Modern Cadastre and Land Administration

Session 4b. The cadastral concept and evolution

Jude Wallace
Overview

Objectives
- To understand the role of the cadastre in administration of a nation, its operation and components.

Topics
- The cadastral concept and the FIG Statement on the Cadastre
- Historical development of cadastres
- Components of a cadastre
- Cadastral issues
- Types of cadastres: Legal (Juridical) cadastres; Fiscal cadastres; Multi-purpose cadastres
- Cadastral models
- CADASTRE 2014

References
- UNECE, Land Administration Guidelines, Meeting of Land Administrators [go to Meeting of Officials on Land Administration]
An introduction to Cadastres
History of cadastres

- Egyptians 3000BC
- Italy 1600BC
- Roman Empire 300AD
- Doomsday Book (William the Conqueror) 1076
- Maria Theresia Cadastre (Austro-Hungarian Monarchy) 1792
- Napoleonic Cadastre 1807
Egyptian surveyors at work
Plan made about 1600 – 1400 BCE

Source: Land Registration and Cadastral Systems (Gerhard Larsson)
We need a land information policy

David J Cowen. 2006. Chair of National Research Council *Study on National Vision for Land Parcel Databases in US*
Features of modern cadastres

**Scientific**
- Modern cadastres are built according to scientific standards using rigorous surveying methods.
- Measurements and points are capable of being re-established by similar or better rigorous processes.

**People friendly**
- Cadastres allow people to interpret land information. They form the basis of land management. They reflect the way people actually use and think about their land.
Extract from Swedish cadastral map

Source: Land Registration and Cadastral Systems (Gerhard Larsson)
Land Administration Project - The Philippines

Centre for SDIs and Land Administration
Department of Geomatics
The basic building block in any land administration system is the cadastral parcel.

Cadastres consist of two parts – *registers* and *parcel maps*. 
The definition of cadastre

A cadastre is the core or basis of a land administration system and is a parcel based and up-to-date land information system containing a record of interests in land (e.g. rights, restrictions and responsibilities).

It usually includes a geometric description of land parcels linked to other records describing the nature of the interests, and ownership or control of those interests, and often the value of the parcel and its improvements (FIG, 1995).
The FIG Statement on the Cadastre highlights its importance as a land information system for social and economic development from an international perspective and recognises the central role that surveyors play in its establishment and maintenance.

The statement does not recommend a uniform cadastre for every country or jurisdiction, but gives a range of options for establishing and managing cadastres.
A successful Cadastre should provide security of tenure, be simple and clear, be accessible, and provide current and reliable information at low cost.
Other essential elements of a modern cadastre

- Dynamic
- Large scale maps
- Registers
- Complete – ALL LAND
- Correct and reliable
- Supported by a coordinated survey system
- Each parcel must have a unique identifier
- Unambiguously defines parcel boundaries both in map form and on the ground through cadastral surveys
- Publicly accessible
Today cadastres assist effective land management

- Effective land management requires land information about resource capacity, tenure and use.
- The cadastre is the primary means of organising land information.
- The cadastre is –
  - information identifying people who have interests in parcels
  - information about interests (e.g. nature and duration of rights, restrictions, and responsibilities)
  - information about parcels (e.g. their location, size, improvements, value)
  - In digital systems CORE SPATIALLY ENABLED INFORMATION.

- THE CADASTRE IS UNIQUE BECAUSE IT REPRESENTS THE WAY PEOPLE ACTUALLY USE THEIR LAND.
Different cadastre typologies
Functions of cadastres

1. Legal cadastre – supports land markets
2. Fiscal cadastre – supports land taxation
3. Multipurpose cadastre – supports all LAS processes
4. The cadastre as an engine of LAS – supports delivery of Sustainable Development
A modern multipurpose cadastre helps...

- sustainable development
- conveyancing system
- cadastral survey system
- land use planning, land management and environmental management
- management of publicly owned lands
- avoidance of duplication
- control of land transactions
- management of land dispute
- public confidence in LAS
A parcel based land information system

Source: Ian Williamson

Lawyers/Surveyors  Fiscal  Local Government  Utilities  Planning/Land Use

Linkage and Searching Mechanism

Digital Cadastral Data Base (DCDB)  Automated Land Titles System (ALTS)

Other core spatial data sets

National Geodetic Reference Framework

Cadastral Component

Spatial Component

Coordination mechanism for state-wide geographic information
Multipurpose cadastre components

- Resources records
- Other records
- Administrative records
- Tenure and value records
- Other parcel-related records
- Other Identifiers
- Other overlays
- Parcel id
- Data-exchange Conventions
- Cadastral boundary overlay
- Base maps
- Geodetic reference framework

Source: National Research Council 1980
The role of the cadastre in the accession of Central European Countries to the European Union

Source: Bogaerts et al., 2002
CADASTRE 2014

Translated into 19 languages
Commission 7, FIG (1994-98)

Promotes multipurpose cadastres which include all public and private rights
Now cadastres are central to Land Management Paradigm
Cadastral systems service all LAS processes

- Social Stability
- Economic Growth
- Efficient Land Markets
- Security of Tenure and Investments

Land Tenure
- Land Rights
- Legal Means

Land Value
- Valuation, Taxation
- Fiscal Means

Collateral and Tax Basis
- Financial Services
- Public Services

Land Use
- Planning Control
- Environmental Means

Land Development
- Resource Management
- Environmental Sustainability
Significance of the cadastre

Cadastral engines...

1. Multipurpose Cadastre (German style)

2. Title or deeds tenure style cadastres

3. Taxation driven cadastre (Latin/Spanish/French)

SDI
Mapping agencies and other data providers

Land management paradigm

Tenure
Value
Use
Development

Spatially enabled government

Incorporating:
Land policy
Spatially enabled LAS
Services to business and public
Country context

Parcels
Properties
Buildings
Roads

Integrated functions

Better decision making

- Economic
- Environmental
- Social
- Governance

Sustainable development

Sustainable development
Cadastral issues

- Documentation of informal or customary rights
- Land registration (deeds, title, combinations)
- Land titling (sporadic and systematic)
- Parcels and properties
- Boundaries (fixed, graphical, general etc)
- Impact of technology
- Using the cadastre to as an engine of sustainable development
Cadastral Template Project

Evaluates and benchmarks cadastral systems world wide.

Created by UN Resolution.

Shows how countries manage cadastral issues

www.cadastraltemplate.org
# Cadastral Country Profiles 2003

(based on the Cadastral Template 2003)

## Field Definitions

<table>
<thead>
<tr>
<th>Field Definitions</th>
<th>Data per Field:</th>
<th>Data per Country:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C - Cadastral System</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C1 - Purpose of Cadastral System</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C2 - Types of Cadastral Systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C3 - Cadastral Concept</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C4 - Content of Cadastral System</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D - Cadastral Mapping</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D1 - Cadastral Map</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D2 - Example of Cadastral Map</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D3 - Role of Cadastral Layer in SDI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E - Reform Issues</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E1 - Cadastral Issues</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cadastral Principles and Statistics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1 Cadastral Principles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.1 Population</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.3 Parcels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.7 Professionals</td>
<td></td>
</tr>
</tbody>
</table>

## Additional Document
## Field Definitions

### Data per Field:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Country Report</td>
<td>A - Country Context&lt;br&gt;A1 - Geographical Context&lt;br&gt;A2 - Historical Context&lt;br&gt;A3 - Current Political and Administrative Structures&lt;br&gt;A4 - Historical Outline of Cadastral System</td>
</tr>
<tr>
<td>D - Cadastral Mapping</td>
<td>D1 - Cadastral Map&lt;br&gt;D2 - Example of Cadastral Map&lt;br&gt;D3 - Role of Cadastral Layer in SDI</td>
</tr>
</tbody>
</table>

### Data per Country:

- Australia
- Denmark
- Germany
- Netherlands
- Switzerland
Fig. 1: Australian Capital Territory Digital Cadastral Database - survey accurate.
Australia’s cadastre in the digital age - Cadlite

A PSMA PRODUCT

Centre for SDIs and Land Administration
Department of Geomatics
Australia’s cadastre in the digital age -
Geocoded National Address File G-NAF

The G-NAF, or Geocoded National Address File has realised the creation and maintenance of a single authoritative Geocoded database of reference in Australia for street address data. Words such as “authoritative”, “fundamental” and “holy grail of address lists” have been used to describe G-NAF.

PSMA Australia has been collaborating with as many as 15 government agencies and organisations over several years to develop a methodology that would deliver a definitive and authoritative Geocoded National Address File (G-NAF) to Australia.

For institutions, national corporations and government agencies, G-NAF can provide a solution to the challenges and high costs associated with assembling and accurately maintaining large address files. It can also result in significant economic benefits to the Nation through:

- More effective delivery of goods and services at the individual consumer level;
- Elimination of duplication across a range of hybrid address databases;
- Implementation of a maintenance program for national address file;
- Improved access for all organisations requiring a national address file for their operations.

http://www.g-naf.com.au/about.htm
The cadastre will continue to evolve

Every nation will have its own story

Your questions?

Your comments?