The Cadastral "Tool Box" – A Framework for Reform

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Key words: Cadastre, land administration, tool box, implementation, land policy.

ABSTRACT

Cadastres are a core component of land administration systems and an important infrastructure which facilitates the implementation of land use policies. While most cadastral systems traditionally have a primary objective of supporting the operation of land markets, they increasingly play a key role in a broader land administration infrastructure which supports economic development, environmental management and social stability in both developed and developing countries.

In this context, this paper outlines the concept of a cadastral "tool box" which allows states or jurisdictions to undertake cadastral reform by selecting the most appropriate land policies, legal concepts, institutional arrangements and technical solutions. In this paper a reference to land administration is also a reference to the cadastre which is the central component of a land administration system.

In developing the cadastral "tool box", the paper reviews the three dimensions of a land administration system. Firstly the wide range of humankind to land relationships within any state or jurisdiction which require different cadastral strategies for each relationship. Secondly these humankind to land relationships and the resulting cadastral responses are dynamic and are continually evolving. Lastly countries are at different stages of development and as a result require different strategies and consequently different components from the cadastral "tool box" in order to serve their needs.

This paper focuses on the needs of the urban poor regarding access to land and security of tenure however the concepts are equally applicable to non urban areas.

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1. INTRODUCTION

There is a great amount of effort worldwide to understand the problems of shelter, access to land and security of tenure in developing countries, but much less attention to the *mechanics* of policy implementation. In other words there is little attention to the practical or "engineering" side of designing, building and managing cadastral and the broader land administration infrastructures which facilitate shelter, security of tenure and access to land – in other words "the other side of the coin".

In considering the mechanics of policy implementation, this paper reviews the dimensions of land administration, the concept of a cadastral "tool box", a holistic approach to developing land administration infrastructures in developing countries, and finally the critical component of capacity building.

For a more detailed investigation of this subject see the paper by the author titled "Land Administration Best Practice – providing the infrastructure for land policy implementation" (Williamson, 2001).

2. DIMENSIONS OF LAND ADMINISTRATION

There are three dimensions of land administration:

1. There is a wide range of humankind to land relationships which must be taken into account when designing land administration systems.

2. Each humankind to land relationship is dynamic and evolves, with the result that land administration systems have to take this into account and be able to accommodate this change.

3. Countries at different stages of development will use different tools and strategies depending on their level of development and capacity.

Humankind to land relationships are reflected in rights, restrictions and responsibilities, and can include:

- Formal and informal relationships
- Private, leasehold, common property and customary or traditional relationships
- Corporate relationships
- Public and state relationships.

These relationships appear in both the developed and developing world although to different degrees. For example, in the developed world where most of the relationships are formal, there is also a range of informal relationships such as homelessness, albeit to a lesser extent than developing countries. Also the percentage of rental accommodation compared to private ownership in the developed world varies greatly - in Germany 62%, across the European Union 44%, in the United States of America 33%, and in Japan 39%. At the same time there is a wide range of tools to manage the humankind to land relationships other than owning a separate land parcel with a house, such as strata titles, cluster titles and condominium titles. At the same time in many cities of the developed world, you find trailer parks or caravans parks on their outskirts, which in one sense could be considered the slums of the developed world. In the developed world, rental accommodation for itinerant workers occurs in all these categories. The developing world can learn from the experiences of the developed world in providing shelter and access to land, particularly for the urban poor.

The important point from this brief discussion is to recognize that the humankind to land relationship is complex and can occur in many forms in both the developed and developing worlds. Unfortunately there has been a preoccupation with the provision of full private rights in land administration projects and not a similar focus on alternative mechanisms to provide access to land, shelter and security of tenure. As a result, if land administration infrastructures are going to be developed to support security of tenure and access to land, then the full range of humankind to land relationships and the full range of land administration tools which are available, should be considered.

3. DYNAMIC HUMANKIND TO LAND RELATIONSHIP

The development of any land administration infrastructure must recognize that the humankind to land relationship is dynamic as shown in Figure 1 (Ting et al 1999).

This diagram strategically shows how periods such as the Industrial Revolution influenced the growth of cities and the establishment of land markets. It also highlights that in the last couple of decades of the 20th Century, environmental and social issues (indigenous and women's rights) have increasingly influenced the humankind to land relationship.

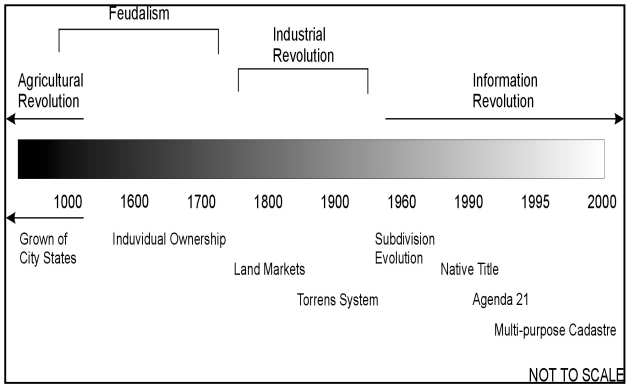

Figure 1
Changing humankind to land relationship

In understanding the impact of the change in humankind to land relationships, it is important to recognize the role of the cadastre in land administration as depicted by the cadastral concept shown in Figure 2 (FIG 1995).

In simple terms the cadastre is an inventory of land parcels which has a spatial or map-based dimension or component as well as a textual component showing ownership or other interests in land, with both components increasingly being integrated or drawn together in digital form.

It is also important to understand the role of spatial data infrastructures in land administration when addressing issues of security of tenure and access to land for the urban poor. A spatial data infrastructure is more than maps and is a hierarchical concept of infrastructures, which relies on dynamic intra- and inter-jurisdictional partnerships, which brings together geographic data, standards, access mechanisms, administrative structures and people (Figure 3).

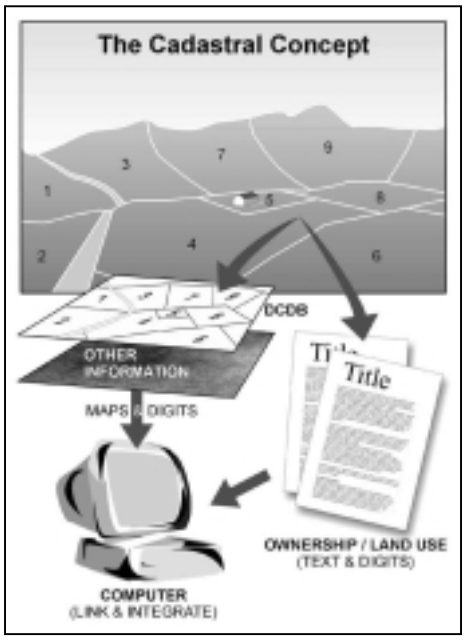

Figure 2
Cadastral Concept

The cadastral response to the changing humankind to land relationship is depicted simplistically in Figure 4 where it is shown that up to the 1700s, land equated to wealth, with a cadastre playing primarily a static, fiscal or juridical role. In the 18th and 19th Centuries and up to the mid 20th Century, as a result of the growth of cities and the Industrial Revolution, land started to become a commodity. As a result the cadastre had to accommodate a land transfer function. Post World War II saw an increasing recognition of land being a scarce resource with the requirement that the cadastre also supports a planning function as well as the former land transfer and fiscal function. In the last couple of decades land has been recognized as not only a scarce resource but a scarce community resource with environmental issues and broader social issues significantly tempering the economic paradigm which drove land administration in the past. As a result, modern day cadastres are increasingly having to accommodate a multi-purpose role as shown in Figure 4 (Ting and Williamson 1999).

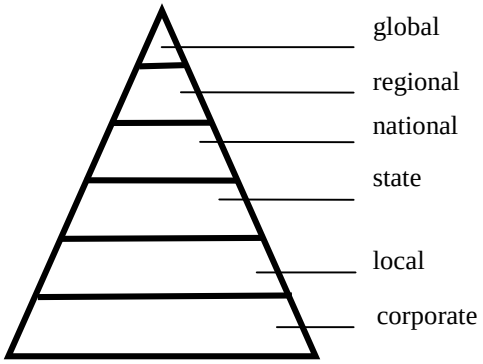

Figure 3. Hierarchy of SDIs

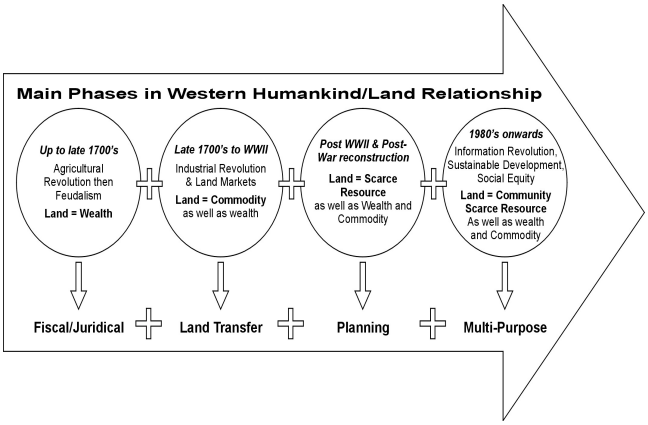

Figure 4

In summary, if land administration infrastructures are to be developed which

serve the needs of developing countries, then they need to accommodate the wide range and changing humankind to land relationships.

4. COUNTRIES AT DIFFERENT STAGES OF DEVELOPMENT IN ASIA AND THE PACIFIC

Countries at different stages of development have different priorities and different capacities to undertake land administration reform. Simplistically countries can be categories into:

- Developed
- Newly industrialized
- Early stage of development
- Pacific Island states

While many countries exhibit aspects from all these groups of countries, most countries typically fall into one of these categories. As such countries in the different groups will draw on a different range of tools from the cadastral "tool box" described below.

5. CADASTRAL "TOOL BOX"

Just as there is a wide range of evolving and dynamic humankind to land relationships in cities, there is a wide range of land administration tools or options in the cadastral "tool box". These include:

- Land policy options
- Legal options
- Land tenure options
- Land administration and cadastral options
- Institutional options
- Spatial data infrastructure options
- Technical options
- HRD or capacity building options.

The details of the options in the cadastral "tool box" can be seen in Williamson (2001)**.** However the important point from this discussion is that *there is a wide range of options which can address the different humankind to land relationships and the different land administration responses required by those relationships, and can also take into account the different needs of different countries at different stages of development.*

An important aspect of knowing which tools to apply from the tool box is knowing if you have a good cadastral system or not, or when your current cadastral system needs improving, or if you are undertaking major reforms, how do you know whether those reforms are effective. A key management tool in answering these questions is the benchmarking of land administration and cadastral systems, and utilizing performance indicators.

With regard to performance indicators, they generally fall into two categories:

– Examples of policy performance indicators
  - security of tenure
  - poverty reduction
  - increase in GNP
  - facilitation of sustainable development objectives

– Examples of operational performance indicators
  - parcels per one million population
  - boundary and title disputes
  - professionals per one million population
  - efficiency of land market (times and cost to subdivide, transfer and develop land)

Two examples of operational performance indicators are seen in Figures 5 and 6 which are taken from the paper “Benchmarking Cadastral Systems” (Steudler et al 1997).

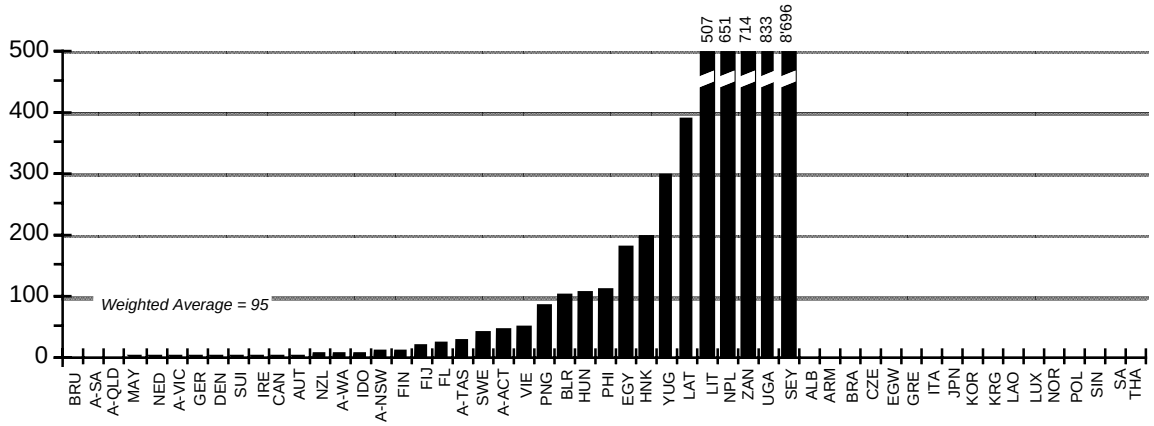

Figure 5
Title disputes per one million parcels

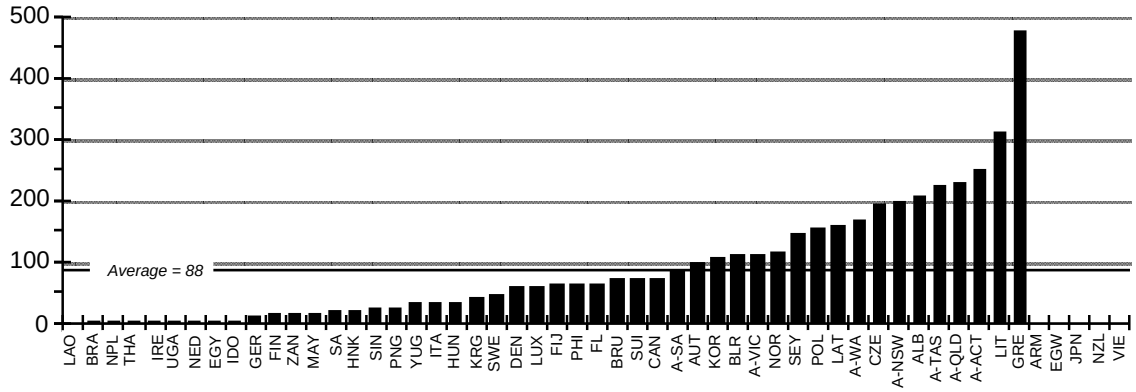

Figure 6
Professional surveyors per one million people

The key lesson to note from the discussion on the cadastral tool box is to remember that when strategies are being developed to address issues of access to land and security of tenure, there is a range of tools which can be utilised and there is a range of performance indicators which can be adopted to see whether the tools are effective or not.

6. A NATIONAL LAND ADMINISTRATION VISION AND STRATEGY

Strategies to provide security of tenure and access to land cannot be implemented or effective if they are done in isolation from a holistic or national land administration vision and strategy of which a cadastre is a central component. Experience shows that piecemeal or ad hoc land administration strategies are often ineffective.

Simply land administration infrastructures are national infrastructures. They are not just urban and they are not just rural. For example land administration infrastructures or land registration or cadastral surveying legislation for example, are typically national or at least state or provincial instruments. As a result the land administration infrastructure which is put in place for a state or nation should support all private, public, state and corporate rights, restrictions and responsibilities relating to land. The infrastructure should support different institutions, laws or technologies according to the individual needs of each humankind to land relationship.

This view has been supported by people such as Sylvie Lacroux from the United Nations Centre for Human Settlements (Habitat) who stated "… the failure of so many governments to develop equitable national land policies and practices has been identified as a primary cause of poverty, inequity and hence social instability in society" (UNCHS (Habitat) 2000). Further Omar Razzaz, who coordinates urban research at The World Bank highlights in his paper on urban reform strategies "Reforming Land and Real Estate Markets", the difficulties caused by "… the absence of a comprehensive approach or 'road map' to guide the design of reforms …"(Razzaz and Galal 2000).

Finally Frederic de Dinechin, a land administration specialist with The World Bank, emphasizes the need for spatial data infrastructures in developing countries in his paper titled "Spatial Data Infrastructures (SDI) - Fundamental to World Bank Land Administration Projects?" (Dinechin 2001). His paper emphasizes three key points for the importance of SDIs:

- SDIs are key for objective decision making and sound land based policy, since they give an objective knowledge of the location of an activity.

- SDIs support economic development, facilitating for instance an effective parcel based land market.

- SDIs encourage socially and environmentally sustainable development through a comprehensive approach within a state or country, including urban/rural land, private/public land, natural resources and indigenous territories.

7. BUILDING APPROPRIATE LAND ADMINISTRATION INFRASTRUCTURES

After taking all the issues discussed previously in this paper into account in designing an appropriate land administration system for a country, a management approach is required as shown in Figure 7 (Williamson and Ting 2001).

That is the system which is designed has to recognize that the changing humankind to land relationship influences and results in different land administration policies which consequently require different land administration systems. These land administration systems then require specific spatial business systems to operate (ie a land registry or cadastral surveying function) which in turn build on spatial data infrastructures. At the same time technology impacts across all these levels.

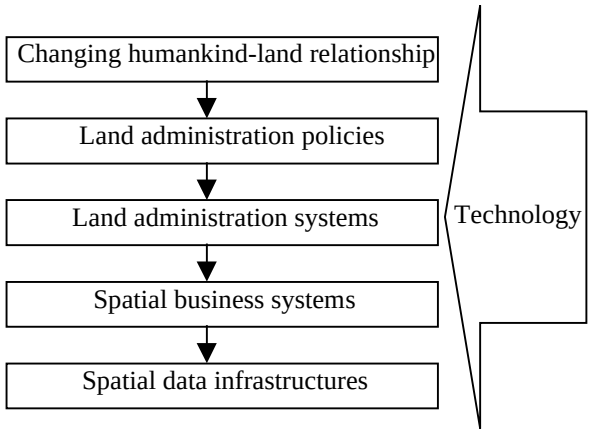

Figure 7. Developing spatial information management strategies

The important lesson from this hierarchy is that it must be the humankind to land relationships which drive the design of the land administration systems and the resulting spatial data infrastructures which underpin them. Unfortunately technocrats (including lawyers, land administrators and surveyors) often reverse this order and put in place either technical or legal infrastructures without determining the needs of the humankind to land relationship. The actual land administration infrastructure is then developed or an existing system is usually re-engineered as shown in Figure 8 (Williamson and Ting 2001).

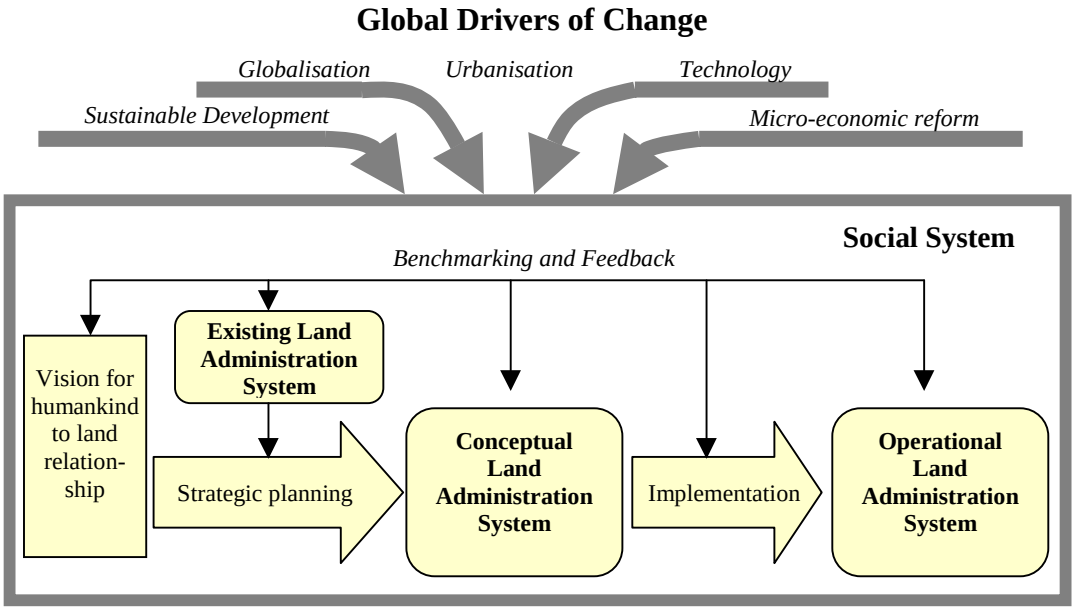

Figure 8
Re-engineering land administration systems

This figure recognizes the impact that global drivers have on the social system which supports the different humankind to land relationships and the resulting cadastral and land administration systems. It recognizes the need to have a vision for future humankind to land relationships which accommodates existing cadastra and land administration systems. This results in the development of an ideal or conceptual system, which after implementation, results in a less ideal or operational system, which again as a result of feedback and benchmarking, is refined over the years.

8. CAPACITY BUILDING AND HUMAN RESOURCE DEVELOPMENT

There are two key aspects in building or re-engineering land administration systems: first the establishment of the appropriate land administration system itself; and secondly ensuring that there is sustainable long-term capacity of educated and trained personnel to operate the system in both the public and private sectors. All human resource development and capacity building principles are central to these objectives. In many countries this is the weakest link in implementing appropriate systems to provide security of tenure and access.

Where a project is established to create land administration infrastructures, often with the support of organizations such as The World Bank, the United Nations or individual country aid agencies, it is critical that capacity building is a mainstream component of the project, not an add-on. Also capacity building is equally applicable to the private sector and the establishment of professions, as it is to the public sector. In this context there is a whole range of capacity building and HRD principles and options within the cadastral tool box. The reality is that worldwide there are law schools, planning schools, surveying schools, policy

think-tanks and policy units – but where is the practical education, training and research being done to support cadastral or land administration implementation?

One strategy is the establishment of a Land Administration Education and Research Centre as part of national land titling or land administration projects. Such a Centre could be established along the following lines:

- In-country and part of a major project (s)
- Focus on private, public, common property, customary, state and corporate tenures
- Build a body of knowledge which is country or region specific
- Maintain an on-going resource of all reports, research and consultancies relating to the project and topic
- Provide graduate level education and research, and advice to government and the projects
- Build capacity of local academics

9. CONCLUSION

If access to land and security of tenure are to be a reality, there must be recognition that there is a variety of related humankind to land relationships which are dynamic and evolve over time. As a result, a land administration infrastructure has to be developed which can accommodate these different humankind to land relationships by drawing on the options within the cadastral "tool box".

Importantly the strategies to address issues of access to land and security of tenure should be done in the context of a national land administration vision and strategy, which incorporates a national spatial data infrastructure.

Finally the development of appropriate land administration infrastructures must focus on appropriate international and local capacity for implementing these land policies if there is to be any chance of success in addressing the needs of the urban poor.

So let's not just talk policy, but also look at the other side of the coin, which is practical implementation.

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BIOGRAPHICAL NOTES

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He has undertaken research and consultancies worldwide including for Australian governments, AusAID, many individual country governments, the United Nations and the World Bank. He was Chairperson of Commission 7 (Cadastre and Land Management) of the International Federation of Surveyors 1994-98, and is currently Director, FIG/UN Liaison 1998-2002. He is an Honorary Member of the FIG. At the University of Melbourne he has been President of the Academic Board and Pro-Vice-Chancellor. He is currently Chairperson of the Victorian Government's Geospatial Information Reference Group and Chairperson of Working Group 3 (Cadastre) of the United Nations sponsored Permanent Committee for GIS Infrastructure for Asia and the Pacific (2001-2004).