

Danish Multipurpose Cadastre – Experiences so Far

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Key words: Multipurpose cadastre, restrictions pertaining to public law, new users, top down implementation, quality of the cadastral map.

SUMMARY

In Denmark the cadastral register and the cadastral map are digital. The mayor argument for computerising of the map was broader use of the cadastre. It was assumed that a digital cadastral map together with other digital maps could improve GIS use. Furthermore it was assumed that a digital cadastral map could increase the possibilities for registration of property regulations in the cadastre. The aim was a multipurpose cadastre.

Since 1997 four new themes have been registered in the Danish cadastre. The four all are the registration of regulations according to new land use legislations. Regional authorities carry out the practical registration of the themes. The implementations of the registrations have been top down. The top down implementation and the new users give some challenges for the cadastral authority – the NSC - to make the processes of the registrations of the new themes efficient and to make the quality of the registrations sufficient.

The challenges of the multipurpose cadastre have legal, organisational and technological aspects. The challenges and the aspects are primarily related to the use of a digital cadastral map. Depending on the point of view one of the biggest challenges have been building up and maintaining cadastral knowledge at new users of the cadastre.

In the preparation of registration of a new theme it is important that the legislation authority and the NSC exchange knowledge in a broad sense. The first question from the NSC to the legislation authority is really to find out what is the purpose and why the regulation should be registered in the cadastre. The answer for that can never be too long and detailed.

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1. INTRODUCTION

Danish cadastral register has been computerised since 1986. By the end of 1997 the National Survey and Cadastre (NSC) completed the computerisation of the cadastral maps. The mayor argument for computerising of the map was broader use of the cadastre. It was assumed that a digital cadastral map together with other digital maps could improve GIS use. Furthermore it was assumed that a digital cadastral map could increase the possibilities for registration of property regulations in the cadastre. The aim was a multipurpose cadastre. With finalising the digitalisation in 1997, there have been some years now with the possibility to take the first steps towards a multipurpose cadastre. The experiences so far will be addressed in this article.

The challenges of the multipurpose cadastre have legal, organisational and technological aspects. The challenges and the aspects are primarily related to the use of a digital cadastral map. Depending on the point of view one of the biggest challenges have been building up and maintaining cadastral knowledge at new users of the cadastre.

2. ESTABLISHING A MULTIPURPOSE CADASTRE

2.1 The Danish Cadastral System

The land registration system in Denmark was established in the 19th century as follows:

- the cadastral register identifies real properties - which might include more than one land 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.

When land is to be subdivided or property boundaries changed, both private and public landowners must apply by law to a private licensed surveyor for the necessary legal surveys and for the preparation of documents needed for submission of an application to the NSC for updating the cadastre. The application must contain a copy of the cadastral map showing the alteration of the boundaries, measurement sheets showing the new boundaries, documentation for legal rights, as well as documentation showing the approval of the future land use according to planning regulations and land use laws.

The approval from the NSC, showing the updated cadastral register and the updated cadastral map, is returned to the licensed surveyor. Simultaneously, the approval is forwarded to the municipality, the tax authority, and to the local Land Registry so these authorities have updated cadastral information for their property management. The process of the cadastral

work is controlled by the Subdivision and Land Registration Act, which provides very detailed regulations. To determine the existing boundaries the surveyor must compare the legal survey information (the cadastral map and the measurement sheets) with the real physical layout, placement of fences etc. If discrepancies are found the surveyor has to determine why (Enemark, 1998).

The cadastral register was computerised from 1984 to 1986 and the computerisation of the Land Book was completed in 2000. In 1997 completed the computerisation of the cadastral maps. Over time the Danish cadastre has changed from being primarily a basis for land valuation to a legal cadastre supporting an efficient land market as well as effective land use administration.

2.2 Multipurpose Use of the Cadastre

Today central, regional and local authorities use the digital cadastre for several different purposes concerning land management. Ministries and government institutions use especially the cadastre indirectly in geographical and property related administration by using the parcel identifier as a unique key between a wide range of administrative registers and databases. However, at the governmental level the use of the digital map for GIS purposes is more moderate. By now the digital map has been acquired by the Ministry of Defence, the Ministry of the Environment, the Danish National Railway Agency, the Danish Road Directorate and the Danish Coastal Authority.

There are 14 counties in Denmark. These regional authorities have acquired the digital map. Counties are responsible for several registrations in relation to environmental and planning legislation. In this land use management the counties use the digital cadastral map as a tool for showing which properties have which registrations. Every county show almost all their land use registrations at their website together with the cadastral map and topographical maps and often also together with technical maps.

In the counties' GIS-based management the cadastral information is used in many ways. One is e.g. to use the cadastral map and parcel identifiers as a tool to connect properties shown in a map with names and addresses of property owners in databases. The objectives for this can be land use management in general. It can also be administrative: creating letters to the property owners, or carry out various statistical analyses.

There are about 270 municipalities in Denmark. All except a handful have acquired the digital cadastral map. All but a few of the municipalities use the digital cadastral information similar to the counties. On their websites the regional and local authorities make the land management information accessible for the public. In searching for the information the public can use addresses, parcel identifiers or clicking in the maps. In some authorities' maps there are hyperlinks to the authority's land management files. The key connecting the different management information is mainly the parcel identifier.

The technology improves step by step. In 2003 the NSC introduced a WMS-based distribution (web map services) of the cadastral and topographical maps whereby external

users can access data directly and show their own data on up-to-date background. Users of this new distribution service are mainly authorities and private partners to the NSC.

The cadastral register information has been used in governmental, regional and local land management systems for about 20-30 years. Since the late 1980s other central land management systems have been updated daily with information from the cadastral register. The scope of use of cadastral register information is still increasing. By the finalising of the digitalisation of the cadastral map in 1997, the GIS use of cadastral information began. This use is increasing too. All things considered, the use of the cadastral information in 2004 is very much multipurpose use.

2.3 Multi Registrations in the Cadastre

The reasons for using the cadastre for registration of land use regulations are many. Two major reasons are, that the cadastral map is the only useful map with property boundaries and that the cadastre has a nation wide complete coverage. For more reasons see Christensen, p. 5, 2002.

Depending on the definition there are about 40-70 types of land use regulations used and managed by land management authorities in Denmark. These regulations are registered and mapped in a lot of different registers, maps and databases. Traditionally these regulations have been at analogue topographical maps maintained by the authority responsible for the regulation.

In the last decade there have been some (at least three) governmental reports on how to deal with land use regulations related to properties. The committees working with these reports have consisted of members from different authorities but also private organisations representing different interests in rural areas e.g. agriculture and nature conservation. The objectives of these committees have been to establish better public access to information about regulations, to secure rights of the property owner and to improve the efficiency of the overall land management processes. The reports all point out the importance of clear, transparent and accessible information about land use regulations. The reports also to some extent recommend use of the cadastre and especially the cadastral map as a basis for registration of regulations. The recommendations from these committees have helped in preparing the way for broader use of the cadastre.

For the regulations the basic task is to find out, which properties are covered by which regulations. For that task there is no better tool than a digital cadastre.

2.4 Decision Making and Implementation of a New Theme in the Cadastre

One of the results of the governmental reports on information about land use regulations is that the cadastre has obtained more attention the last 5-8 years from “new” authorities. When legislation is to be drafted for a new regulation in relation to land management where there is a spatial component of the regulation, it is now common in the legislation process that the

authority considers the digital cadastre as a basis for management of the spatial extend of the regulation.

Since 1997 four new land use regulations have been added to the registrations in the cadastre. They are:

- Coast protection zone – registration of seashores according to the Act of Nature Conservation
- Dunes protection zone – registration of dunes according to the Act of Nature Conservation
- Windfall – financial aid for rebuilding forests after windfall according to the Act of Floods and Windfall
- Soil contaminated areas – registration of soil-contaminated areas according to Contaminated Soil Act.

The information about windfall is only registered in the cadastral register. The two coastal protection zones and the soil-contaminated areas are registered in both the register and the map. These four new regulations can be understood as restrictions. But from the perspective of a cadastral authority they can also be seen as themes in the cadastre, which is the term generally used in the NSC.

With the four new themes the governmental body responsible for the legislation made an application to the NSC early so that there could be a clarification of the restriction in the cadastre before the first reading of the new Act in parliament. For the two coastal protection zones and the windfall the authority was the Danish Forest and Nature Agency. For the soil contaminated areas the authority was the Danish Environmental Protection Agency. The forest and nature agency also is the authority of the protected forest theme which has been registered in the cadastre for decades. So the agency has some knowledge and experience with the cadastre. But it is different departments who are dealing with the different regulations. Therefore it has been a task each time for the NSC to explain and communicate the special characteristics of the cadastre.

It is really a critical process that the responsible authority for the legislation and the authority responsible for the cadastre bring out all the necessary information and knowledge needed for the specific legislation. The experiences with the four new themes are that it is quite difficult for the legislative authority to understand the characteristics of the cadastre. It requires technical insight or experience to understand the at the same time static and fluid cadastral information and especially the dynamics of the updating processes. In spite of the above-mentioned problems all contacts by legislative authorities to the NSC for registration of regulations in the cadastre have resulted in the cadastre becoming the registration basis for the new regulation.

In the legislation process of a land use regulation what is having most political attention is the impact of the regulation and not the management of the information. In a hard, complex and maybe also time-boxed legislation process there is a risk that the management of the

information is not sufficiently dealt with for the later practical implementation of the management.

An example of how the cadastre is mentioned in a regulation act is the Contaminated Soil Act from 1999:

14.-(1) The regional council shall ensure that information on listed areas is entered into the parcel register and that said register is kept up-to-date.

(3) A listed area shall be deleted from the parcel register when the regional council is satisfied that ..., there is no foundation pertaining to environmental or health concerns for maintaining the listing of the area in question.

(4) After negotiations with the parcel register authorities, the Minister for Environment and Energy may formulate rules on the registration of the listing of areas, including setting up and operation of the parcel register, use of cadastral maps, and issuance of and payment for information from the parcel register. (Danish Environmental Protection Agency, 2001)

More rules about the registration of the regulation are in the Act. But the above sections illustrate the level of detail in the act. Who are the responsible authorities and where to register is pointed out in the act. The text in the act's sections about the cadastre and the processes is often based mainly on the work of the legislative authority and the NSC. Later when the act has carried in Parliament, the legislative authority, the NSC and representatives from the authorities that are responsible for the practical management of the regulation draft more detailed rules for the management.

All in all it has been a top down implementation of the regulation and the registration of the regulation. Of course the implementation has to be arranged in that way, but the top down approach has some consequences for the practical work with the registrations. Some of these will be explained in the following sections.

3. LEGAL ASPECTS OF THE REGISTRATION OF NEW THEMES

When a legislation authority makes the application to the NSC for the possibility of using the cadastre as the registration basis, the authority maybe have almost made the decision they want to use the cadastre. The NSC looks positively at a broader use of the cadastre. Nevertheless, it is very important at the early stages of negotiations about the possible registration that NSC finds out exactly what the legislative authority wants and expects of the use of the cadastre.

The main purpose(s) of bringing the registration in to the cadastre has to be totally clear:

- Is it to have standardised easy accessible information for land management?
- Is it to give the authorities responsible for the management of the regulation the best possible tool for their management?
- Is it to secure the restriction of the property?
- Is it to secure that property owner does not use the property against the intentions of regulation?
- Is it to show some sort of willingness in making the land use management transparent?

It is important that the cadastral authority finds out what the legal consequences are of the regulation and in a broad sense finds out what the regulation is about. This is necessary, when registration of the regulation is going to be a part of the process of approval and registration of cadastral changes. Furthermore, it is very important to be explicit about what is the legal documentation of the regulation. In the Danish land use regulation acts, different legal and administrative instruments carry the explicit regulation. For the property owner it is not always transparent which is the primary documentation of the registration on the property. Or in other words, what document or information is securing the restriction or the right?

- Is it the definition of the restriction or right in the act?
- Is it the registration of the restriction or right in the local authority's database?
- Is it the registration of the restriction or right in the cadastral database?
- Is it the letter from the authority to the property owner?

The legal documentation of the four new themes are:

- The two coastal protection zones: Government notice signed by the Minister of Environment, when the registration in the digital map of a zone covering a county is finished.
- Contaminated soil areas: A letter to the property owner from the county.
- Windfall: A letter to the property owner from the forest branch. And the registration in the Land Registry to secure against 3rd person.

As mentioned in section 2.4 there are 2 phases of making the rules for the management of a new regulation. One before finalising the act and one later at a more detailed level for the management of the registration and updating processes. In the work with making the rules a lot of questions have to be examined and answered. The questions about the legislative authority's expectations about the use of the cadastre, the purposes of using the cadastre and the question of the legal documentation are examples of questions which have to be answered in the first phase.

In the later making of the detailed rules for the management of the regulation it is important to distinguish between three different processes:

1. The registration of the theme by the regulation authority
2. The changing of the registration of an existing object of the theme by the regulation authority
3. The changing of the registration of an existing object of the theme caused by subdivision or changing of the property boundaries.

The experiences with the four new themes are that the rules for the registration and for the changing by the regulation authority have been most sufficient carried out before the practical work started with the processes. The rules for changing registration of a theme caused by cadastral changes have not been completed in the same way before this process started between the legislative authority, the regulation authority, the private licensed surveyor and

the NSC. One of the reasons for that is that two first processes are relatively simple geographically registrations of mapped regulations and that the cadastral caused changing process is a more complex legal changing of properties.

When the detailed rules for 3 different processes of registration and changing are being made some of the questions to be examined are:

- What are the tasks and responsibility for the legislative authority when the registration process has started?
- Is it possible to change an existing registration of theme object in the cadastre?
- Who can approve a change?
- How are the workflows and responsibilities for the three processes?
- Can a property owner get a dispensation for the registered regulation?
- What are the consequences of a dispensation for the process of approval and registration of cadastral changes?
- Do the different types of cadastral changes (subdivision, amalgamation, reallocation etc.) require different rules for the updating and changes of the registered regulation?
- What happens if the cadastral map for some properties with registered regulation is being improved by better measurements?

In 2004 three to five years after the registration of the four new themes started, work is still made to describe and complete the rules for the changing and updating of the theme registrations caused by cadastral changes. Some of the reasons for the continuing work of rules are a lack of resources, a long implementation time at decentralised authorities, and many variants of how themes and the different types of cadastral changes can occur in a file submitted for changing the cadastre.

As mentioned in section 2.3 there are much more land use regulations than the four new themes and some reports recommend the cadastre for registration of even more regulations. In the future there might arise some new consequences and impacts of the registrations in the cadastre if the number of regulations gets high. The land use regulations are according their legislation without compensation for the property owner. Until now and maybe a few years more this bog number of regulations are registered at several authorities and maybe not computerised. But if more and more are registered in the cadastre the information about the regulation will be accessible for the public. And then it might appear in a very transparent way, that some property owners have a lot of land use regulations at their properties. Then some might require justice and compensation for the regulations.

Another more present aspect of justice is that for some regulations the property owner cannot get the exact information by viewing the cadastre because of the legal documentation of the regulation is not the cadastre.

Until now no land use regulation authority or the NSC have had cases tried at the courts. The rights of complaining about the registrations are not very transparent. Though, it is not unlikely that more and more registrations in the cadastre or in relation to the cadastre in combination with better access to the information will increase the pressure from property

owners who wish for exact, trustable property information. If that's not met with convincing information and dialog the risk of a case for court is increasing.

Politically there have been a few small media stories during the last decade about property owners who cannot get proper information about restrictions at their property. It is easy to criticise the, maybe for some plot owners, unsatisfied level of accessible restriction information. Contrarily, it is not easy in the media to communicate the complexity of legal, technical and organisational aspects of land use regulations. With an increasing pressure for accessible, valid information the authorities for these regulations in the future have to improve the quality of the registrations of regulations but they also have to improve the communication about the regulations.

4. ORGANISATIONAL ASPECTS OF REGISTRATION OF NEW THEMES

As mentioned above it has been a top down implementation of the registration of the regulation. According to the acts legislating the registration of the four newest themes in the cadastre, some of the management of the regulations are to be managed by central governmental agencies. Furthermore regional authorities or regional levels of governmental agencies are responsible for some of the management.

The 14 counties in Denmark are managing:

- The coast protection zone.
- The dunes protection zone.
- The soil contaminated areas.

20 local forest branches are managing:

- Windfall - financial aid to the properties.

The practical work with some registrations is decentralised. Rules and agreements for the registration process can be dealt with by organisations representing the decentralised authorities. But often much time is necessary to get the processes to work. With many authorities time is needed to understand rules and agreements and get the new processes running in the regional authority's organisation and by its staff.

In the NSC staff working with the maintaining and updating of the themes are experts in the cadastre. It's their main work. Users at other authorities do not have the same experiences and knowledge about the cadastre. At the regional authorities maybe the staff are experts in the scientific aspects about the registrations e.g. biology and coastal protection line. But knowledge of maps and especially cadastral issues is often at a lower level. The experiences for the NSC are that the use of digital maps and of GIS technology is at a professional level at almost all regional authorities. In contradiction hereto the basic characteristics of a cadastre with the role of the property definition, the importance of relative accuracy and position and the dynamics of the updating process are less known.

Building up knowledge for the registration and updating of the coast protection zone have had two phases. The first registration of the protection zone was carried out by a central

commission who mapped the zone county by county. After that the counties took over the day to day administration of the zone. Therefore some of the knowledge for the registration processes was lost when the administration was transferred to the counties.

The lack of knowledge about cadastre and the cadastre updating processes in the regional authorities means more work in the NSC. The staffs in the NSC have had to answer a lot of questions from the regional staffs about how to make the registration. More work in the NSC also arises from the lack of sufficient rules for practical updating as mentioned in section 3.

In 1998 Professor Enemark called out attention to:

“...However, the real challenge will be to make this advanced product (digital cadastre map) understandable and useful to a wide range of users: They should understand that the digital cadastral map in no way replace or change the legal boundaries; they should understand the nature of this map and the origin of the features....”

(Enemark, p. 8, 1998)

In 2004 this challenge is still one of the mayor challenges in registration of new themes in the cadastre for new users.

The traditionally main task in the cadastral department in the NSC has been the process of approval and registration of the cadastral changes. With the addition of the themes new updating processes have been developed. This requires teaching and training. Until now some have been learning by doing due to the lack of sufficiently the detailed rules for the maintaining and updating. In the cadastral department there has been one team dealing with the two processes of registration and changing of a theme carried out by the regulation authority. Changing of the themes due to cadastral changes of the properties is a part of the normal cadastral files submitted for changing the cadastre. Therefore the normal cadastral updating teams have made these changes of the themes.

When an authority wants its new regulation to be registered in the cadastre, the authority has to pay for the first registration of the theme and for the changing of the theme. Estimating the costs of establishment and continued updating of the new regulations in the cadastre is difficult. Costs of remodelling the data model and the functionality of the system are possible to estimate. The regulation authorities for the four new themes do not pay for the changing of the themes in the process of approval and registration of cadastral changes. The experience in the NSC is that in some cadastral files time spending is much higher due to themes registered at properties in the files. A file can be much more complex with themes and especially if there is more than one theme at the same property or parcel. But the cadastral updating of themes is for free for the themes authorities.

The establishing of a new theme in the cadastre the NSC have been going on for three to five years. During that time different staffs from the NSC have been in the committees. In the future when a new theme is potential for the cadastre the NSC hopes the making of the rules and the workflows can be done faster than with the present themes. When a new application for a new theme in the cadastre is received the NSC will consider this in a more project

oriented way. With the experiences from the four themes there will be made a detailed project plan for the work and based on the experiences from the four themes, checklists will be made for what to remember in the work of implementation of a new theme.

Theoretically it is possible to register local themes in the cadastre when e.g. a county wants a theme of their land management registered in the cadastre. But it is unlikely that NSC will do so. The role of the cadastre is to provide requirements for nation wide coverage. Methods and business rules for updating processes and data model have to be the same in all local and regional areas. Furthermore the implementation costs of a new theme are too high for a non-nation wide theme.

5. TECHNOLOGICAL ASPECTS OF THE REGISTRATION OF NEW THEMES

The technological aspects of the registration of new themes in the Danish cadastre have concerned different issues like quality of the cadastre, data modelling and functionalities and communication facilities for updating a central database.

The information in the cadastral register is reliable for the traditional use of the cadastre. It is seldom that information in the register is incorrect and not trustable. The register information is not an object for interpretation. The register information about the definition of a property is correct, totally clear and understandable. Of course there can be a few wrong informations, but it is very seldom.

About the cadastral map information it is more a question what the information means. The main purpose of the map is to show the position of the boundaries of properties and how parcels are positioned. The relative position of the boundaries has sufficient quality and seldom gives problems. The absolute position often gives problems. Due to the characteristics of the analogue maps that the production of the digital map was based on, the absolute position has a very different quality. It means that the absolute accuracy of the map vary from place to place. This accuracy problem is one of the main challenges in the work with registration of three of the new themes in the cadastral map. The accuracy is important for the regional authorities' registration of the regulation and it is important for updating of regulation boundaries due to the cadastral approval and updating processes.

It is important that the legislative authorities and the staff dealing with the registration and updating at the regional authorities are aware of the accuracy standard. It is also important that the staff in the cadastral department in the NSC knows what the production method of the registration at the regional authorities has been. The different steps of measurement and mapping each contribute to the inaccuracy e.g. the coastal protection line is mapped at an orthophoto after landscape related and legal assessment, and after that mapped in the cadastral map with respect to the parcel boundaries.

Windfall areas are registered on the property unit/parcels. For the coastal protection zones and soil-contaminated areas the registration can be a part of the parcel. It means that for these boundaries themes it is necessary that the registration authority put line information into the database whether the theme boundary follows parcel boundary or not.

An example to illustrate the problem could be the coastal protection zone in the cadastral approval and updating process.

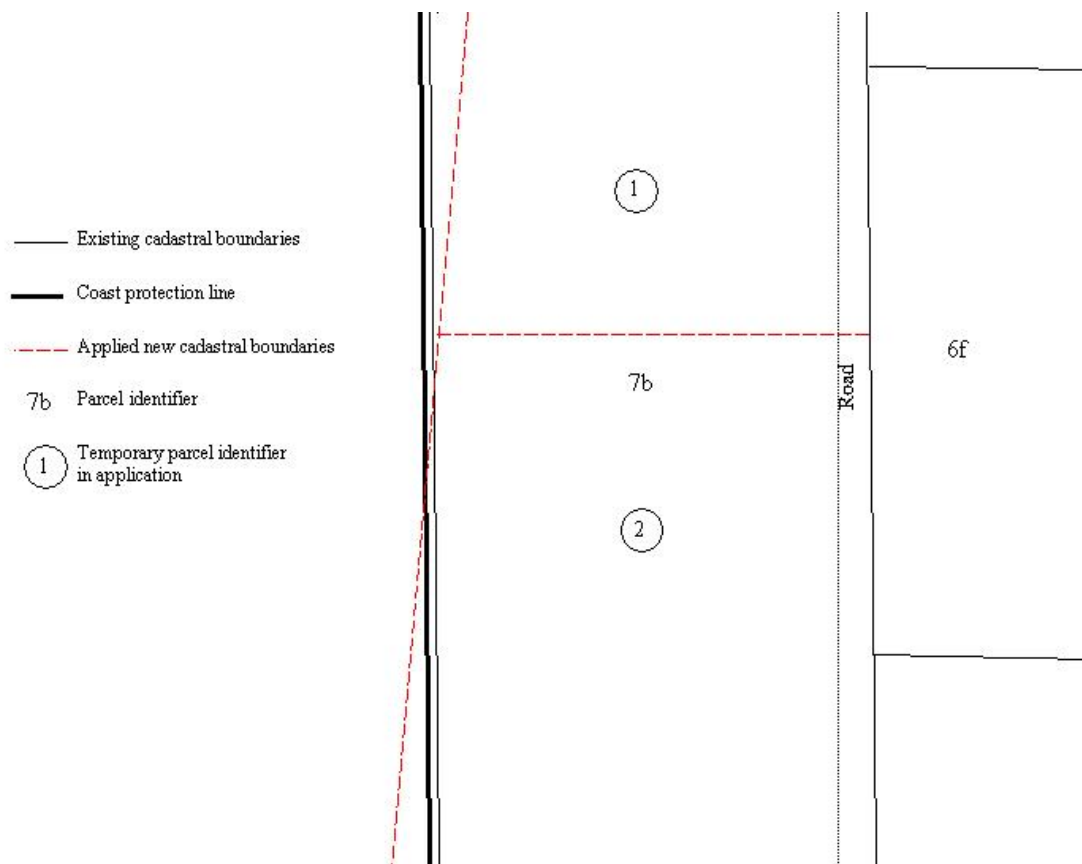


Fig. 1. The Accuracy of the cadastral map can cause wrong decisions in applied subdivision of a property. In the field the coast protection line, the parallel existing cadastral boundary and the applied new cadastral boundary crossing the coast protection line are the same hedge. The measurements of applied new cadastral boundaries have better absolute position and accuracy than the existing information in the cadastre. But at the county the staff has to decline the subdivision application, due to overlap with the coast protection line.

6. CONCLUSIONS

A digital cadastre and especially the digital cadastral map is a good basis for registration of land use regulation. Since 1997 four new themes have been registered in the Danish cadastre. The four all are the registration of regulations according to new land use legislations. Regional authorities carry out the practical registration of the themes. But the implementations of the registrations have been top down. Staffs at the regional authorities are new users of the cadastre and they are new players in the process of approval and registration of cadastral changes. The top down implementation and the new users give some challenges for the cadastral authority – the NSC - to make the processes of the registrations of the new themes efficient and to make the quality of the registrations sufficient. Furthermore the new themes challenge the understanding of what the cadastre is.

The experiences with the four new themes point out some new tasks for the cadastral authority. In the preparation of registration of a new theme it is important that the legislation authority and the NSC exchange knowledge in a broad sense. The legislation authority really has to understand the cadastral context. For the NSC it is important to understand the regulation - what is the legal documentation of the regulation, what are the impacts of the proposed workflows and what technology is required for the wanted quality. But the first question from the NSC to the legislation authority is really to find out what is the purpose and why the regulation should be registered in the cadastre. The answer for that can never be too long and detailed. In relation hereto it is very important that the authority of the legislation and the authority of the management of the theme understand the legal scope of the registration in the cadastre.

6.1 Perspectives

The cadastre is increasingly becoming an obvious system in which to register land use regulations. Hereby, it is expectable that more regulation authorities will request for the spatial extend of their new regulation to be registered in the cadastre. The NSC has to be prepared for these requests.

In January 2004 a commission delivered a report about a new organisational structure for counties and municipalities. It's likely that the main administration of environmental and nature protection acts will become the responsibility of larger municipalities. Consequently, maybe 100 municipalities in contrary to 14 counties will be responsible for proving and managing the updating data about legal restrictions in the cadastre. With respect to the importance of building up and maintaining sufficient knowledge within the responsible authorities this in the view of the cadastral department in NSC is a course for concern. Contrarily, there are possibilities for more efficiency in the updating processes if the updating will be gathered in fewer regional authorities.

The technology gives better and better possibilities for the registration of new themes. One of the biggest challenges regarding themes where regional authorities are responsible for the regulation has been defining the updating processes. New technology with WFS (web feature server) improves the possibilities of decentralised updating in a central database. This is a possible way to the future that regional authorities will be able to work directly with specific objects in the central map database. There will be no need to have copies of the cadastral map in the local GIS systems. And no need to send files to the NSC, for its staff to register the update in the map database/cadastre.

In 2006 a new modernised updating and information cadastral system is expected to be implemented in NSC. In contradiction to present there will only be one database for the cadastral register and the cadastral map. The data model for this will be more flexible and extendable, whereby new themes will be easier to include into the cadastre. An objective of the project of the new cadastral system in the NSC is to standardise the processes, the business rules and the documentation of the existing themes. It'll certainly be a help in preparation of new themes for the cadastre.

The real challenges for new registrations and maybe other types of information in the multi purpose cadastre are legal and organisational issues. It is a challenge to create awareness of the legal condition of the registrations in the cadastre and it's a challenge to define sufficient detailed rules for the registration and dynamic updating of the registrations. Furthermore, it is a challenge to integrate these rules into the workflows at regional or local authorities and to built up and maintain the sufficient cadastral knowledge at these authorities.

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BIOGRAPHICAL NOTES

Background:

1994 M. Sc. in geodesy, cadastral science and planning, University of Aalborg, Denmark
2002- Studying business administration and informatics, Copenhagen Business School, Denmark

Brief career history:

1995 -1996	Principal, National Survey and Cadastre (NSC), Denmark Especially workgroup on a new cadastral system to be used by private licensed surveyors, municipalities and NSC.
1997 – 1999	Principal, Ministry of Housing and Urban Affairs. Project manager for an administrative system for properties owned by the State. Working with coordination of property data between ministries.
2000 -	Principal, National Survey and Cadastre (NSC), Denmark Especially project on modernising the cadastral IT systems.

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