage productive forests, if present on the owner's property. These forest management obligations [*skogsvårdsåtgärder*] are described in a forest management plan [*skogsbruksplan*] with instructions for reforestation and maintenance, according to the Forest Management Act [*Skogsvårdslag*].¹¹ These regulations contain obligations for the owner to perform certain activities, which then becomes a contrary to the previous mentioned prohibition. The forest management obligations are general and apply to all areas containing productive forests in Sweden. The obligation to utilize certain functions is illustrated with a vertical lined area in figure 2.

In the centre of figure 2 the real property functions can be utilized to a certain extent, but not in excess of that. An example is the right to build so-called supplementary buildings [*komplementbyggnader*], such as detached garages, sheds and other smaller buildings on properties with already existing dwellings (Planning and Building Act, ch. 9). They are - as their name indicates - a supplement to the existing building(s) on the property, and there are certain limitations regarding their size and height. Erection of these supplementary building do not require a building permit, as long as the dimension limitations are not exceeded.

Finally, on the left hand side of figure 2 the owner has access to all real property functions. The functions not affected by any regulation are here summarised to functions not affecting society or land use in a significantly negative way, e.g. the owner's right to reside on his property or in buildings (Ekbäck, 2000, p. 33).

¹¹ Approx. 400.000 Swedish real properties are required to establish forest management plans, according to e-mail communication with Lantmäteriet, the Swedish mapping, cadastral and land registration authority, 2012-01-26.

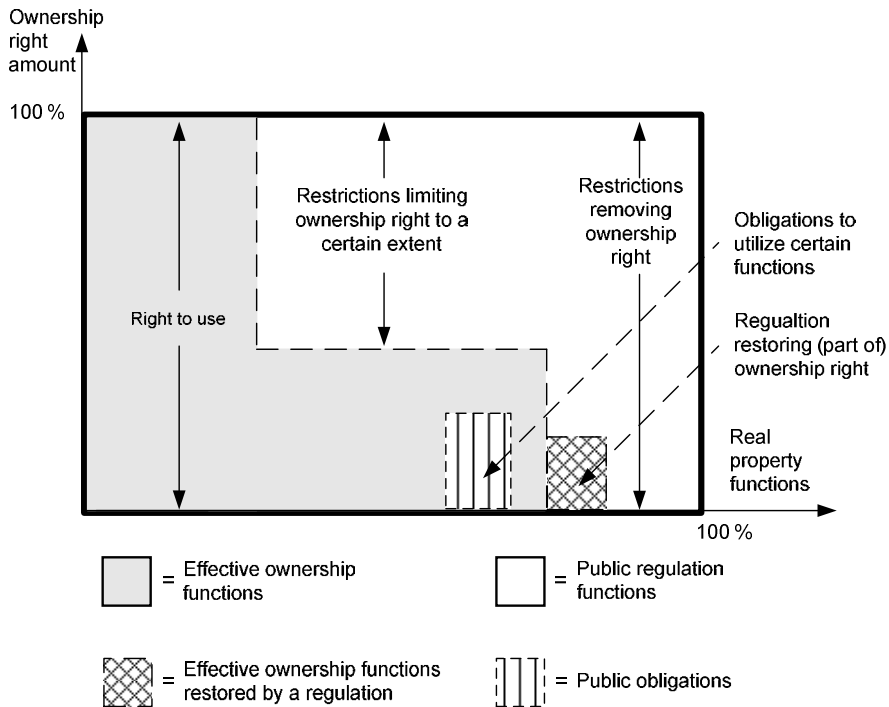


Figure 2. Public regulations influencing property right ownership. Based on Ekbäck (2000).

4.2 Classification of public regulation functions

Any attempt to formulate a comprehensive list of public interest goals which may be used to justify regulation would be futile since what constitutes the public interest will “vary according to time, place, and the specific values held by a particular society” (Ogus, 1994, p. 29).

However, the analysis of real property functions and public regulation functions in the previous sections have revealed that the public interest in land can be classified into three groups according to the functions they execute:

- Public regulations creating a *prohibition* for the real property owner to perform certain activities on his real property
- Public regulations creating an *obligation* for the real property owner to perform certain mandatory activities on his real property.
- Public regulations creating an *advantage* (i.e. a permission /dispensation/concession), allowing the real property owner to (i.e.

voluntarily) conduct certain activities on his property. Any permission is an interaction with a prohibition or obligation. There would be no need for any permission without one of these limiting regulations.

The three groups above can further be sub-divided into:

- *General regulations*, i.e. regulations affecting a certain type¹² of real properties, i.e. being general in nature.
- *Specific regulations*, i.e. regulations created by a specific decision for a limited and defined set of real properties.¹³

We can now establish the following categories for classifying public regulations: *General prohibitions* and *general obligations*, *specific prohibitions* and *specific obligations* and *specific advantages*. It seems even conceptually possible to identify advantages affecting a certain type of real properties on a general level as *general advantages*. The regulations are described and exemplified with Swedish regulations below:

General prohibitions are regulations prohibiting activities on certain types of real property, at a general level. Each type of real property is affected to a certain extent as specified in the regulation. Examples are:

- 1) The general requirement of building permit for building activities. This was previously mentioned in section 4.1.
- 2) Coastal protection regulations [*strandskydd*] along the Swedish coast, lakes and streams. The content of the regulations are e.g. to prohibit the construction and alteration of buildings and other facilities located within 100 meters from the shoreline (shore protection area). The purpose of the restriction is to provide access to water for the general public and avoid over-establishment of e.g. leisure homes (Environmental Code [*Miljöbalk*], ch. 7).
- 3) Prohibition of environmentally hazardous activities [*förbud mot miljöfarlig verksamhet*] (Environmental Code, ch.11). The purpose

¹² By “type” this author does not mean any specific ownership construction or legal construction of real property, but the function of the property, e.g. being subject for industrial forestry, properties within urban areas or properties containing cultural monuments.

¹³ A public regulation may affect an entire real property or only a part of it.

of the restriction is to prohibit or control activities harming the environment, such as pollution, by a requirement of a permit for such activities.

4) The protection of ancient remains [*skydd för fasta fornminnen*] (Heritage Conservation Act [*Lag om kulturminnen m.m.*], ch. 2). The purpose of the regulation is to protect ancient remains of historical and cultural value, and involves a prohibition to remove, disturb, cover, alter, damage etc. any ancient monuments or remains without permission. The regulation applies to all real properties, even those containing previously unknown ancient remains.

5) Non-building zone within 12 meters from public roads (Road Act, 47 § [*Väglag*]). The purpose of the restriction is to prohibit the construction of new buildings near public roads.

6) The prospecting for and exploitation of minerals in Sweden are prohibited without permission. Exploration permits [*undersökningstillstånd*] for prospecting for minerals and exploitation concessions [*bearbetningskoncession*] are required. The mandatory requirement for permissions are here seen as prohibitions since they normally are granted to others than the real property owner. They thereby limit the use of real property and also prohibit the owner from excluding the permission holders (Minerals Act [*Minerallag*]; Johnsson, 2010, pp. 53-54).¹⁴

7) Public access to public and private land for recreation purposes [*allemansrätt*]. The land owner cannot deny public access to his (rural) land for recreation purposes. It is e.g. allowed for the public to collect berries and to camp in the forests (Sandell and Svenning, 2011).¹⁵

¹⁴ The exploitation and extraction of minerals are here defined as prohibitions limiting the owner's right to use his property. However, permissions may even be seen as an general obligation for the owner not to restrict the access of other on his property, depending on the view of the classifier. The right of exploitation and extraction may theoretically even be granted to the real property owner, thereby becoming an advantage for him, reclaiming parts of his latent real property functions.

¹⁵ Public access is here described as a general prohibition not to exclude the public. It may however be argued that the owners requirement may be classified as an obligation for the owner to allow public access on his property.

General obligations are regulations demanding activities to be performed on certain types of real property, at a general level. Each type of real property is affected to a certain extent as specified in the regulation. Examples are:

- 1) The obligation to maintain and manage productive forests. This was previously mentioned in section 4.1.
- 2) A general duty for maintenance of dams and other water structures [*underhållsansvar*]. The purpose of the obligation is to avoid damage and secure public and private interests in water areas (Environmental Code, ch. 11).
- 3) Maintenance of production on agricultural land, which may not be withdrawn from agricultural production without prior notification/permission (Environmental Code, ch. 12). The purpose is to protect national food supply and the cultural landscape of the countryside.

Specific prohibitions are restrictions prohibiting certain activities, based on specific decisions for each prohibition for a limited and defined set of properties. Each real property is affected to a certain extent as specified in the regulation. Examples are:

- 1) A municipal development plan may e.g. involve a prohibition to erect new buildings on certain properties within the plan area. This was previously mentioned in section 4.1.
- 2) It is also possible to perceive a rejected or denied application for a building permit, in a single case, to fit the class of specific prohibitions. When the decision comes into legal force, the potentials for building activities according to the application are completely extinguished.
- 3) There are several types of area protections with different objectives, stipulated in the Environmental Code (ch. 7). These can be established for a defined area by single decisions, and may include nature reserve [*naturreservat*], culture reserve [*kulturreservat*], water protection area [*vattenskyddsområde*], or environment protection area [*miljöskyddsområde*], to mention a few. Within these each established zone, specific restrictions regarding land use are stated in the decision.

4) Extension of the shore protection area, above the general 100 meters previously mentioned (in the group of general prohibitions). By decision, the shore protection area may be extended up to 300 meters in certain locations, e.g. with very high values for outdoor life and recreation.

Specific obligations are regulations demanding activities to be performed by the owner on specific (sets of) real properties and based on specific decisions. Each real property is affected to a certain extent as specified in the regulation. Examples are:

1) A municipal development plan may contain regulations that specify certain mandatory measures to be undertaken, in order for a property to be developed. Such measures could involve water and sewage solutions, establishment or alteration of private roads connected to the public roads network.

2) Buildings classified as a cultural or architectural heritage building [*byggnadsminne*], according to the Heritage Conservation Act [*Lag om kulturminnen m.m.*], ch. 3). The purpose of the protection is to maintain and preserve the nation's heritage, and the decision to protect a building usually stipulates specific maintenance obligations.

Specific advantages are permissions, dispensations and commissions allowing the real property owner to conduct activities otherwise restricted on a real property. An advantage is an admission for the owner to "reclaim" parts of his latent real property functions limited by the restriction, i.e. creating an *advantage* in relation to other owners affected by regulations, but not having obtained any permission. Examples are:

1) A municipal development plan can establish a guaranteed right to undertake building activities, according to the plan's regulations. This was previously mentioned in section 4.1.

2) The actual decision to grant a building permit can, consequently, also be classified as a specific advantage.

3) Permission to conduct environmentally hazardous activities within a specific area (Environmental Code, ch. 9). The permission allows the real property owner to perform certain activities otherwise prohibited by public regulation (in the class of general prohibitions).

4) Permission to erect buildings or perform other activities within different types of nature- or cultural protection areas, like nature reserves or shore protection zones, which are prohibited without permission (Environmental code, ch. 7). The permission allows the real property owner to perform certain activities otherwise prohibited by general prohibitions or specific area prohibitions.

Conceptually, advantages can also be affecting certain types of real property at a general level. They are here called *general advantages*.

General advantages are not general permits valid for specific types of properties as such, but the result of changes in legislation restoring parts of the owners' original real property functions for a certain type of real property.

An example is a change in the previous Swedish Planning and Building Act of 1987, ch. 8, on January 1st 2008 to allow real property owners to construct a garden shed or cabin [*friggebod*] measuring up to 15 square meters without applying for a building permit instead of the previous limitation of 10 square meters. The change in legislation expanded the owners' right to use real property, i.e. to build a larger shed than before.

A change in legislation can of course also further reduce the owners' real property functions if adding or strengthening a general prohibition or obligation. This, however, is another group of public regulations already accounted for.

5 A public regulation model

The previous section has shown that public regulations can be divided into a small number of categories based on how they influence real property ownership and whether they are general or specific regulations.

The model developed in this section is based on the Person – Ownership right – Land relation illustrated in figure 1 and the classification developed in the previous section. The model is shown in figure 3.

One of the challenges of classifying objects is taxonomy, the naming of things. (English) legal and other literature contain a huge number of terms which might be used to name and describe the public regulation functions.¹⁶ The terms *general*, *specific*, *advantage*, *restriction*, *prohibition*, *obligation*

¹⁶ See e.g. Hohfed (1913; 1917).

and *permission* are by this author considered to be a first “best fit” for describing the functions of public regulations in regard to land use.

The model is based on the concept that public regulations can be divided into restrictions and advantages, being limiting or beneficial to real property ownership. The main classes influencing ownership are in the model in called *Public restriction* and *Public advantage*.

The *Public restriction* class can be subdivided into a *Public general restriction* and a *Public specific restriction* class.

The *Public general restriction* class can be divided into two subclasses based on that general restrictions can be either prohibiting certain activities or mandating certain activities to be performed on the real property. The classes are here called *Public general prohibition* and *Public general obligation*.

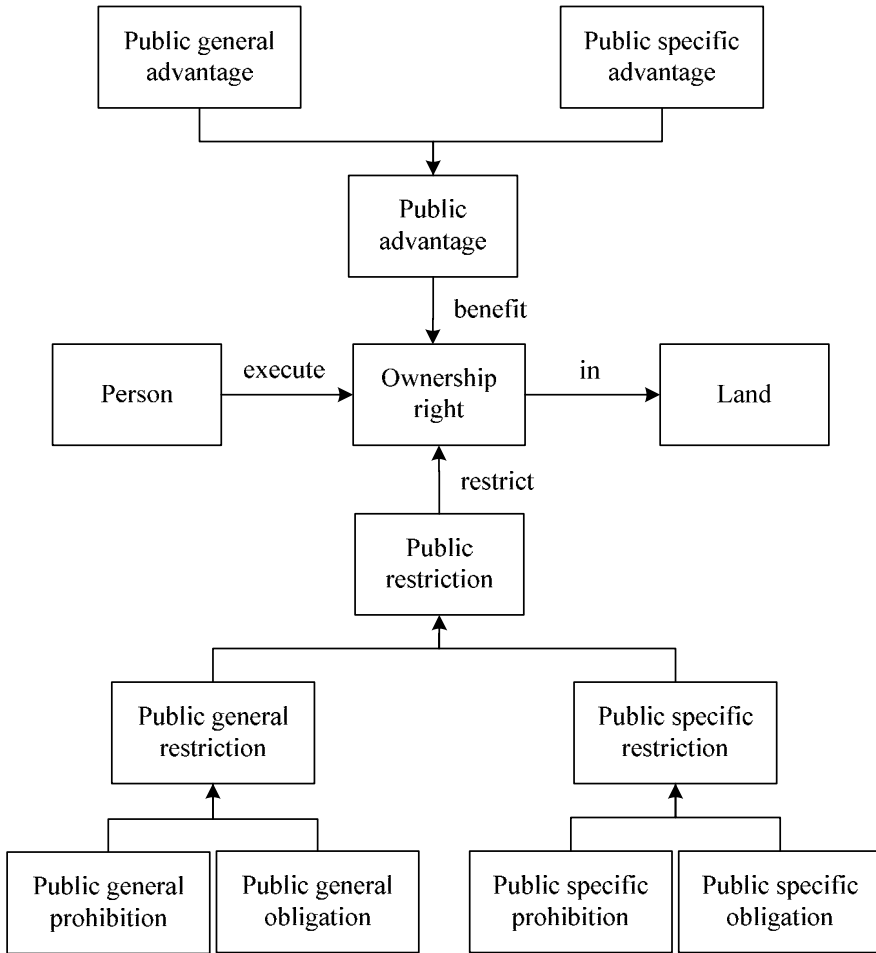


Figure 3. A classification of public regulations.

The *Public specific restriction* class is also divided into a prohibiting and a mandating class, here called *Public specific prohibition* and *Public specific obligation* classes.

The *Public advantage* class is divided into subclasses based on whether the advantage is the result of a general advantage or an advantage resulting from a specific decision.

The classes are here called *Public general advantage* and *Public specific advantage* classes. The proposed definitions for all classes in the model are listed in table 1 (appendix 1).

6 Conclusion and further research

Public regulations are the result of cultural, economic and historical processes in each country. Consequently, a standardized model which classifies public regulations on an international scale may at first not seem possible. However, this article has shown that it seems to be possible to categorize the otherwise wide concept of public regulations regulating land, water and air into rather few categories. The classification is based on how they influence real property ownership.

6.1 Verification of hypothesis

The hypothesis stating that it is possible to create a model for classifying public regulations according to their influence on real property ownership is – judging from the Swedish examples described in the article – verified.

The analysis also showed that (Swedish) public regulations are not limited to executing a single function. They may contain e.g. restrictions, obligations and/or advantages in the same regulation, placing the same regulation in different parts of the model developed in section 5.

That it is not possible to establish a one-to-one relation between a regulation and a class in the model is by this author not a problem for the model as such, but must be taken into consideration if the model is used for registration purposes in e.g. national land management systems.

6.2 Future research

The development of the public regulation model is limited to studies in Swedish legislation. The articles by Paasch (2005; 2008) served as basis for the model developed here, are also exemplified with Swedish legislation. Using a single nation's legislation for validation of a hypothesis on international classification of legal objects is however insufficient to produce a scientific reliable outcome, but serves as a first result. Research in other national legislations is therefore needed to verify, further develop or falsify the proposed classification.

Public regulations have been analysed concerning their influence on real property ownership. It is however notable that public regulation functions also influence use rights granted by the real property owner to somebody else, e.g. a lessee. The lessee is executing a granted use right on the real property and may in some regards have rights and commitments almost equal to ownership depending on the conditions in the lease. His use right is therefore also affected by the public regulations since he cannot do what he wants on the real property.

Another area of research is how the classification of a regulation can change through an application process. An example is an exploitation concession for the extraction of minerals. The mandatory requirement for a concession is classified as a general prohibition according to the model developed here, i.e. the owner cannot exploit the minerals. If a concession is granted to a non-owner of the property it will become a specific restriction for the owner not to exploit the mineral within a specific area. The prohibition may also be classified as an obligation, since the real property owner is not allowed to exclude the right holder from entering the property. If the commission however is granted to the owner of the real property, the commission becomes a specific advantage by restoring (parts of) the owners original ownership rights. A study of the processes and institutions involved in changing the classification of a regulation would further the development of the model.

Aspects of public regulations influencing granted rights such as easements or usufructs on a property are also a subject for future research.

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Swedish Government

Appendix 1

The definitions are arranged according to as they appear in the model in figure 3, describing the public advantage classes, the Person – Ownership – Land relation classes and the public restriction classes.

Definitions of the classes in the public regulation model in section 5.

Class name	Definition
<i>Classes beneficial to real property ownership</i>	
<i>Public general advantage</i>	Change in legislation beneficial for certain types of real property at a general level, e.g. properties within urban areas, properties being subject for industrial forestry or properties containing cultural monuments. Beneficial to real property ownership.
<i>Public specific advantage</i>	Publicly granted permission to perform activities for a limited and defined set of real properties, otherwise regulated by a <i>public specific obligation</i> or <i>public specific prohibition</i> , thereby restoring parts of the owners use right.
<i>Public advantage</i>	Publicly imposed action which is beneficial to ownership and use of real property (Paasch 2008, p. 127).

Class name	Definition
<i>Person – ownership right – land relations</i>	
<i>Person</i>	Human or legal person, state, municipality or other private or governmental authority who owns real property according to legislation (Paasch, 2008, p. 123).
<i>Ownership right</i>	Right to own real property according to legislation (Paasch, 2011, p. 105).
<i>Land</i>	Surface of Earth which is regulated through ownership. Land is the surface of the Earth and the materials beneath. <i>Note:</i> Water and the air are also considered land in some legislation (Paasch 2008, p. 124).

Class name	Definition
<i>Classes restrictive to real property ownership</i>	
<i>Public restriction</i>	Publicly imposed restriction prohibiting or mandating certain activities on real property. Limiting to real property ownership.
<i>Public general restriction</i>	Publicly imposed restriction prohibiting or mandating certain activities on certain types of real property at a general level, e.g. properties within urban areas, properties being subject for industrial forestry or properties containing cultural monuments. Limiting to real property ownership
<i>Public specific restriction</i>	Publicly imposed restriction on doing certain activities or demanding certain obligations for a limited and defined set of real properties, based on specific legislation. Limiting to real property ownership
<i>Public general prohibition</i>	Publicly imposed prohibition affecting certain types of real property at a general level, e.g. properties within urban areas, properties being subject for industrial forestry or properties containing cultural monuments. Limiting to real property ownership.
<i>Public general obligation</i>	Publicly imposed restriction demanding certain activities on certain types of real property at a general level, e.g. properties within urban areas, properties being subject for industrial forestry or properties containing cultural monuments. Limiting to real property ownership.
<i>Public specific prohibition</i>	Publicly imposed restriction prohibiting certain activities for a limited and defined set of real properties, not to be performed by the real property owner. Limiting to real property ownership.
<i>Public specific obligation</i>	Publicly imposed restriction demanding certain activities from the real property owner, for a limited and defined set of real properties, based on specific legislation. Limiting to real property ownership.

