Contents Page

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APPROPRIATE CADASTRAL SYSTEMS

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Introduction

This paper discusses the role of cadastres in developing countries, reviews why cadastral systems have become much more important in the eyes of policy makers over the last ten years, particularly in the developing world, and finally highlights some important lessons arising from establishing cadastral systems in developing countries over the past decade.

The role of cadastres

In examining cadastral systems it is more important to examine the key processes within the systems which are associated with adjudicating, transferring and sub-dividing land rights, rather than looking at a free standing concept of a cadastre. It is important to recognise the flexibility of cadastres in that they can record a continuum of land tenure arrangements from private and individual land rights through to communal land rights, as well as having the ability to accommodate traditional or customary land rights.

It is also important to remember that cadastral systems are not ends in themselves and often support effective land markets, increased agricultural productivity, sustainable economic development, environmental management, political stability and social justice, although it is absolutely essential that each cadastral system is designed appropriately to serve the needs of the respective country.

There is a vast array of legal, technical, administrative and institutional options available in designing and establishing an appropriate cadastral system, again providing a continuum of forms of cadastre ranging from the very simple to the very sophisticated. Cadastral systems designed for poorer countries should be

simple, flexible, freely accessible and low cost, and often have similarities with the operation of their informal land markets, while the cadastral systems found in most of the developed countries are usually complex, more rigid, expensive, relatively slow and have a high level of technical sophistication. The success of a cadastral system, however, is not dependent on its legal or technical sophistication, but whether it protects land rights adequately and permits those rights to be traded (where appropriate) efficiently, simply, quickly, securely and at low cost. However if the resources or systems are not available to keep the cadastral system up-to-date then there is little justification for its establishment.

Increase in interest in cadastral systems

There has been a dramatic increase in interest and activity in the establishment and improvement of cadastral systems over the past decade or so, which has become very evident over the last five years, for the following reasons:

- a resurgence of interest in land tenure, land titling, cadastral and land administration systems about ten years ago in the international organisations, such as the World Bank and the United Nations, as well as in individual country aid agencies, as part of the general trend for such organisations to increasingly move their focus to address national institutional and infrastructure issues. This move was supported by the increasing recognition that land tenure was a major constraint in projects undertaken by these organisations. Increasingly land matters have become a regular component of sector work and structural adjustment operations supported by the World Bank. Hence a new generation of land titling and land administration projects have commenced as a result of an improved willingness of the lending agencies and borrower countries to fund such projects.
- influential publications and articles have increasingly promoted the importance of cadastral systems and land titling programs over the last decade. For example recent editions of the World Development Report published by The World Bank have recognised the importance of regularising land rights in support of poverty alleviation, promoting sustainable development, environmental management and improving financial systems.
- a recognition at the 1992 United Nations Conference on Environment and Development (UNCED) or "Earth Summit" of the importance of cadastral, land and geographic information systems to environmental management and sustainable development.
- cadastral and land information systems are increasingly being seen as basic infrastructure supporting sustainable economic development and environmental management, especially in developed countries.
- over the last decade or so the economic and social benefits of cadastral systems and land titling projects have been increasingly quantified. At the same time the major international organisations have built up their experience and expertise in the area, thereby providing further support for such initiatives.
- the growth in information technologies which have specific application to

the automation of cadastral records, and the associated growth of interest in related land and geographic information systems, has given cadastral and related projects a higher profile and priority due to the benefits to be derived from the new information environment.

- the last decade has seen a dramatic growth in enabling technologies which have the ability of improving the efficiency and speed, and reducing the cost of establishing and maintaining cadastral systems. Some examples include satellite position fixing (GPS), digital theodolites, computing and advances in photogrammetric mapping.
- since the 1980s there has been a growing interest and understanding from researchers about cadastral and land information systems with the result that there is now a substantial body of knowledge on the subject. In addition there are now many conferences, workshops, professional activities, research papers, reports, books, newsletters and journals providing information in support of cadastral reform and related activities.
- the dramatic changes in Eastern and Central Europe, with moves from command to market driven economies, have resulted in urgent demands by those countries for cadastral or land registration systems to support effective land markets which in turn support their economic development. These demands have raised the awareness of the importance of cadastral and land information systems world wide.
- the importance of cadastral systems, and more recently land and geographic information systems, to economic growth, environmental management and social and political stability has been equally recognised and promoted by both rural and urban sectors, thereby supporting and making possible national cadastral reform programs.

Some lessons

The important lessons that have been learnt from investigating land issues and establishing and maintaining cadastral systems over the past decade, include:

- efficiency ultimately requires formal recognition of individual land rights and the establishment of cadastral systems, where population densities cause land to be scarce, as farming becomes more commercialised, as farming technologies improve and due to the emergence of land markets.
- the design of cadastral systems must be appropriate, systematic, sustainable and sensitive to the culture, needs, resources and level of development of individual countries. They should be designed for the needs of the land holders, not a central government bureaucracy. They should also be decentralised to the local or village level. They should be designed as processes associated with adjudicating, transferring and sub-dividing land rights, not stand alone entities such as land registries or cadastral surveying and mapping systems. Unfortunately many donors and policy makers have preconceived notions of the ideal cadastral system which sometimes results in the establishment of inappropriate systems.
- the necessity and importance of an appropriate base map for the cadastral system which can also be used for many other purposes. It is essential that the base map is made freely available. However the cadastral system must

be designed with the land registers having equal importance to the cadastral map. Simply the registers and the map can be considered "two sides of a coin" and as such cannot be separated and should be treated as one system.
- cadastral systems must be kept up-to-date otherwise there is little justification for their establishment.
- the appropriate use of new and enabling technologies to support the establishment and maintenance of cadastral systems, noting that while the use of computers, for example, may speed up some activities, such as the creation and maintenance of cadastral indexes, it may also slow down others, such as the creation of a base map if there is a desire to have the map fully computerised as part of a geographic information system, unless the country has an established information technology environment within government, has well trained professional staff to operate the systems and has access to local hardware and software maintenance, and system expertise. It must be remembered that effecive and efficient land markets based on modern cadastral systems do not require computerised cadastral maps. The justification for computerised cadastral maps comes from the multi-purpose use of those maps.
- cadastral systems should be designed with a national focus, but should be sufficiently flexible to accommodate both urban and rural requirements.
- cadastral systems are not ends in themselves and are a tool designed to support a variety of purposes which usually includes the operation of efficient and effective land markets.

Conclusion

The objective of this paper is to gain acceptance that many, if not most, developing countries or countries in transition are wishing to introduce some form of regularisation of land rights, which in turn requires the establishment of some form of cadastral system. As a result debate about cadastres should move from "whether they are desirable" to "what is the most appropriate cadastral system to serve the needs of an individual country or jurisdiction." This debate should recognise that no two cadastres will be the same due to the different geographic sensitivities and needs of each respective country. However it is important to recognise that cadastral systems must be appropriate to the circumstances and needs of the country for which they are designed, otherwise the cadastral system can do more harm than good!

In understanding cadastral issues, further work needs to be done to develop a topology or toolbox for cadastral systems and to determine the different stakeholders and users of cadastres, the different elements within cadastres and the range of options for each element, whether these are legal, technical, institutional or administrative, both now and in the future. In addition work needs to be done to determine what are the essential or core elements of a cadastre and to determine the minimum requirements of those elements for a range of different environmental, legal, economic and social situations.

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