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Bundesamt für Landestopografie
Office fédéral de topographie
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Cadastré 2014 – Still a Vision ?

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FIG Commission 7 – Working Group

Working group 1994-1998 had the mandate to:


- ... study cadastral reform and procedures as applied in developed countries, take in consideration the automation of the cadastre and its role as part of a larger land information system, evaluate trends in this field and produce a vision of where cadastral systems will be in the next twenty years, show the means with which these changes will be achieved and describe the technology to be used in implementing these changes.

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The Six Statements of Cadastre 2014

- Cadastre of the future will show the **complete legal situation** of the land, including public rights and restrictions !
- Separation between maps and registers will be abolished !
- Cadastral mapping will be dead ! Long live **modelling** !
- Paper and pencil-cadastre will be gone !
- Cadastre 2014 will be **highly privatised** ! Public and private sectors are working closely together !
- Cadastre 2014 will be **cost recovering** !



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Two Definitions by Cadastre 2014

- **'Land Objects':**
 - there are other land related objects than parcels
 - important for accommodating public-rights restrictions
- principle of **'Legal Independence':**
 - layer concept known from GIS
 - at first sight mainly a technical issue, but it has crucial management impacts: data can be modelled, acquired and managed independently
 - a common reference system and a common data modelling mechanism have to be used

| Land Parcel | Land Object |
|---|--|
| A land parcel is a piece of land with defined boundaries, on which a property right of an individual or legal person applies. | A land object is a piece of land in which homogeneous conditions exist within its boundaries. A legal land object is identified by the legal content of a right or restriction and the boundaries which demarcate where the right or restriction applies. |

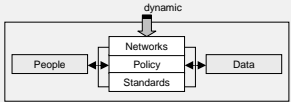
| The principle of legal independence | | |
|-------------------------------------|-------------------------|-------------------------|
| Legal Topics: | Land Object Boundaries: | Rightful Claims: |
| Resource Exploitation | Common reference system | Common reference system |
| Collective Land Rights | | |
| Water Protection | | |
| Indigenous Land Rights | | |
| Environment Protection | | |
| Land Use Planning | | |
| Land Property | | |
| Climate and Energy | | |
| Natural Resources | | |
| Natural Land Objects | | |

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Developments since 1998

- **SDI, NSDI, INSPIRE**
- **Internet**
 - portals, web applications
- **Land Administration**
 - three pillars: process of determining, recording and disseminating information about the **ownership, value and use** of land
 - basis for **sustainable development** (Bathurst Declaration, Land Administration Guidelines) and **good governance**
 - basis for reliable and efficient **land market**, thus for good economic development



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Evaluation – Statement 1

Cadastre 2014 will show the complete legal situation of land, including public rights and restrictions!

- increasing pressure on the resource "land" and changing humankind to land relationship, requiring the cadastral system to be flexible and to adapt to the changing needs;
- with European agricultural subsidy system depending on the land-use, there is a growing need to have reliable information about land-use rights and obligations attached to a specific land parcel;
- we need to know what we are allowed to do with the land that we own – as much as we need proof of our ownership.

(Dale, 2006)

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Evaluation – Statement 1

Cadastre 2014 will show the complete legal situation of land, including public rights and restrictions!

Example Switzerland (I)



Intermediate report by SIDIS working group:

- land market clearly in need of reliable information (considering the total value of real estate of over Euro 1,300 billion)
- maintenance of land information in form of register is not efficient, GIS technology offers interesting new possibilities by spatial overlay of independent information topics
- very difficult to estimate costs of organization

(see presentation by J.-P. Miserez)



Findings of a legal aspects study done by University of Bern:

- wealth of public-rights restrictions calls for an inventory and their geographic delimitation
- problems to solve: privacy issues, priorities in disputes, liability of register, maintenance of register by private sector

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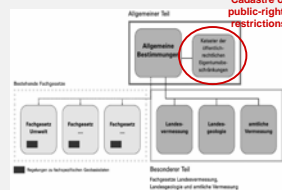


Evaluation – Statement 1

Cadastre 2014 will show the complete legal situation of land, including public rights and restrictions!

Example Switzerland (II)

Structure of new Law on Geoinformation:



Cadastre of public-rights restrictions

Estimated cost/benefit for cadastre of public-rights restrictions:

Systematic and public inventory of geographic objects that carry public restrictions (Jan. 2006):

Estimated costs: 0.6-2.7 million Euro to establish the data model and the legal basis on cantonal level / 54-215 million Euro for acquiring data for 10 most important restrictions.

Estimated benefits: 63 million Euro per year.

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Evaluation – Statement 1

Cadastre 2014 will show the complete legal situation of land, including public rights and restrictions!

Example Switzerland (III)



Initiative by private sector land surveyors:

- to establish an information service about all public rights and restrictions affecting private land ownership (land-use planning, zoning, environmental protection, heritage protection).

(see presentation by P. Dutschler)

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Evaluation – Statement 2

The separation between 'maps' and 'registers' will be abolished!

- over the last ten years, there was an increasing tendency that the cadastral and the land registry organization are being joined;
- a complete integration of the two organizations, however, is not necessary to achieve cooperation.
 - NL: the Dutch Kadaster provides an integrated service to their customers for more than ten years now;
 - DK: the cooperation and sharing of data is very much enforced for the purpose of providing efficient service to users and citizens;
 - N: the decentralized land registration services are being transferred to a new IT infrastructure at central level within the centrally organized Statens kartverk; although the cadastre and land register will be kept as separate databases, the user will enjoy an integrated one-stop access.

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Evaluation – Statement 3

'Cadastral mapping' will be dead! Long live modelling!

- over the last 4-5 years, data modelling came increasingly on the agenda of international discussions in the cadastral field;
- Initiative for a 'core cadastral data model' by Lemmen and van Oosterom serving at least two goals:
 - to avoid reinventing and re-implementing the same functionality over and over again, but provide an extensible basis for efficient and effective cadastral system development based on a model driven architecture;
 - to enable different stakeholders to communicate based on the shared ontology implied by the model, which is to be kept as transparent and simple as possible in order to be useful in practise.
- "Workshop on Cadastral Data Modelling" in Enschede, The Netherlands (March 2003)
- "Conference on Standardization in the Cadastral Domain" in Bamberg, Germany (December 2004)

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Evaluation – Statement 3

'Cadastral mapping' will be dead!
Long live modelling!

Example Switzerland

- Core cadastral data model: revised data model "DM.01" based on INTERLIS2
 - one clearly defined federal data model
 - hierarchy of data models (Cantons can add options to federal model, but have to provide data in federal model)
 - checking of data becomes much easier → introduction of check service on Internet
 - technical possibility of incremental updating (requires OID and INTERLIS2)



Evaluation – Statement 3

'Cadastral mapping' will be dead!
Long live modelling!

- Also the two definitions, given by Cadastre 2014 have become the issue of international attention.
- Fourie et al. (2001) observe that in the light of sustainable development and land management, a whole range of land objects, not only ownership parcels are part in a land information system, and that it is high time to start discussions on this issue.
- The other definition, the principle of legal independence, basically states that data and information from different sources can be integrated and shared independent from the different stakeholders by using a layered approach.

Evaluation – Statement 3

'Cadastral mapping' will be dead!
Long live modelling!

| Legal topic | spatial data | textual data | Stakeholders (data owners) |
|--------------------------|--------------|--------------|---|
| Water protection | | | Local government |
| Noise protection | | | Local government |
| Environmental protection | | | Environmental department |
| Land use planning | | | Planning department |
| Indigenous land rights | | | Tribe, clan |
| Collective land rights | | | Corporations |
| Land ownership, cadastre | | | National government State government Local government |

Two requirements: common geodetic reference framework
common data modelling concept

Two requirements:

Evaluation – Statement 4

'Paper and pencil cadastre' will be gone!

The digital age has come a long way and is in full swing. A digital cadastre is therefore not much in question anymore, although the context and the circumstances of course need to be carefully considered.

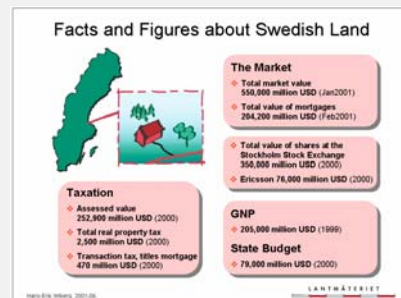
Evaluation – Statement 5

Cadastré 2014 will be highly privatized!
Public and private sector are working closely together!

- not a call for complete privatization !!
- but: the involvement of private sector – under supervision of public sector – is of great benefit to the whole cadastral system (→ innovation)
- on international level: PPP has very much come on the agenda of the international community

Evaluation – Statement 6

Cadastré 2014 will be cost recovering!



Conclusions

- Cadastre 2014 statements are valid for developed countries, developing countries may have different problems to solve in the beginning, Cadastre 2014 however still can serve as guidelines
- Cadastre is part of something bigger
 - "land administration" functions are serving the wider society
 - "geoinformation" serving government and private sector
- Cadastre has to open and be pro-active towards SDI and the wider geoinformation community in order to provide the services and products that are in demand
- Cadastre is an information system
 - an information system can only live up to expectations when information is: complete, reliable, efficient

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