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IAN WILLIAMSON

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**LAND REGISTRATION, CADASTRE AND ITS INTERACTION A WORLD
PERSPECTIVE**

REGISTRATION DES BODENS, KATASTER UND DEREN INTERAKTION ERNE
WELTPERSPEKTIVE

REGISTRE FONCIER, CADASTRE ET L'INTERACTION UNE
PERSPECTIVE MONDIALE

J.L.G. HENSSEN (NL)
I.P. WILLIAMSON (AU)

SUMMARY

In order to submit a world perspective, first of all the problems of population and economic growth and the role of the government are discussed. After definitions are given on the meaning of some expressions as used in this paper, the role of land records in a society are explained. Aspects of land tenure, land registration and cadastre are then further elaborated along with developments in this field of interests. Finally attention is paid to automation and data protection.

ZUSAMMENFASSUNG

Um eine weltperspektive bieten zu können werden zuerst die Probleme in Zusammenhang mit Bevölkerungszuwachs und wirtschaftliches Wachstum besprochen. Nachdem definiert worden ist was in diesem Bericht unter einigen Ausdrücken zu verstehen ist, wird die Rolle der Registrierung des Bodens in einer Gesellschaft erklärt. Aspekte der auf dem Boden auszuübenden Rechte, Registrierung des Bodens und Kataster werden dann weiter erörtert, zusammen mit den Entwicklungen auf diesem Fachgebiet. Zuletzt wird der Automation und dem Datenschutz Aufmerksamkeit geschenkt.

RESUME

Enfin de pouvoir donner une perspective mondiale, d'abord les problèmes de l'agrandissement de la population et de l'économie sont discutés. Après définition de la signification de quelques expressions dans ce rapport, le rôle du registre foncier et du cadastre dans la société est expliqué. Des aspects du système des droits fonciers, registration de terre et cadastre ainsi que les développements en ce domaine, sont traités plus profondément. Enfin l'attention est appelée sur l'automatisation et la protection des données.

INTRODUCTION

In discussing "developing countries" in this paper, reference is made to countries which are in great poverty in comparison to so-called developed, industrialized countries. This poverty is expressed in a lack of good nutrition, housing, health, education, employment, capital and political stability.

For such classification of a country and for monitoring possible results of policies a "development index" has been introduced. This index depends on the Gross National Product (GNP) per inhabitant and per year and is based on several facts like energy expenditures, export of industrial products per inhabitant the amount of highly educated inhabitants, the average life expectation and the Number of children attending school and the level they achieve.

Even though during the last few decades we have made a distinction between "developing countries" and "developed countries", this does not suggest that the so-called "developed" countries are not continuing to develop. It means that the so-called "developing" countries have a (much) longer way to go to reach a level of development comparable to "developed" countries.

For this reason most of the aspects discussed in this paper will be more or less valid for any country in the world, but depending on the level of development some of them may be more relevant or interesting to certain countries.

Besides, in spite of the importance to be discussed, developed countries do not necessarily manage a land recording system. In this field of interest development has still to be done in order to be able to cope with problems which will occur in the (near) future in some industrialized countries. This should, however not lead to the conclusion that for developing countries land recording systems are not (yet) necessary: developing countries should not copy mistakes of developed countries.

Land is the location of almost all human activities and is increasingly recognized as one of the most important elements in economic and social development.

What people are doing with the land depends on the quantity and quality of land, the density of the population, the level of development and the needs of the people. How they handle the land is related to factors such as history, climate, religious beliefs and influence of other nations.

II. PROBLEMS OF POPULATION AND ECONOMIC OF THE GROWTH, AND THE ROLE GOVERNMENT

A) GENERAL

Governments, especially in developing countries, are today facing a magnitude of problems which are related to the enormous growth of their population.

A considerable number of these problems are related to land, e.g. land tenure. In the following these problems are elaborated and their relationship is shown with respect to broad administration issues.

B POPULATION GROWTH

Although adequate shelter has been recognized as a basic human right for 25 years, the pitiful conditions in which more than one billion people live is of major concern and alarm. In order to give an impression of the magnitude of the problem consider the following:

- one of every four people in the world does not have adequate shelter and lives in extremely unsanitary and unhealthy conditions;
- about 100 million people do not have any shelter at all;
- it is estimated that in Latin America alone 20 million children and young people live and sleep in the streets;
- in the past 24 hours, more than 50,000 people, most of them children, have died from malnutrition and disease, much of it linked to inadequate shelter and infrastructure such as water supply and sanitation;
- in squatter settlements it is not uncommon that more than 1000 people depend on water from a single standpipe, while up to 90% of the inhabitants may have no access to human waste disposal facilities.

Concerning the growth of the world population, its needs and consequences, the reality is as follows: referring to a U.N.- report (1985) the world population is now estimated to be 5.1 billion. In the year 2000 it is estimated to be 6.1 billion and in 2025 to be 8.2 billion. Each year an increase of about 1.9% or 85 millions of people is expected, which is 160 persons per minute and 230,000 per day (see diagram 1 and 2).

At the time of Napoleon the world population was estimated to be about 1/5 of the present, about one billion. This was the estimated population of the world at the time when in West (Continental) Europe the concept of a country covering land registration and cadastral system was more or less accepted.

Upto the year 2000, cities and towns will contain half of the total world population. In 2025, 5.1 billions of people will live in towns and 3 billion in the rural areas. About 90% of the growth of the world population occurs in developing countries. In the future more than half of the world population will live in such countries, in and around large cities, in which the urban population will increase much faster than in the rural areas. The major growth in urban areas is caused by natural growth and by migration from rural areas. Thus around the turn of the century, out of 15 cities in the world with more than 12 millions of inhabitants, 13 will be in developing countries.

WORLD POPULATION

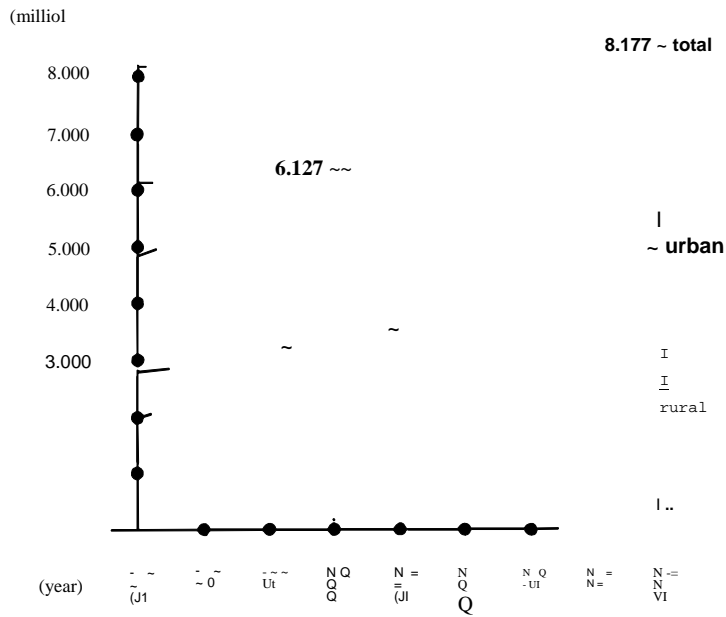
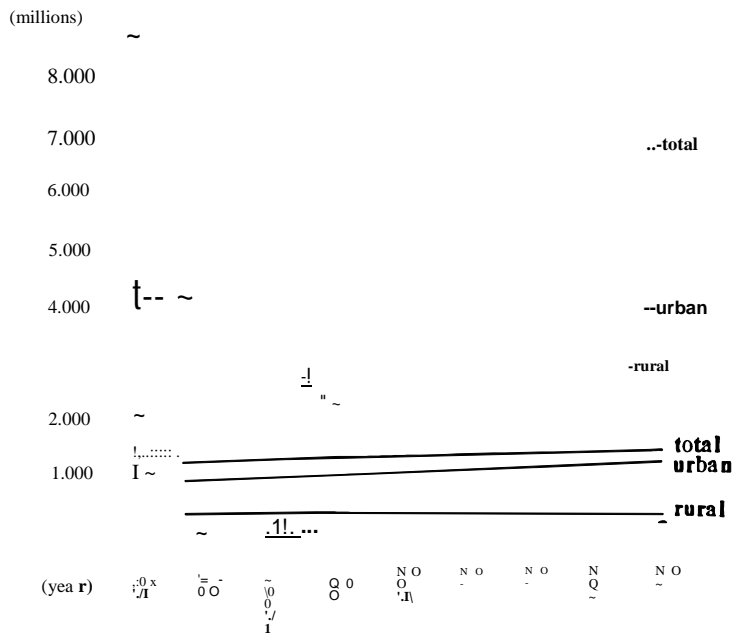


Diagram 1

POPULATION LESS DEVELOPED COUNTRIES VS. MORE DEVELOPED COUNTRIES



less developed countries
more developed countries

Diagram 2

Considering the foregoing it must be realized that in the beginning of the next century twice as many people have to be fed. At least a doubling of existing houses, transport facilities, schools, hospitals, factories etc. will be necessary. This requires an innovative urban and rural development policy, in which land registration and cadastre will play an important role as a tool, together with the tools of financing, legislation and regional and urban planning as well as education, training and research. This requires an adequate planning and attentive monitoring of rapid changes.

It is not hard to imagine what will happen if the world fails to address the problem, as already millions of people are homeless and suffer and die from malnutrition.

C ECONOMIC GROWTH

Especially in developing countries, the agricultural sector was without any doubt the most important one. The most visible contrast in economic structure between developed and developing countries was the dominance of the agricultural sector in the latter. It seemed an obvious conclusion therefore that economic progress requires fast expansion of the non-agricultural industry. As a consequence many former development plans were based on this premise. But experience has taught that industrialization and agricultural development are not interchangeable alternatives: increasing agricultural productivity, including a marketable surplus of agricultural products, is an important condition for other sectors to be able to expand. Nowadays we observe that in some developing countries a large part of the national income is produced by the sectors of industries and services.

It can be observed that in case of industrialization the protection and care of nature has not been given the necessary attention. In the past few years the effects of this have become more evident in combination with economic stagnation and recession. They relate to damage to the environment or, in other words, to the basic elements of all life: the soil, the air and the water as well as the wasteful exploitation of natural resources.

More and more it is becoming clear that every technological process causes various and complex dependencies which, in our limited area, more and more influence or even paralyse each other. As such no process exists separately but is variously connected with other processes and developments.

As will be explained in the next paragraph, government needs to be closely involved in all these developments and processes.

D) GOVERNMENTAL INVOLVEMENT

Government, as the guardian of the social and community interests, is closely involved in the above-mentioned processes and developments regarding the protection of nature, the quality of life and the progress in prosperity of the countries.

It is self-evident that the management and administration of land plays an important and central role in all these issues.

It is the task of government to address the above issues in policies, taking into consideration the complex inter-relationships.

In order to execute these policies, government has a number of tools or options at its disposal such as financing, legislative, planning, educational, research and organization policies. Nowadays government has a new tool at its disposal when executing its necessarily complex policies, namely information supply. Information supply should be regarded in relation to other tools, as it contributes to solving specific problems by means of other tools. It is a means to an end and not an end in itself.

In the broad field of information supply, the system of land recording has an important place. (The importance of this system should, however, be seen in the light of other tools and the general situation, as will be discussed later.)

After these introductory remarks it would be useful to discuss the definitions of some concepts and to outline the role which land recording plays for both the individual and government.

III. DEFINITIONS

A LAND

Land is a word with many meanings. It suggests different things to different people, depending upon their outlook and their interests at a particular point in time. To the economist, for instance, it is a resource to achieve economic production and development. To the lawyer it is a volume of space from the centre of the earth to the infinite sky with a variety of rights for determining many objectives (carrot theory). To many it is simply the space for human activity as reflected in the many forms of land use.

In this paper, following mainly the U.N. Ad Hoc group of Experts on Cadastral Surveying and Land Information (1985), land is defined as an area of the surface of the earth together with the water, soil, rocks, minerals and hydrocarbons beneath or upon it and the air above it. It embraces all things which are related to a fixed area or point of the surface of the earth, including the areas covered by water, so including the sea.

Since the United Nations Convention of the Law of the Sea of 1982, the sea has become more important in the area of marine resources management. The convention vests, among other things, sovereignty and stewardship in the coastal states of a zone 12 miles out to the sea (territorial sea) and an offshore economic exclusive zone extending 200 miles out to sea.

Land in relation to land registration and cadastre, and in general to land information systems to which category land registration and cadastre belong, concerns not only physical, spatial or topographic attributes (location, dimensions, area, use) but also abstract or thematic aspects (legal situation, value, tax data).

B LAND REGISTRATION

Land registration is a process of official recording of rights in land through deeds or as title (on properties). It means that there is an official record (the land register) of rights on land or of deeds concerning changes in the legal situation of defined units of land. It gives an answer to the questions "who" and "how".

C CADASTRE

Cadastre is a methodically arranged public inventory of data concerning properties within a certain country or district, based on a survey of their boundaries. Such properties are systematically identified by means of some separate designation. The outlines or boundaries of the property and the parcel identifier are normally shown on large-scale maps which, together with registers, may show for each separate property the nature, size, value and legal rights associated with the parcel. It gives an answer to the questions "where" and "how much".

D) LAND RECORDING

Land registration and cadastre usually complement each other; they operate as interactive systems. Land registration puts in principle the accent on the relation subject-right, whereas cadastre puts the accent on the relation right-object. In other words: the land registration answers the questions as to who and how, the cadastre answers the questions as to where and how much.

Because land registration and cadastre ("who and how" along with "where and how much") complement each other, the terms "land recording" or "land records" are usually used to indicate these two components together as a whole. Often the term "land titling" is used instead of the term "land recording".

E REMARKS

1. From the foregoing and from experience it can be concluded that an adequate land recording system (being a land registration system and a cadastre) consists of two basic parts, viz.:
 - a. a descriptive part containing registers or files which record legal facts (deeds) or legal consequences (tit-

les) and other physical or abstract attributes concerning the parcels depicted on the maps described below;

- b. a cartographic part, consisting of (large scale) maps, based on a survey, which contain the division into parcels of an area and with appropriate parcel identifiers.
2. It should be kept in mind that sometimes, depending often on the author's discipline (e.g. lawyer, land surveyor or layman) and country of origin:
 - a. the words land registration and cadastre are also used to indicate the organizational unit, which operates in the concerned field of recording;
 - b. the word land registration concerns only the system of registration of title (English influence);
 - c. land registration covers also the cadastral system;
 - d. cadastre includes also land registration (e.g. in "legal cadastre" or "multipurpose cadastre")

After having defined the concepts to be used in the paper, the role of land records both for the individual and society are discussed.

IV. THE ROLE OF LAND RECORDS (LAND REGISTRATION AND CADASTRE)

A GENERAL

Before discussing the role of land recording it should be stated that for policy makers in developing countries, and often also in developed countries, establishment and maintenance of a land recording system is not always a high priority activity. The concern on the part of these decision-makers can be traced back to a number of factors of a financial, economic and political nature. The costs of setting up such a system are usually considered to be high, while it generally does not produce any immediate tangible and quantifiable results. Such results or benefits manifest themselves usually in the longer term.

Besides, the capital at their disposal is generally invested by preference in projects of which the policy-makers can still see the results during their term of office. A land recording system is not a visible symbol of development like a prestige project such as an airport or a six track highway, an irrigation or land reform project.

Moreover the experience and technology associated with land recording is often not available to a young country. Experts capable of establishing such systems are few in number or absent altogether.

To convince the decision-makers, not only in developing but also in developed countries, the foregoing negative points must be eliminated by presenting advantages or benefits of such a system. It should be pointed out that the advantages are related to the social, political, religious, legal, financial and geographical situation of the country concerned.

B ADVANTAGES OR BENEFITS

The advantages or benefits of having a land recording system can be related to the individual or citizen on the one hand and government or society on the other.

To the individual or citizen: .

1. Legal security with respect to the legal situation of the properties are increased, both for the rightful claimants and for third parties; the increased legal security will result in a greater willingness of an owner/tenant to invest more money and labour in the land or property and to invest more in the longer term.
2. The funds necessary for these investments can, again as a consequence of the increased legal security, be borrowed easier: a cheaper longterm credit (e.g. mortgage) system can be developed. The availability of long-term credit by using titled land as a security leads in urban areas to increased land development and an improved land market. In rural areas it promotes long-term farm planning, better cropping patterns, longterm crops and soil conservation practices. Besides it enables the farmer to buy efficiency improving equipment and invest in farm improvement pro- grams. The consequences of such a credit system based on land recording are thus in principle a significant increase in productivity, an increase in revenues or income and an increase in value of the land.
3. Dealings in land become easier, cheaper, faster and safer. Consequently access to land is improved. Conveyancing of unregistered land is often expensive, unsafe and takes a long time.
4. Increased legal security will result in a decrease of title and boundary disputes and related litigations, which saves costs for both government and citizen and promotes good re- lations between neighbours. At present in many developing countries, after a transaction in land, a purchaser does not know exactly whether a piece of land or a lawsuit has been bought.

These benefits result in improvements to the economy and hence lead to increased productivity (see diagram 3 from Feder, The World Bank) .Because of a lack of quantitative information to indicate the magnitude of these benefits, it is necessary to quantify the benefits. Then it will be easier for government, faced with many competing claims for public resources for in- vestment, to decide to invest in land recording activities if it is demonstrated that the resulting benefits are higher than those of other public investments.

An example of such quantification is in rural areas of some provinces in Thailand where an economic analyse has been made by World Bank experts which provided a quantitative estimation of the socio-economic impact of land recording or titling. The result is that the value of titled land was, depending on loc-

al circumstances, considerably higher, and sometimes even more than twice the value of comparable untitled land.

This research points in the same direction as some former studies which concluded that in the State of Maranhão (Brazil), granting titled ownership to squatters doubled their income. In Ecuador it was found that the income of titled farmers was twice the income of untitled farmers while in Jamaica it was also almost twice.

ADVANTAGES TO INDIVIDUAL



Diagram 3 (idea derived from Gershon Feder,

The World Bank

These quantitative economic analyses strongly suggest that land recording or land titling gives positive costs-benefits, however there are considerable social benefits which also come from the process.

Of course the reliability of the quantitative information depends on the applied methodology of the economic analyses, which can be different from country to country or region to region.

Nowadays, with the scarcity of money and resources, it can be

expected that governments ask more and more for quantitative analyses or, in other words, for costbenefit analyses. Of course in these analyses the following benefits for government itself also play a role.

To the government or society:

1. A land recording system enables the government to establish an efficient and equitable system for justified levying of land- or property tax. This tax, based on realistic value, needs information on location, size and ownership or stewardship of the land or property.

This tax is, as a non-oil revenue, often the main source of governmental income, especially in urban areas. Simply if you do not know where land is, who works it and its value, it is difficult, if not impossible, to tax it. Besides, in relation to land management policy it can offer an incentive to place unused or underdeveloped land on the market by taxing this highly; thus speculation can be avoided.

2. For activities concerned with the development of land in case of land reform, land consolidation or land readjustment, the data of the land recording system constitute a necessary mechanism on behalf of the desired situation. These activities give information on the present land use, the determination of the optimal future land use, the implementation of that future land use and the management of the implemented use.
3. For the government, a mechanism becomes available to control whether transactions meet the requirements of planning, spatial management, the allowed maximum of land per owner (land ceiling), maximum sales price or the restrictions of land ownership by aliens. A country covering recording system makes it possible for government to determine the amount of private, communal and State land. For some countries this possibility is already a sufficient justification for the establishment of a land recording system.
4. Also on behalf of the execution of a multitude of other governmental tasks a useful tool is created. For example valuation on behalf of several activities, statistics of buildings, corporations, population, elections, foodproduction and distribution. This is the multipurpose cadastre concept. In this relation it should be stressed that there is a tendency to make the land recording system offer services to a proper governmental management of the environment, the challenge of at least the Eighties and Nineties.
5. The collected basic data of the cadastral map can also serve as basis for other necessary large scale maps, which will in the longer term result in a considerable saving of time and costs.
6. A parcel based land recording system, including the cadastral maps, can be the basis for the concept of an extensive land information system. So for instance the parcel identifier can serve as key for the integration and coupling of several kinds of land data. In that case the system functions as a multipurpose cadastre.

7. A large part of the mentioned advantages are in fact savings of costs for the government in the longer term. These savings of costs become even more interesting if one realizes that the costs, especially of the maintenance of the land recording, could be recovered by fees, i.e. for issuing certificates and for recording transfers.
8. The introduction of such a system offers the opportunity to eliminate undesired elements in the system of rights on the land smoothly, especially in areas with customary land tenure.
9. Land recording or land titling is also an opportunity for a government to show the whole population, and especially people in poor rural areas, that the government is prepared to do something positive for the populace.

C OBJECTIONS OR OPPOSITION

The following objections or opposition are often mentioned (explicitly expressed or otherwise made felt):

1. It is sometimes feared that registration of the land might lead to abolition of customary land tenure, applicable in a given area or for a given tribe, clan or family. In this connection it should be pointed out that, as already mentioned before with the advantages, land registration records in principle the existing situation, so it does not make any change in the legal situation based on customary land tenure. The introduction of land recording does present, however, an opportunity to eliminate smoothly any undesirable elements that might be associated with the rights and rules of law originating from customary law. Land registration or land recording is not land reform.
2. In many developing countries certain tribes, clans and families regard land recording as excessive government interference in the sphere of private life and in the family or tribal ties with the land.
In many African areas, for instance, preservation of the land held in ownership for posterity is a duty, actually based on religious principles, for the whole of the tribe or for the individual members of the tribe. It is feared that land recording would make it possible for the State to infringe these rights sooner or later.
3. An objection not expressly uttered, but nevertheless noticeable, sometimes originates from influential citizens or families in their capacity as large landowners or landlords. They sometimes, together, own 90% or more of the total area of the country. Seeing that this situation is made visible to the ordinary citizen through the medium of land recording this might well lead to political unrest in the country.
4. Sometimes opposition or obstruction against the introduction of land recording comes from those who earn their money from the lack of such a system (title insurance companies, solicitors, lawyers) as well as from those whose interests cannot be found in a (more) justified levying of land tax and from those who fear to lose land on behalf of several government activities.

This fear of loosing land concerns sometimes the fear for compulsory acquisition. Sometimes it is contended that land recording is merely a preliminary measure designed to enable the government to acquire private interests or to confiscate them at will. It cannot be denied that clarity of title and determination of boundaries aids compulsory acquisition. It must be pointed out, however, that compulsory acquisition may proceed without prior registration but that recording actually protects the landowners by confirming their interests in the land and hence their right to receive compensation.

5. Sometimes it is feared that introduction of land recording might lead to more bureaucracy, hampering conveyancing processes and causing more costs by fees.
6. A decisive objection sometimes is the lack of money and know-how. It may be clear that objections which are based on fear can be removed or reduced by explaining the significance of land registration and cadastre for both citizen and State in an open, simple manner, clear to everyone concerned. In this connection is remarked that a land recording system does in fact not change anything in rights to the land, it only registers.
7. There is often a concern that once traditional owners can mortgage or sell their land, that this will occur and in time they will be added to the statistics of the worlds landless. This has occurred in Chile, Alaska as well as other countries.

Concerning the usually crucial objections of lack of money and know-how the following aspects should be observed.

1. They can be reduced or removed by development aid, both financial as for instance by training and assignment of experts who have an insight into the broad field of land recording aspects.
2. A part of the costs can be recovered by government from fees for issuing of certificates and for the maintenance of the recording. The level of the fees need not hamper the support of the people.
3. Costs must be limited by the application of suitable low-cost technologies and efficient procedures.
4. Besides, as said before a land recording system can, within the framework of a multipurpose cadastre, avoid duplication of work in gathering the same basic data by several institutes. Thus government costs are saved as well.

These low-cost elements have to find their legal basis in a land recording legislation which, especially in developing countries, has to be simple, consistent and easily understood.

After the foregoing discussion of the role of land recording for the development of the countries, the paper will continue by discussing the aspects of land registration and cadastre themselves.

v. ASPECTS OF LAND TENURE, LAND REGISTRATION AND CADASTRE

A) LAND TENURE

In a recording system, data concerning land tenure plays an essential role. The concept of land tenure can, in this context, be defined as "the act, right, manner or term of holding a landed property" or as "the nature of the legal estate in land". If land tenure is related to the broad field of land use it is more than the "man-land" relationship. In that connection it can be defined as the institutionalized relationship of people involved in the use of land and the distribution of its products.

Every well organized form of a human society will define rights on the land. Very often there are strong ties with the fundamentals of the social structures and the religious beliefs. Being able or not to exercise rights on the land can create deep emotions and often plays a vital role in the individual's feeling concerning the possibilities of participation in society. Besides it is a strong factor in the considerations to invest labour and/or capital in the land.

In spite of the wide spread of the Western range of thought and its institutions in developing countries during the colonial times, there still exists an enormous diversity of ideas concerning the nature of rights in land.

Those who are educated in the Western tradition like to think in terms of a system of categories of rights which in a certain situation defines a relation which is clear and familiar to the concerned parties. However, this figure is generally not applicable to many developing countries. The systems of rights on the land, especially in the rural areas, are often not clear and are often hardly understood by those educated in Western style.

The Western meaning of expressions as land, ownership, rights, freehold, leasehold and inheritance, are often inadequate for traditional rural communities and therefore not to be copied and by no means directly applied. Besides, often registration of these rights does not exist or exists only in a very primitive form.

In many parts of Africa and Asia it is sometimes impossible to determine the legal situation of a piece of land, because there is a large set of family and society claims on it, in which also ancestors and descendants have an important place. In the mind of the people in these areas, land belongs to a vast family of which many are dead, few are living and countless numbers are still unborn. Many of these tribal, clan or family claims are based on customary land tenure.

Globally there exists an enormous range of rights on land. In Anglo-American law alone fifty recognized forms of rights in land distinguished. The most important Continental European legal systems give a similar picture or contain even more

forms.

This high degree of diversity is to a certain degree related to commercialization of society in these areas. In developing countries this diversity is much less. In relatively undeveloped areas with primitive agriculture on the basis of shifting cultivation the "man to man" relationship prevails of course over the "man to land" relationship which is likely to be found in countries having scarcity of land for agricultural development and urbanisation.

In many former colonies, a double system of rights has been introduced, one for the colonizers and one for the autochthonous people. E.g. in former British colonies crown lands (generally colonial settlements, mines, harbours and the like) were subject to British law, while the rest of the area (often 80% to 90%) remained subject to the current customary law. The latter law was usually unwritten, vaguely defined and differed per tribal territory.

This mosaic of possibilities still exists in many countries.

Similar features occur in other countries which have in former times been colonized by e.g. Western countries.

It is interesting to observe the spread of the different law-families which influenced the land tenure systems as shown in Diagram 4.

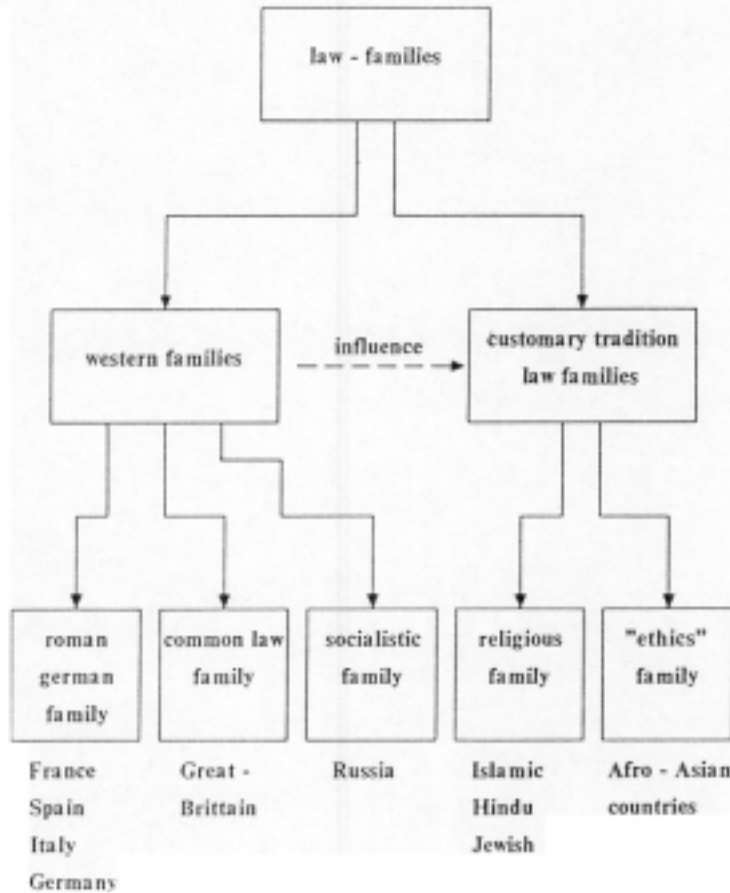


Diagram 4

In this regard, dealing with land tenure, the accent has been placed on developing countries. This has been done in order to draw the attention of those experts from developed countries who are involved in land recording in developing countries to the fact that notaries, lawyers, surveyors and registrars may and will be expected to have some knowledge of and some feeling for the land tenure system which is applied there, including its social-cultural backgrounds. It is not realistic to expect from these experts or consultants that they obtain complete insight into this subject-matter. This is most probably not possible for somebody from outside the culture existing there.

B LAND REGISTRATION

1. In spite of the differences between the systems of the numerous countries operating a land registration system (either deeds or titles), there are four basic legal principles that can generally be recognized, viz.
 - a. the booking principle
 - b. the consent principle
 - c. the principle of publicity
 - d. the principle of speciality.

Ad a: The booking principle implies that a change in real rights on an immovable property, especially by transfer, is not legally effected until the change or the expected right is booked or registered in the land register.

Ad b: The consent principle implies that the real entitled person who is booked as such in the register must give his consent for a change of the inscription in the land register.

Ad c: The principle of publicity implies that the legal registers are open for public inspection, and also that the published facts can be upheld as being more or less correct by third parties in good faith, so that they can be protected by law.

with regard to the public inspection, it can be noted that in various countries the land register is open for inspection to anybody who wishes to do so (Netherlands, Belgium, France), or by anybody who has a legally recognized interest in what is published (Federal Republic of Germany), or by the registered owner or anybody who has the permission of the registered owner (at present in England, probably until 1990). In the last case the privacy element is very dominant.

There is a tendency to open those registers which were up to now more or less "closed" for inspection by everybody, so that it can not only assist in the simplification of conveyancing but will also help in identifying the ownership of properties for other purposes, such as conservation

and development. Thus the land register will be an important component of of a broad land information system. Evidence of this tendency can be found in England, where the Land Registration Act of 1988 heralds the end of the privacy of the register. Because of practicality, it is unlikely that this Act will be brought into force before 1990.

Ad d: The principle of speciality implies that in the land registration, so consequently in the documents submitted for registration, the concerned subject (man) and object (i.e. real property) must be unambiguously identified.

In this relation it can be mentioned that besides the usual indication of the subject (man) by name, the use of civic code or personal number of a person could obviously be convenient to be included also in the land register and relevant documents. However there are sometimes privacy difficulties arising from this because of the use of the personal number in automated systems bringing the possibility of combining sensitive personal data.

In many countries identifying the land objects ("where and how much") is the task of the cadastre, which will be discussed later.

2. Depending on the nature and extend of involvement of the State in the conveyancing process, which reflects activity or passivity of the State and which has the root in the "legal" history (in Continental Europe Germanic law and Roman law) there exist two recognized systems of land registration, the deed and the title registration system.

A deed registration system means that the deed itself, being a document which describes an isolated transaction, is registered. This deed is evidence that a particular transaction took place, but it is in principle not in itself proof of the legal rights of the parties to conduct that transaction and, consequently, it is not evidence of its legality.

Thus before any dealing can be safely concluded, the prudent purchaser must trace his ownership back to a good root of title.

Deed registration, whether the "basic" or the "improved" version (= based on a survey and on documents of competent notaries as well as on an active role of the registrar) is usually applied in countries which are mainly based on the Roman law (in Europe: France, Spain, Italy, Belgium, the Netherlands) and so in those which were in former times influenced by these countries (South-America, parts of North-America, some African and Asian countries). This is also the case historically with English common law systems.

Usually a deed registration contains two kinds of registers, namely one for rights of use and one for rights of security such as mortgages.

A title registration system means that the deed is not registered but the consequence of that transaction i.e. the

right itself (=title).

So the right itself (title) with the name of the rightful claimant and the object of that right with its restrictions and charges is registered. By this registration the title or right is created.

So one could say that deed registration concerns the registration of the legal fact itself and title registration the legal consequence of that fact. In other words the relation between deed and title registration is similar to the relation between legal facts and legal consequences.

Concerning the administration itself it can be remarked that a title register usually contains three parts: 1. the part of description of the property, 2. the part of the proprietor, 3. the part of the charges or encumbrances. The first two parts can be indicated as the credit part, and the third part as the debit part.

3. Concerning the effect of a land registration system, especially title registration, three principles are sometimes upheld namely the mirror principle, which means that the register is supposed to reflect the correct legal situation, the curtain principle, which means that no further (historical) investigation beyond the register is necessary, and the insurance or guarantee principle, which means that the State guarantees that what is registered is true for third parties in good faith and that a bona fide rightful claimant who is contradicted by the register is reimbursed from an insurance fund of the State.

4. Sometimes a deed registration system is indicated as to be synonymous with a negative or a passive system and a title registration with a positive or active system.

Usually in a deed registration system, recording does not automatically guarantee the concerned right. Such a system is negative and as a consequence passive in analysing the documents.

A title registration, as mentioned, guarantees the title, gives positive legal force, so as a consequence the State has to be active in analysing the documents in order to avoid damages. The more that is guaranteed by the State, the more investigation has to be done by the State, or, in other words: the more positive a system is the more activity of the State is required.

5. It should be kept in mind that the distinction between registration of deeds and registration of titles is not a black and white matter. In fact all the existing systems of land registration are something in between these two main concepts. For instance an improved registration of deeds system like the one of the Netherlands, where the actual legal situation as derived from the deed register is registered systematically and orderly in a cadastral register (cadastre) tends in practice towards a registration of title. In this case acceptance of the correctness of the carefully compiled deed registers in combination with cadastral registers works in practice as satisfactorily as in a well

maintained registration of title

This correctness depends of course on a well executed adjudication which gives the basis for individual registration and which is an essential prerequisite of a land recording system.

Adjudication is the word used in many English-speaking countries to describe the process whereby all existing rights in a particular parcel of land are finally and authoritatively ascertained for recording purposes.

It has to be pointed out that in view of the correctness of the relevant systems it is important that the relevant document, the survey and the registration are composed and executed by well trained persons working in good mutual co-operation. Cooperation of the triangle notary, surveyor and registrar is essential for the effect that the system must have. The ability and cooperation of these experts are maybe more important than a consistent detailed legislation.

In order to obtain this cooperation it is important that the three categories of experts know from each other what their influence is on the total process of land recording. Therefore in their training, attention should be paid to an insight into the basics of each others disciplines.

6. The terms deed and title registration usually suggest purely legal, descriptive systems. They are mainly concerned with the right (title) and the rightful claimant. The importance of the component legal object or land unit or parcel, which is related through surveying and mapping, is not always recognized. This surveying and mapping component is essential for an effective land recording system, as discussed below.

c) CADASTRE

Cadastre is related to the principle of speciality as indicated before (in B.1.).

The main task of the cadastre is the setting down -on the basis of the existing or expected legal situation- of parcels, which are represented on a large scale map with a parcel identifier. This identifier is used in the land register to indicate the legal object in a special, short and unambiguous manner (speciality).

As already mentioned this identifier (parcel number) connects the legal part with the cartographic and surveying component.

Besides the cadastral map there exists also a descriptive part of the cadastre: a register which contains physical attributes of the parcel i.e. identifier, local location, area, kind of use and abstract attributes like data for land tax such as value, proprietor and/or taxpayer. Usually there exists also a reference to the land register. One can say that the task of a cadastre is mainly geometrically oriented i.e. fixing and re-

presenting the parcel

Because the heart of a cadastre is the parcel, it is necessary in this context to highlight some relevant aspects:

a. Generally -whether for legal use or for ecological application- a land parcel can be defined as a continuous area of land within which unique and homogeneous interests are recognized.

On behalf of legal cadastral purposes such a parcel reflects a homogeneity in legal interest and on behalf of use purposes such a parcel reflects a homogeneity in use, however the legal parcels is not always the same as the parcel defined by land use.

Usually these parcels are surveyed and mapped by a closed line and indicated by a number (parcel identifier) on the map.

b. In relation to the parcel boundaries the question on what data can be relied plays a role. The English system relies mainly on physical boundary features, man-made or natural. The precise position of the boundary within these physical features depends on the "general" law of the country concerned. This boundary system is known as "general boundary system". The system provides, however, for the precise surveyed boundaries to be "fixed" if desired by the owners. After entering the precise survey data in the land register the boundary is also "legally" fixed for everybody. Without registering these precise survey data these boundaries are not legally fixed and have legally the effect of "general boundaries". The term "general boundaries" originates from the English land recording system.

The choice between "general" and "fixed" boundaries depends on the pace of creating or updating the system, the existence of physical features, disputes to be expected, the amount of necessary security and the costs. A cost/benefit analysis is of course necessary.

Concerning the identification of the parcel it is noted that this has to be simple (easy to understand), unambiguous, reliable and flexible (compatible with various parcel-oriented info-systems).

There is a tendency towards using, besides the parcel number, also an identification by coordinates. This is done due to the need or desired to link with other systems and of cartographic representation of various land recording data. Coordinates however are not good primary identifiers.

VI. ORGANIZATION

The success of setting up and maintaining a land registration and cadastral system depends upon adequate publication of information, trained staff, adequate three-way cooperation between notary, surveyor and registrar on the one hand and the organization of the relevant institutions on the other hand.

In many countries however, all these functions are carried out by the cadastral office as a service to the people.

Because land registration and cadastre complement each other and, together, give answer on the questions as to who, how, where and how much, there has to exist a close interaction between these two institutes.

Because of the history and the differences in character between the two disciplines the two institutions are in most of the countries separate organizational units, mostly under the responsibility of various ministries.

For historical reasons a reorganization aimed at bringing both institutions under one roof would be complicated in many countries, albeit desirable.

If it is not possible to bring them under one roof, it should be ensured that there is a close mutual cooperation between the two institutions.

Whether one likes it or not, at the implementation of automation a close cooperation is necessary. The importance of these close institutional linkages cannot be overemphasized.

VII. DEVELOPMENTS

The derivation of the word "cadastre" is uncertain, but it is thought to come from the Greek word "katastikon" (notebook or businessbook) or the late Latin word "capitastrum" (register of tax). Forms of land recording systems have been known to exist for thousands of years: the eldest known record is a Chaldaic table from 4000 BC. Furthermore we know that some form of a land recording existed in ancient Egypt, Greece, Rome and with the Aztecs, Incas and Chinese. Famous in our times are the surveys of the Roman Empire ordered by Emperor Diocletian and the Domesday book ordered by King William the Conqueror in medieval England.

However, from today's point of view, "modern" cadastres began on the continent of Europe in the beginning of the 19th. Century. The view of the Physiocrats was accepted that the land is the basis of all richness, so that the funds for the maintenance of society should be obtained by taxing this land. Thus land tax systems developed, ultimately based on the taxable revenue of the separate parcels of land (including buildings), subdivided according to their use like agriculture, industry, dwelling sites etc.

Every type of land use had a different taxable revenue upon which, in accordance with the requisite tariffs, a separate assessment was imposed. For this reason splitting up the land into parcels, measuring of the boundaries and calculating the acreage of these parcels became necessary. As well, pending the survey, the names of holders of real rights on these parcels were registered, partly on the basis of local investigation and partly by examination of available documents. For efficiency reasons the parcels were depicted on a (mostly large scale) map and given a unique, unambiguous identifier. This

identifier was also used for the registers in which holders of real rights with their parcels and the necessary tax data like land use and acreage were denoted. Thus the (tax) cadastre developed.

Land registration, that is the publication of transfer or establishment of real rights on immovable properties, had been compulsory for a long time in large parts of Europe in those days.

For obvious reasons, already from the introduction of the cadastre, the cadastral map has also been used as a means to identify lots of land as the object for the establishment or transfer of real rights. Besides land registration was a good means to keep the cadastre up to date. As land registration and cadastre obviously complement each other the concept of the land recording developed. Even so that in some countries the original fiscal aim of the cadastre lost its importance, and the legal protection aspect became the dominant factor. This is sometimes expressed by calling the system a "legal cadastre".

It is accepted that society developed as a consequence of a number of factors such as an increase of population, industrialization etc. Society became more complex for both governments as well as for other institutions with the result that more complex and complicated tasks had to be performed. In order to perform these tasks properly, more and more information was required. It is said that, after the agricultural and the industrial societies, we now live in an information society.

In order to meet part of these demands, land recording systems in several countries evolved into what are called multipurpose cadastrals. Originally these multipurpose cadastrals tended to be parcel-oriented information systems containing a variety of information about the physical, legal, economic and social aspects of land. Sooner or later however, such a collection tends to have an unmanageable size because eventually too many kinds of data must be inserted. The real objective of any multipurpose cadastre is providing a service through which the dynamics of the land parcel may be studied. This can also be obtained if the land registration serves as a parcel-oriented basic registration, i.e. a systematic collection of information concerning persons, institutions and objects which, for a complete administrative area, are kept up to date in the same way, on behalf of their use by several persons and institutions which are in charge of executing several tasks.

It should be clear that it is not necessary and in fact not practical (if ever possible) that the land recording system itself, or any other system, contains all the needed data.

During the last decade, the concept of the land information system (LIS) has been developed. LIS is a general, collective, term for all land related data banks or systems. It is a genus indication for all the systems that have one point in common: the data are relevant to a fixed location on, in or under the surface of the earth (the geographic unit).

~ LIS is a concept: it is a network attempting to integrate all kinds of land related data (cadastral, infrastructural, environmental, socio-economic). Within such a LIS-network, requiring an enormous amount of co-ordination, standardization etc., land registration can play the role of a canvas to which many other systems can add or connect their particular data. Thus the land recording can be a link between many land information systems.

When describing these developments it should be kept in mind that they do not occur simultaneously over the world. In fact every country is in one of the described stages: from developing countries where the conviction is growing that a well functioning land recording is an indispensable instrument for their development, up to some industrialized countries where very complex and sophisticated automated cadastral data banks are already operational.

VIII. AUTOMATION

As described above, the growing complexity of society and the resulting growing complexity of a number of tasks to be performed require an increasing amount of information. Fortunately a solution is being provided by technology: electronic data processing.

The advantages of computerization of information systems (of which land recording is just one kind) include the larger volumes, the variety and the speed with which data can be manipulated and processed into information.

Besides automation can solve problems of storing capacity and will free the personnel from the most tedious work.

The disadvantages can be found in the fact that capital must be invested in the equipment and the software. As well, staff must be trained and displaced labour must get alternative employment, however computerisation does not always lead to staff saving. The most expensive and time consuming part of establishment of a computerized land recording system or in computerizing an existing one, is often the collection or conversion of the data. This process may take at least a decade. During that time the user requirements may have been changed. It is estimated that computer hardware and software is between 10-25% of the costs of establishing a LIS.

At present, the countries which did computerize their land recording have a capital-intensive approach. Savings come from reduction in duplication of effort, wages and salary bills and from the gain in all-round efficiency. Further benefits come from exploiting the capabilities of computerized systems to provide further information to an extent that is hardly possible by manual methods.

It is predictable that sooner or later all countries will operate computerized land recording systems. The question is, for each individual country, to find the point where the advanta-

ges outweigh the problems. Certainly, developing a computerized system is not an easy task and should not be entered into lightly. It is important to firstly improve the manner of updating along with the legal and institutional arrangements prior to computerization.

In addition it should be stated that the pace of change and development is rapid. The cost per unit of handling will be significantly reduced in the near future, as well by microcomputers (or even personal computers) as by new storage systems currently under development (for instance the digital optical discs). Besides computers become more and more user friendly, and so easier to handle. However it must always be remembered that establishing a manual land registration system is certainly not simple. Establishing a computerised system is much more difficult.

Also the newer computer systems can usually be connected to other systems, although this often creates major problems especially with graphic data. Thus it will be easier to built up the technical environment for the aforementioned framework of land information systems and interlink this framework to other systems like the population register (which has been done already in Sweden). It is highly desirable to automate the alphanumerical data first. Automating the graphic components is very complex and can often wait.

In order to reach the automation objectives: increase of quality, service, effectivity, efficiency, reliability, data protection and exchange of data it is necessary that attention be paid to cost/benefit analyses, coordination (same data, systems, who must do what and when, responsibility), standardization (hardware and software), training and regulations and most particularly to updating and maintenance of the data.

IX. DATA PROTECTION

Data protection concerns safety, security and integrity of the stored data. The problems concerning data protection are not restricted to systems of land recording, but concern all information systems. In fact these problems are not new. Any government in any organized State will have collected data to be protected, but by the tremendous increase in information manipulation, both needed by the growing complexity of society and made possible by modern technology, these problems have become more urgent, more important, more extended and more complex.

Two elements can be distinguished in data protection, viz. the physical safeguarding of data and the protection of the personal privacy of the individual citizen.

Physical safeguarding can be distinguished into safeguarding against loss, whether by acts of nature or deliberately by man, or against unauthorised use or alteration by man.

Safeguarding against loss can, besides taking care of suitable

equipment and environment (sound, stable housing, foolproof computers etc.), be ensured by "shadow records". Land recording data can e.g. be copied on microfilm or optical discs. It should be noticed that copies of computerized files on magnetic tapes have a limited lifetime.

Although ultimately any system can be defeated, there are a number of technical solutions to prevent unauthorized use or alteration of data. Besides cypher codes, passwords and the like, due attention should be paid to the human side of this safeguarding: A strict scheme should be drawn up and maintained prescribing who is authorized to execute which alterations, who determines the codes and passwords and who may know them. The weak link in automated systems are the lines of communication. Certainly as often public telephonerlines are used for data-transmission, line tapping can hardly be prevented. The only remedy are cryptographical aids. Again it is very important to draw up and maintain who determines and who may know the keys to these means. It must be remembered however that the traditional manual methods were much *more* open to abuse than in general computer systems. It is important to accept a certain risk factor for the economic development of a system.

In protection of the privacy, again two aspects can be recognized, viz. the protection of privacy in its true sense and the protection of the individual against the excessive power a government might obtain by being much better informed.

By privacy in its true sense is meant the classical, however controversial, definition of Westin, namely the right of individuals to decide for themselves when, how and in what measure information concerning them is passed to others.

Possible measures for protection of the privacy in its true sense, as considered in many countries and already executed in some, are:

1. compilation and maintenance of specific or certain kinds of personal data files is prohibited,
2. storage of specific data in a data file is prohibited (e.g. data which are not necessary for the purpose of the system) ,
3. certain ways of using the stored data are prohibited (e.g. certain linking of data, or passing data on to others).

The citizen should be granted a right of inspection in order to control whether a given file contains data about him, and if so which data. In addition he should have the right to have data which are not or no longer correct altered.

As a remedy to an excessive government power by an advantage in information the law could prescribe that:

1. no decision concerning human conduct may be taken on the basis of a personal profile produced by a computer, and
2. if a decision is taken concerning a citizen, the person will have the right to know the information on which the decision was based and, if necessary, to oppose it.

As stated before these problems concern all information systems, especially if these information systems are computerized. In the area of land recording, specific problems could be found in the area of so-called "active publication": in a traditional system data were there waiting for anybody who wished to consult it. This could be called "passive publication". In extended computerized systems however, the possibility is given that extended output is given structurally. It could, for example, be an enormous advantage if policy-makers could gain an insight into the average sales price of dwellings in a certain area. But what if brokers or banks ask for a list of owners whose mortgage will be paid next month (very interesting information for them). Whether or not such "active publication" will infringe the personal privacy of citizens will probably depend on the possibility to keep the supplied data anonymous. For the land recording therefore a set of regulations will be needed indicating which data can be supplied to whom and in which combinations.

xx. CONCLUSION

Countries world-wide are placing increasing emphasis on the proper management of their land resource. Developing countries are particularly concerned due to rapid urbanization and population growth resulting in increased poverty and environmental degradation with few solutions in sight. Improving land management in both rural and urban areas is an extremely complex process involving a whole range of historical, legal, institutional, economic, social and environmental issues. However it is increasingly being recognized that an efficient and appropriate land recording system is a key factor in improving land management in both rural and urban areas. An appropriately designed and implemented land recording system can contribute to economic improvement and the reduction of poverty.

This paper has described and discussed the broad range of interpretations of the term land registration and associated terminologies. It has attempted to analyze the benefits and disadvantages of land registration in the context of both developing and developed countries. The paper has argued that there is no one ideal land recording system for any country or jurisdiction. Each jurisdiction should design a system which best suits its needs, however there are a range of model systems or components of systems to consider for guidance.

The paper emphasizes that land recording does not fall easily into two groups, namely title and deeds registration. There are a whole range of systems which have components of each general type. The "ideal" system for a country or jurisdiction depends on many factors. It is however generally recognized that a land recording system should be parcel based, not people based, with the parcel being uniquely described on some form of map supported by an appropriate land survey system.

In designing a land recording system the paper recognizes the close links that must exist between any new land recording system and the existing system.

ding system and the existing land tenure system. It emphasizes that a new land recording system should not change the existing tenurial relationships but simply record them albeit this is difficult in some jurisdictions and particularly those with customary tenure. Importantly land recording is ~ land reform although it is one mechanism which can support landreform but that is a political and social issue. The clear recognition of this principle is particularly important in developing countries where the perception, complexity and importance of land tenure is often very different to the western understanding and perception.

The paper concludes by reviewing the impact of computerization on land recording systems. It is stressed that computerization is not easy for a whole range of reasons and involves many complexities. It is essential to design an efficient and workable manual system prior to computerization. In addition computerization raises many issues such as data protection and privacy of information which need to be addressed to the same extent in a manual system.

Both developing and developed countries require an appropriate land recording system for the economic development and efficient land management of both urban and rural areas. The full implementation of land recording systems must be seen in the long term however it is essential to start in the appropriate direction in an incremental manner as soon as possible within an overall framework for the improvement of land administration and land management.

XXI RECOMMENDATIONS

Within the context of this paper the recommendations of Commission 7 of FIG, adopted during its annual session of 1989 in Istanbul, should be mentioned. They endorse the following statements:

-The members of Commission 7 of the FIG believe that it is essential for both developed and developing countries to have an appropriate land registration (cadastral) system, preferably one which serves "multi purposes", as a central component of an efficient land management system for both urban and rural areas of those countries.

-Commission 7 of the FIG believes that introduction of land registration systems in developing countries should be rapid and be on low cost and cost effective, within an overall land management strategy.

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Author's addresses:

Prof. J.L.G. Henssen
waltersingell,
7314 NK APELDOORN, The
Netherlands,
Tel. : **31 55285111,
Fax: **3155557739.

Prof. I.P. Williamson
The University of Melbourne
PARKVILLE, VICTORIA 3052, Australia
Tel.: **61 3 3446806
Fax: **61 33472916