

# Country Report 2003

(Based on the PCGIAP-Cadastral Template 2003)

## Denmark

Country/state for which the indications are valid:	Denmark
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### I. Country Report

#### A. Country Context

##### *Geographical Context*

Denmark is a part of Scandinavia and a member of the European Union. The total area is 43,000 sq. kilometres (not including the Faeroe Islands and Greenland). The population is around 5.3 million of which 85% live in the cities and towns. About one third of the population lives in the capital area of Greater Copenhagen.

Denmark is a low-lying country, its highest point rising 175 metres above the sea. Approximately 10% of the country is used for urban areas and transport installations, 67% is agricultural land, 12% is forests, and the rest is semi-natural areas such as heaths, lakes and streams. Denmark consists of Jutland, a peninsula, two major islands Zealand and Funen, and an archipelago of around 400 islands of which around 80 are inhabited. The total coastline stretches for some 7,300 kilometres.

##### *Historical Context*

Denmark has a long history as an independent kingdom. Since the end of the Viking period around the year 1050 the territory of Denmark has been governed by Danish Kings. A strong cultural identity has been developed throughout the years.

##### *Current Political and Administrative Structures*

Denmark is a constitutional monarchy governed by a representative democracy organised in three levels: at the national level there is parliament with legislative power and ministries responsible for certain fields; at the regional level there are 14 country councils responsible for different sectors; at the regional level there are 14 county councils responsible for regional matters such hospitals, upper secondary schools, major roads, rural planning and administration; at the local level there are 275 municipal councils responsible for all local public function. On average a municipality has around 200,000 inhabitants.

### ***Historical Outline of Cadastral System***

The Danish cadastre, which derived from the results of the enclosure movement, was established in the year 1844. From the beginning the cadastre consisted of two parts: the cadastral register and the cadastral maps. Both of these components have been updated continually ever since.

As a result of the enclosure movement in the late 1700's, the former feudalistic society was changed into a society based on private ownership to land. The resulting property framework from the enclosure movement formed the basis for the new cadastral maps. Each map, in the scale of 1:4000, includes a village and the associated cultivated areas. The provincial towns were surveyed separately based on a provision from 1863 most of them in the scale of 1:800.

Even if the primary purpose of the cadastre was to levy land taxes (based on the yielding capacity of the soil), the cadastral identification was also used to support the land ownership and land transfer system. The Land Registry System was established 1845 at the local district courts for recording and protecting legal rights of ownership, mortgage, easements and leases for land.

## **B. Institutional Framework**

### ***Government Organizations***

The National Survey and Cadastre under the Ministry of Environment is responsible for geodetic and small-scale topographic mapping, nautical charting, and for maintaining and updating the cadastral register and the cadastral maps. Legal rights to land such as ownership, mortgage, easements and leases are recorded in the Land Book at the local districts courts under the authority of the Ministry of Justice. The land book is based on the cadastral identification of the land parcels.

### ***Private Sector Involvement***

Cadastral surveying or surveying for legal purposes is the responsibility of licensed surveyors in private practice. There are about 100 private surveying firms employing about 300 surveyors in total. The cadastral work is controlled through very detailed regulations in the Cadastral Act. Next to cadastral work the private surveying firms carry out engineering surveys and mapping tasks, and offers consultancy on legal and managerial issues concerning land use and property rights.

### ***Professional Organization or Association***

The surveying profession in Denmark is organised under The Danish Association of Chartered Surveyors (DdL) under three main groupings: The private licensed surveyors being the owners of the private surveying firms; the surveyors employed in the private surveying firms; and the surveyors employed in the public sector or in the private sector outside the private surveying firms. There are about 900 active surveyors in Denmark (as per January 2002) out of which about one third is engaged in the private surveying firms. The total number of surveyors is about 1200 included pensioned members, student members, etc.

### ***Licensing***

Cadastral work, or surveying for legal purposes, in Denmark is a monopoly of licensed surveyors in private practice. The Minister of the Environment grants the license to surveyors after having completed a five-year University degree, M.Sc. in Surveying, Planning and Land Management, and having worked for a private surveying firm for three years. There is no further examination to be passed.

### ***Education***

Surveyors can only obtain their education at Aalborg University as a five-year course of study for a M.Sc. in Surveying, Planning and Land Management. The curriculum consists of one year of basic studies followed by two years of general studies and examinations in the main fields of

surveying and mapping, GIS, cadastre and land-use management, and spatial planning. During the last two years of studies the students have the opportunity of specialising in certain fields of the surveying profession. The final half-year term takes the form of a final project for the dissertation thesis. About 30 students graduate each year.

## **C. Cadastral System**

### ***Purpose of Cadastral System***

Over time the Danish cadastre has changed from being primarily a basis for land valuation and taxation to a legal cadastre supporting a land market. Today the cadastre has a much broader objective, and it is accepted that when cadastral information is a part integrated information systems it can improve the efficiency of the land transfer process as well as the overall land management process. The last two decades has seen moves to establish a complete computerised cadastral information system. In short, the Danish cadastral system has met the challenge of adapting to the modern digital GIS-environment.

### ***Types of Cadastral System***

There is only one type of cadastre covering the total territory of Denmark. However, one may argue that the strata titles have a separate status since they appear only in the land book as a horizontal subdivision of the buildings on a property (land parcel) that is identified in the cadastre.

### ***Cadastral Concept***

The Cadastral System in Denmark is organised as follows:

- The cadastral register identifies real properties - which might include more than one parcel - by cadastral number(s) and area;
- The cadastral map shows all land parcels graphically;
- Legal survey measurements are used to precisely identify all new parcel boundaries determined by cadastral surveys such as subdivision, etc.; and
- The Land Book identifies the legal rights based on the cadastral identification.

The term "property" is a legal term defined in the cadastral act to include one or more land parcels as determined in the cadastral register. The properties are then used as a basis for securing legal rights such as ownership and mortgage that must include the total property. A land parcel being a part of a property may only be sold or mortgaged separately when first divided from the real property through a subdivision process. Normally, however, a property consists of one parcel only. Buildings are part of the property. The property concept is also used to control the use of land e.g. through the Agricultural Holdings Act, the Building Act, the Planning Act, etc.

If a part of a property is adversely occupied for a continuous period of 20 years a person may apply for adverse possession. The title can then be changed to reflect what is on the ground. This issue is dealt with by the licensed surveyors through the process of boundary determination.

### ***Content of Cadastral System***

The cadastre covers the total of about 2.5 million land parcels representing about 1.5 million properties. It consists of a parcel register (parcel/cadastral number, area, identification of the properties consisting of more than one parcel, and obligations concerning farming and forestry); country wide digital cadastral maps; a register of control points (about 360,000 points); and an archive of the legal survey measurements (about one million sheets) and the old analogue cadastral maps (about 15,000 sheets). The cadastre is updated daily. Both the cadastral register and the cadastral maps are computerised, and the cadastral information is available on the web.

The Land Book records legal rights in land such as ownership, mortgage and easements. The Land Registry at the local district courts also includes the paper archives of the legal documents. The Land Book is based on the cadastral identification (unique cadastral number) of the land parcels and properties. However, the cadastral maps and the legal survey measurements are held at the National Survey and Cadastre and are not available at the Land Registry offices. The Land Book is computerised and the information is available on-line.

In Denmark, all registers of property data have been computerised. The registers are formed into a network of subsystems to accommodate the use of digital mapping and to facilitate land use management. The National Survey and Cadastre is responsible for the coordination.

## **D. Cadastral Mapping**

### ***Cadastral Map***

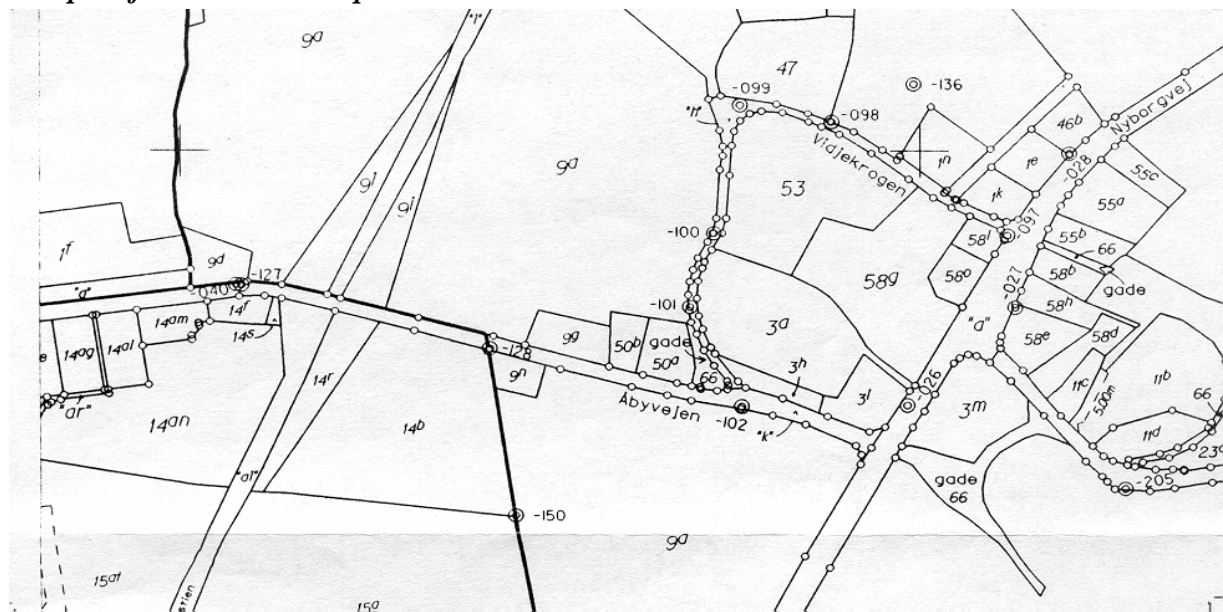
The country wide digital cadastral map, based on the national grid network, was completed in 1997. The digital map is essentially a controlled digitisation of the old analogue "island maps" covering the individual village areas surveyed by plane table at a scale of 1:4000. The map is established in a two-stage process: Firstly, state control points and cadastral surveys connected to the national grid form a "skeleton" digital map. In urban areas about 40 % of the boundary points are entered this way and in rural areas about 20 %. Secondly, the remaining areas were inserted into the skeleton map by transformation often using the digital topographic map as control.

By using this approach the accuracy of the boundary coordinates may vary considerably, ranging from a few centimetres in some urban areas to several metres in some rural areas. Therefore, the digital cadastral map may not totally compare to a digital topographic map. However, it must be considered that the nature and origin of those two kinds of maps are fundamentally different.

It must also be noted that the digital cadastral map is a graphic map, not a numeric map. This means, that the coordinates for the boundary points only represent the boundary position in the graphic map. The final determination of boundaries must be done according to the cadastral regulations. The parcel coordinates in the DCDB therefore may not be used for exact calculation of parcel areas and dimensions.

The procedures for updating the digital cadastral map or DCDB will be just opposite to the procedure for updating the analogue map. In the analogue map new boundaries were adjusted graphically to the position of existing mapped boundaries. In the digital cadastral map any new cadastral measurement will be used for adjusting the position of the existing boundaries. This will establish a process of continual improvement of the accuracy of the DCDB – a dynamic element. The cadastral map may also be upgraded to a higher accuracy in certain areas, e.g. prior to major developments or implementation of major infrastructures.

### ***Example of a Cadastral Map***



The map is linked into the national grid network and is showing only the current cadastral situation. Boundary points shown by circles are established in the map using control points and the legal survey measurements. The digital cadastral database (DCDB) also includes metadata to explain about the nature and origin of the features. The digital cadastral map, this way, is tailored for integrated land management.

### ***Role of Cadastral Layer in SDI***

It is recognised that the Danish cadastre provides a basic infrastructure for managing economic interests in land as well as supporting environmental and development interests. The interaction between the cadastre and the Land Book operates very efficiently even though the two systems are maintained in different organisations.

The Danish concept for integrated land management is organised as a network of interactive subsystems containing the information that are used very often. The automatic linkage between the subsystems is achieved by establishing the "Cross Reference Register" which contains all key identifications within each subsystem (e.g. the parcel number, the building number, the address, etc.) and the cross reference between these identifications. This means that it is possible to obtain all available information on a specific parcel, property or building by knowing only one of the keys. Furthermore, the identification-keys are linked into the relevant physical element represented in the digital maps such as the parcel, the building, etc.

The importance of the cadastre to support land management has steadily increased. During the first half of the 1900's the cadastral system served as a basis for managing the regulations of the Agricultural Holdings Act. During the second half of the century the cadastral identification has also become an important component for managing a number of environmental acts. In addition the cadastre provides the basic information to support activities such as town and country planning processes, construction planning and implementation, and utility administration.

The cadastre is increasingly used as a basic instrument in the planning process. Some local authorities use the cadastre map as the basic layer in the municipal structure planning. This digital process provides a number of opportunities. The land-use regulations are easily identified on the relevant properties with links to the addresses and the name of the owners. The detailed regulations such as zoning and building restrictions can be identified on the relevant properties and located according to the property boundaries. This facility is also used when presenting the planning regulations on the Internet. The citizens can then achieve any relevant planning information just by asking for the specific property.

In conclusion, the cadastral system is serving not only the process of cadastral management and security of land rights. It is also providing a multi-purpose use and facilitates a global

approach to land management through an efficient interaction between the areas of land tenure, land value, and land use. The information in these areas is increasingly available for the mass market through Web-based information systems.

## **E. Reform Issues**

### *Cadastral Issues*

A comprehensive cadastral reform – both legal and digital – was carried out in the 1990's. Therefore, there are no basic problems to be addressed. It could be argued, however, that there is a need to consider whether the cadastre and the land book should be merged into one cadastral system to be managed under the same authority. This might improve the total management of the system in terms of serving the clients.

### *Current Initiatives*

A system of digital lodgement of cadastral data is currently being implemented in order to improve the interaction between the private surveying firms and National Survey and Cadastre and thereby improve the efficiency and effectiveness of the cadastral processes. The digitalisation of the cadastral register and the cadastral maps has paved the way for changing the whole cadastral process into a digital one. The software, entitled MIA, has been developed by the initiative of the National Survey and Cadastre in cooperation with the private surveyors association. By implementing this new concept of digital lodgement still more responsibilities will be placed in the private sector. The initiative is also regarded as one of the pilot projects within the efforts of introducing e-government in Denmark.

## **References**

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Arne Götö (2002): Interactive Graphic Software for Creating Cadastral Alterations. Proceedings of Commission 7, FIG XXII International Congress, Washington D.C, April 2002. FIG Office Copenhagen. [http://www.fig.net/figtree/pub/fig\\_2002/Ts7-9/TS7\\_9\\_goto.pdf](http://www.fig.net/figtree/pub/fig_2002/Ts7-9/TS7_9_goto.pdf)

## II. Questionnaire

### 1. Cadastral Principles

#### *Deed or title registration*

- 1.1 Is your cadastral system based on deeds registration or on title registration?
- deeds registration
  - title registration
  - other: .....

#### *Registration of land ownership*

- 1.2 By law, is registration of land ownership compulsory or optional?
- compulsory
  - optional
  - other: .....

- 1.3 If felt necessary, please, comment how registration works in practice, and what the legal consequences are for not registering a land ownership title:

In practice, registration becomes compulsory due to demands in relation to the processes of mortgaging, building permits, etc.
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#### *Approach for the establishment of the cadastral records*

- 1.4 Are landowners required to register their properties systematically during the initial establishment of the cadastre or is registration sporadic, i.e. triggered only by specific actions (such as for example sale) ?
- systematic
  - sporadic
  - both
  - all properties are already registered
  - other: .....

## 2. Cadastral Statistics

### Population

2.1 What is the **population** of your country ?

5.3 million

2.2 Please, estimate the **population distribution** between urban and rural areas.

urban:	...85... %
rural:	...15... %
<hr/>	
total:	...100... %

### Number and distribution of land parcels

2.3 Please, estimate the approximate **total number of the smallest uniquely identified land units**, often called "land parcels" in your country, including urban and rural areas ?

2.5 million

*The total number would include all freehold and state owned land, regardless of registered, non-registered or informal holding.*

2.4 What is the approximate **total number of registered strata or condominium units** ? This number would be in addition to the number of land parcels indicated in 2.3 ?

200,000

2.5 For **URBAN areas**, please, estimate the **distribution between the smallest uniquely identified land units, often called "land parcels"** (i) that are legally registered and surveyed, (ii) that are legally occupied but not registered or surveyed, and (iii) that are informally occupied without any legal title (this may include illegal occupation or squatting).

legally registered and surveyed:	...100... %
legally occupied, but not registered or surveyed:	...0... %
informally occupied without legal title:	...0... %
<hr/>	
total:	...100... %

*If the estimation is too difficult or complex using land parcels, you may base your estimation alternatively on the number of people occupying these forms of land parcels.*

2.6 For **RURAL areas**, please, estimate the **distribution between the smallest uniquely identified land units, often called "land parcels"** (i) that are legally registered and surveyed, (ii) that are legally occupied but not registered or surveyed, and (iii) that are informally occupied without any legal title (this may include illegal occupation or squatting).

legally registered and surveyed:	...100... %
legally occupied, but not registered or surveyed:	...0... %
informally occupied without legal title:	...0... %
<hr/>	
total:	...100... %

*If the estimation is too difficult or complex using land parcels, you may base your estimation alternatively on the number of people occupying these forms of land parcels.*



### ***Number of professionals***

Please estimate the total number of *academic professionals* that are active within the cadastral system and the proportion of the time that they actually commit for cadastral matters (as opposed to work outside of the cadastral system) ?

2.7 Total number of **professional land surveyors**, such as licensed surveyors active within the cadastral system:

300

2.8 Proportion of the time that these land surveyors commit for cadastral matters:

...40...%

2.9 Total number of **lawyers/solicitors** or equivalent active within the cadastral system or land market:

1,000

2.10 Proportion of time that these lawyers/solicitors commit for cadastral matters or land market:

...30...%

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### ***Remarks and Comments***

Please, identify the best aspect of this questionnaire ?

It is simple and touches on only the basic statistics necessary for comparison.

Please, suggest the area in the questionnaire that could be improved?

As good as it gets