

# THE IMPORTANCE OF CO-ORDINATED LAND ADMINISTRATION IN THE NEXT MILLENNIUM

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## ABSTRACT

Any attempt at foretelling the future, even when trying to look through the “crystal ball” of an United Nations Organization is merely to record our attempts to reduce just a little the ambiguity of a rapidly changing world. Not only is the temptation great at the end of a century to make all kinds of bold statements, but at the end of a millennium, it is irresistible. With all the usual caveats in mind, however, it is also a certain responsibility to attempt to identify the trends and their direction from the perspective of more than 175 countries in the FAO family. All the Member Nations of FAO are involved in changing, adapting or creating systems for better land tenure regularisation and administration. These efforts reflect the need for addressing the age old questions to which land tenure institutions must respond. Who has rights to how much of a given land resource, for how long and for which purposes.

*Keywords and phrases:* CEEC Central and Eastern European Country

## I. Awareness of Finiteness of Resources

Concern over the relative value or relative shortage of certain resources are part of our recorded history. Writing from FAO offices in Rome, Italy, the authors may be permitted to use as an example the role of the food and market shortages suffered by the Gothic peoples in 265 AD and the movement of thousands of families into Roman territory, a migration and settlement that inexorably changed the flow of Mediterranean cultural history. These kinds of location-specific shortages have a certain ideology that is still found in many, if not practically all, of the conflicts and wars that we have today. There are perceived shortages in a specific context and there is a call to do something about it. This all too human a response is fuelled by the putative knowledge that there is lots more of what is needed somewhere (or under the control of somebody) else.

While the search for that which was limited at home, but was held in abundance by someone else, did much to stimulate different ages of discovery, on the negative side it also provided motivation for countless wars. But these reactions are vastly different than the concept of shortages that concern scientists and concerned citizens today. They

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are seen now for what they always were – short term adjustments. What has happened is a paradigm shift during the second half of this century.

It was not all that long ago that our models emphasised how natural and social systems tended towards equilibrium. Pollution, harmful land use practices, poverty, social exclusion and bad government were phases that all societies had to go through. With the vastness of the oceans, the forests, the open plains, whatever problems we created through industrial activity or social experiments, nature would rectify it in the end (with a little help from science). Such a cosy picture began to crumble as more and more of the world's citizens began to notice that things were not going right. Chernobyl, Bophal and similar localised disasters focused attention on the potentiality of things going seriously wrong for all of us – not just those who lived a long way away. However, I agree with Mrs. Bruntland and her colleagues (Our Common Future, 1989) that it was a tool, the expansion of remote sensing to space, that really united a world-wide concern with a new concept called sustainability. All of a sudden the earth was not so vast at all, it was quite tiny and vulnerable. Bad land management that had seemed so far away, now could be seen in the satellite photos.

The Rio Conference in 1992<sup>2</sup> was singularly successful in capturing the imagination of ecologist and pragmatist alike. Since Rio, our appreciation of the inter-relatedness of natural resource systems is still growing daily. Concerns about the ozone layer and emissions is a topic as likely to appear in the local paper in Rome, Bangkok or San Francisco, as in Melbourne, Perth or Sydney. We realise now that uncontrolled forest harvesting in the tropics does have adverse effects on people living in temperate climates far removed (v. Baraclough and Ghimire 1998). This recognition of the interrelated nature of environmental abuses far away and situations such as the closure of the Great Banks to cod fishing off Canada caused the land tenure and natural resource specialists in developed and developing countries to share a common goal as never before.

## **2. Cumulative Processes:**

One hopes that the decade that has passed since the collapse of the Berlin Wall is sufficient for us to return to a very powerful idea of the philosopher Hegel. Hegel observed that many natural, historical and philosophical processes are characterised by small incremental changes that accumulate to an extent that they pass a threshold level that results in a change in the very nature of the empirical reality. One popular example used to illustrate this is water as it accumulates energy degree by degree till at 100 degrees Centigrade it becomes steam. The present paper argues that something similar has been happening to the world in which we live and will illustrate the point by looking at three examples.

The first is incremental demographic change. Population has been growing in a most naturally incremental way, birth by birth. But the resulting situation is today anything but “business as usual”. Habitat II was the UN forum (1995) to bring this realisation to the policy arena and to underscore the fact that within the next decade we will live for

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<sup>2</sup> The UNCED (Agenda 21) held in Rio de Janeiro in 1992.

the first time in human history in a world in which the majority of people are urban and urban centres have become the “engines” of growth and change. Indeed cities are growing at rate such that in the first quarter of the next century more than 88% of the 2.3 billion increase in population will be urban (UN 1998). This relatively abrupt change in our “reality” confirms the seriousness of the observed competition of uses for non-urban space and resources, especially water as we will detail below. What it also means is that our comfortable notions of what is urban and what is rural do not match reality. This was brought home to us when it was observed that the density of population of Java and Los Angeles were about the same. We need to develop a conceptual framework not only for the urban/peri-urban, but also the peri-rural (Groppo, ed. 1997). Thus, we will witness an increasing demand for the multi-purpose<sup>3</sup> use of rural space.

Another of these cumulative processes that have caused a change in the “state” or nature of the phenomenon is the gradual, but inexorable integration of the world economy. Political push factors have already become a major mechanisms in this process. One only need witness the high level attention WTO meetings receive from world leaders and policy makers, the press as well as the academic community. As common markets are created, there is a need to standardise the rules of the game and all economies that hope to benefit from the growing size of the market have to make certain changes in their legislation. This is as true for the G7 as it is for Group of 77.<sup>4</sup> The essential point is that the world economy as it is emerging is different than the multinational company of just a few years ago. Today, even small business and small investors are dealing internationally. This, of course, is related to the role of trade in our “brave new world”.

The concept of world economy cannot be conveniently separated for trade: The nature of trade depends on the ability to move the item being traded. On one extreme there are resources that cannot be moved (e.g., land); here, ownership comes to the land. At the other extreme are resources that can be moved easily (e.g., timber as well as land derivatives such as mortgage-based securities that are increasingly traded world-wide); here, the resources come to where the owner wants them. In the middle are those resources that can be moved but not always easily (e.g., water). Regardless of the nature of what is traded, trading and transactions will occur on a scale never imagined at the end of WWII. As registration systems computerise, they will help facilitate international transactions. There is little doubt that if things continue in a linear fashion that there will be increasing internationalisation of land administration operations.

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<sup>3</sup> For many years it has been common to use the term multi-function in referring to multiple, but complimentary users of rural areas. This concept grew out of land consolidation and farmland rationalisation programmes. Increasingly the economic value added to rural areas of nature preserves, hiking and biking trails, agro-tourism and so forth out-weighed pure crop production (Grossman and Brussaard 1989). Unfortunately, the term multi-functional has taken on new meanings in the WTO debates concerning agricultural production subsidies (FAO, 1999).

<sup>4</sup> This is reflected in the rapid sequence of Preferential Trade Agreements giving way to Multilateral arrangements to even broader WTO concerns following the Uruguay Round Agreement. This reflects the growing realisation that there is a need for standardisation resulting from 3<sup>rd</sup> party requirements. This has become very important in attracting international investment.

The third process is one well known to all, the advent of the age of information technology, IT. The increased use of computers and telecommunication technology is becoming both commonplace and necessary in all walks of life, not just commerce. It is already tending to lead to similar solutions because the same kind of problems are being addressed in different countries. Just to think about the “ground shift” changes implied by the internet, spatial data infrastructures and related data management and we are talking about the kind of changes that could not be duplicated with infinite amounts of pre-existing human and infrastructure capital investments. At the same time the awareness of what others are doing further blurs the concepts of land and resources boundaries that our classical cadastres and registries were meant to define

The impact on traditional concepts of “property rights” of these processes in their individual and synergistic manifestations will be tremendous. Increasingly we witness the willingness for resource use decisions to be a negotiable transaction through international bodies and agencies<sup>5</sup>. Not surprisingly we see everyday that things that were not traditionally handled as property (e.g., permitted pollution limit allocations), increasingly have their allocation and uses determined by market transactions. One of the most important areas where we can expect to see this in the next century is in the allocation and use of water<sup>6</sup>

### **3. The processes above will lead to water distribution, consumption and pricing, one of the most important challenges for land tenure professionals in the early part of the new millennium.**

Expanding the base of registries and cadastres to reflect water rights will be the result of a growing awareness that public interests will have to intervene in access to what is becoming an increasingly scarce resource (UN 1997; Laureano 1999). A quick examination of our current state-of-the-art knowledge of reveals the following picture. Total water resources can be divided into “blue” and “green” water.

Blue water refers to water that is available in streams, lakes and groundwater aquifers. Most of this is “locked up” in glaciers and permanent snow cover and is not available through today’s technology. Freshwater resources available in rivers and lakes accounts for only 0.3% while groundwater constitutes about 30%. (Lundqvist and Steen 1999: 172) In its attempt to assist Member Nations to understand the complexity of the moisture cycle, FAO contrasts “blue” water with “green” water which is that moisture available in the root zone (see FAO 1997: 4, et passim, for a more extensive discussion).

FAO, quite naturally, is concerned with growing competition over available water resources and its mandate to reduce the amount of severe under nutrition by half in the

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<sup>5</sup> The numerous fisheries and forest conventions negotiated under the guidance of FAO is just an example. It is no small matter to have international agreement on just what constitutes a cubic meter of lumber from trees felled in Sumatra or Papua New Guinea by companies from Malaysia working under a sub-contract with those in the United States, Canada or Sweden.

<sup>6</sup> . Water security is the main concern of the World Water Vision/UNESCO. Its web page is <http://www.watervision.org/>

next two decades. This goal is also exacerbated by food need trends vis-à-vis population growth: FAO estimates that the annual water requirement for food security is between 1,000 to 2,000 cubic meters per person. (Lundqvist and Steen 1999 :167). Today, in 26 of FAO Member Countries the annual water availability is below the water scarcity benchmark of 1,000 cubic meters per person and some estimates place perhaps as much as one third of the world's population as living in countries that already face medium to high water shortage risk (ibid., Postel 1997; UN 1997).

The role of water in increasing food production is well known. Placement and timing of water is the crucial factor in agriculture being able to match the food needs of a growing population. It is also essential to break the cycle of droughts and food security in arid/semi-arid environments. However, today irrigation already uses about 70% of 4,000 to 5,000 cubic kilometres of "blue" water resources which are withdrawn each year (Lundqvist and Steen 1999:175; UN 1997). One can easily see the dimensions of the problem we are facing. Not only have almost all of the readily available water sources for agriculture already been defined and put to use, but we are witnessing a degradation of water quality. Also, attention is being drawn to related problems associated with nitrate, etc. contamination of the ground water table in North America and Europe, as well as developing regions.

There are several important concurrent tendencies that are taking place. The first is that expensive water resources from irrigation are increasingly being diverted to high value crops (Perry, et.al. 1998). But the other, and major trend is increasing competition from urban and industrial uses. The cost of providing water to cities is proving to be two to three times more expensive that a decade ago. Even more alarming is the fact that our extraction of blue water for current uses already is increasing at a rate that is twice or more as fast as population is growing.

It does not take much imagination to see that with growing population, rapidly growing urban centres and ever more pressure to stabilise and provide predictable food supplies through irrigation is going to create a major policy confrontation (Hasnip, et al. 1999; Huber, et al, 1998). We will need much improved water distribution (quantity and quality) if we are to meet basic requirements of all urban dwellers. At the same time we need to remind ourselves that that water quality and quantity problems for agricultural populations has also yet to be resolved.

The implications of these trends which appear to be on a collision course have been brought to the public debate by Earth Watch and others (Brown and Halweil, 1998). While this is a much appreciated service to make us aware of the situation, much important work remains to be done.<sup>7</sup> Indeed, the process ahead is not obscure at all.

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<sup>7</sup> Of course, the post-Brutland Report generation of scientist is not the first to understand that some day the population of the third planet would be forced to confront the earth's finite sustainable resources base. Any quiet afternoon spent in FAO's extensive older collection will reveal many prescient thinkers. Scientists like farmers are a product of their own times and place and the scientific community of the day was not ready to grasp the relevance, nor indeed to possess the basis to judge the relevance of the observations of those who time has proven right.

What is interesting to the authors is the fact that the most promising actions emphasise a decentralised, participation enhancing strategy. For example the growing positive experience with water users association (see FAO 1994). Recent developments in Colombia and Mexico put our growing understanding of water users associations in a clearer perspective. In three separate studies (Vermillion and Garcés-Restrepo, 1999; Johnson 1998 and Levine, et. al., 1998) it was found that the transfer of water management from government agencies to the users results in generally better, more efficient water management, with the associated benefit of much lower operating costs. People taking charge of their own lives to determine the value of what was once a contested “free” good. This is further illustrated by the "Working for Water" project in South Africa which provides a good example of Government and Civil society working together. The over-planting of alien species in wood lots has led to unsustainable water extraction in periods of drought compared with the indigenous *fynbos* ecosystem with its 8,500 plant species. This in turn has exacerbated down stream impacts on rural livelihoods. Researchers have found that the indigenous *fynbos* systems are economically as well as ecologically much more productive. Indeed it is estimated that it would cost 2 to 7 times more to find alternative water catchment /production than the *fynbos* system. Since 1995, the idea is to involve civil society and the private sector in replacing alien plants with indigenous ones to restore a more sustainable water regime. This is an example of a water users group on a wide scale, but is probably a model of future civil society co-operation with government in water management. (Lundqvist and Steen 1999:174; taken from Enright 1999; Preston 1999).

Much of the current work being carried out by FAO is concerned with better water resource management systems. That is, a focus on getting better use from current availability of water by taking an agro-ecological zoning approach in relation to entire drainage basins (v. for instance, FAO 1997 and FAO 1998). This effort is also the prime work of our partnership organisations, such as the International Water Management Institute (IWMI), the World Bank (v. World Bank 1996), and others. For instance, IWMI has developed a long term project to develop a set of indicators for comparing the performance of irrigation systems so that the lessons learned in one area can more readily transferred elsewhere (Molden, et al. 1998). From the water manager and irrigation engineer’s perspective, most of the tools are at hand. It is just a matter of putting them together with imagination and under the direction of those most affected – water and land users. How this will tie in with developments in the democratic evolution of land administration will require increasing co-operation with land tenure specialists (Mahoney and McLaren 1999).

#### **4. Future Developments in land administration systems**

It is the contention of this paper that we specialists in land tenure related fields are searching for our own paradigm shift. We tend to congratulate ourselves on the ability to integrate/cross-link textual and mapped databases and how we have integrated and contributed to GPS and other geomatic technologies. Yet in the application of this technology in most of the world we are still trying to establish the kinds of rights based systems to land and associated resources that we did in 1856. Exclusivity of use is still

the implied goal in the justification of the vast majority of land administration projects, almost independent of the funding source, as a quick review of project proposals and associated web sites will confirm. Thus, the proposed development of national cadastres and other property registries all start with the vestiges of ancient concepts of allodial (civil law tradition), or “man and his castle” (Common Law tradition) property. This emphasis in land and other property registers persists in face of the fact that almost all of us in the modern sector operate with partial, temporary and distributed rights.

If the authors are correct in their assessment of the cumulative effect of the major trends that are changing the world as we understand it, our present cadastres, registries and associated LIS databases need to change quite radically. While we do not know what our property recording LIS will look like by 2050 (for example) we know that they will have to be able to meet the criteria of a much denser urban population who will be more interested in access to partial and temporal rights to space and infrastructure, than in outright ownership. In addition, this rapidly growing urban population will be much younger, and given the trends in employment of women, it will more gender assertive than the ageing populations of Europe and North America who are currently designing most of the new cadastres.

Should we succeed at all in reducing poverty, and in enhancing the sustainable livelihoods of a substantial proportion of the developing world, this urbanised, young population will be insisting on cleaner air, more safe water, more recreational areas, increasing participation (and hence decentralisation) in governance. Furthermore, we can anticipate a further blurring of rural and urban boundaries. Indeed the experiments in Korea today of making urban centres and their surrounding territory into a single planning unit will of necessity become more the rule.<sup>8</sup> The political reality will follow the emerging trend of rationing access and use of finite resources. The present economic wisdom seems to indicate that the market is much more efficient than either government or civil society at doing this. Indeed, if contemporary growth of environmental and Green interest groups is any indication of the future, water, land, air, natural resources, etc. will move in fact from particularistic to increasingly universalistic property right systems, in which the citizens of one part of the world will take a direct interest in how property someplace else is being used—to the degree that it affects them. Thus property registries and associated LIS will have to evolve quickly.

Thus, there is a need to build on our emerging sophistication in constructing cost-effective land information systems without the cultural baggage of a single juridical tradition. It is ever more important to know "what is where and where is what" as the *usus* and *fructus* of resources becomes ever more internationalised through “global” transactions. But LISs will deal with not just land boundaries but also water registries (probably first) then including all other marketable finite resources. This will require a certain harmonisation in legal as well as transaction procedures.

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<sup>8</sup> Under these experiments the decision to build, for example, a new freeway to assist urban commuters has to compete with plans for new feeder roads, better schools, etc. that are of importance to populations not living in the urban core ( UNDP Urban Forum, 1998, Curitiba, Brazil).

When countries enter trading zones or common markets, legislation is harmonised to some degree. Such standardisation has not yet affected land registration systems in any significant manner, even in jurisdictions such as the European Union, but this may change. However, even without political efforts to standardise, markets can influence the adoption of similar legislation, an example being the acceptance of legislation based on UCC Article 9 (financing secured by personal property) in Canada as well as the USA. Or the rapidly developing property market in the European Union is a good example of form following function. It may be possible that increased international trade (for example, in the form of mortgage-backed securities as secondary mortgage markets develop) may result in some standardised requirements for the primary mortgage market.

Small and large companies as well as multinationals operating in different countries are beginning already to demand some similarity in how they do business. This, for example, has given rise to the globalisation of accounting, legal, and banking services so that a multinational is able to deal with the same firms of accountants, lawyers and bankers in each country in which it works.

Today, however, land administration tends to be geographically constrained although some players have begun working in other jurisdictions. American title insurance companies are operating in the UK, having tailored their products to fit a “title” registry rather than the “deeds” registries of its home market. (Such use of title insurance may help to stimulate the growth of secondary mortgage markets.) Some enterprises have expressed interest in operating registry systems in other jurisdictions (under Build-Own-Operate [BOO] or Build-Operate-Transfer [BOT] schemes) but these have not yet materialised. However, contracting out may become more common if governments decide that they are not in the business of running systems or, if like the Philippines, they view private sector investments (through BOO/BOT schemes) as the only way of securing funds for modernising their registries.

A new role for international enterprises to operate land registries in jurisdictions does not change the underlying premises of land registration – there is one registry in a jurisdiction. All that has changed is responsibility for operating the registry. Reasons for single registry include:

- *quality control*: transactions, etc., are approved by government agencies
- *accessibility*: the need for a single authoritative source of information – a person need only to look in one place to get necessary information
- *cost-effectiveness*: to avoid duplication of building databases

However, is it not possible that the emerging technological developments challenge these conditions? For example:

- *quality control*: In developed countries, lenders and other financial institutions (insurers, etc.), are the group with the largest risk exposure. Will there not be a demand for a different risk management strategy?



- *accessibility*: Computer networks will allow access to information in different places. How long before the need for this information becomes imperative for cross-jurisdictional boundaries?
- *cost-effectiveness*: Can the cost of building competitive databases decrease? Will the cost of data become cheaper? Just as several credit rating companies can build databases on the credit history of people living in a jurisdiction, will it be possible for several registries to build property databases in that jurisdiction?

Such changes could allow more than one “registry utility” to operate in a jurisdiction. Major lenders may endorse the practices of several registry companies: you will get a loan to buy the parcel if you register the sale and mortgage transactions in one of the registry companies “approved” by the lender. Such registry companies would have to meet the risk management requirements (including insurance) of the lenders. A person wanting to search for a particular parcel would check the different registry companies operating in that jurisdiction. Since search would be free (being paid for by advertising) and on-line, multiple searches could be done simultaneously at nominal charge. A search-engine to research several registry companies simultaneously will no doubt be developed. Because registry companies will have to attract transactions for registration, they will have to develop products and services that are more attractive than their competitors.<sup>9</sup> Thus, the authors have little doubt that if the market continues to be the major allocator of goods and services, a global economy will encourage the development of multinational registry companies, either through mergers or acquisitions. Data stored by a registry company may be physically held in one country or several.<sup>10</sup>

In addition, a growing world economy will put a premium on good land tenure services. Those jurisdiction which emphasise transparency, accuracy of data and cost efficiency in its property LIS will be those that attract the most investment, just as is the case today. This is because in general, customers of land tenure services around the world have the same wishes: “service while you wait” or at least as soon as possible. This is not a cultural specific trait – no matter where people live, they do not like to wait. Increasingly, the wish for prompt service is becoming an expectation that has to be met by agencies. Comparisons will be made within a jurisdiction as other services (both public and private) improve. Comparisons will be made between jurisdictions by economic enterprises who work with other registries which have improved their service

Traditionally, registries paid most attention to process and little to the product. An application for registration was processed when it reached the top of the pile. There was no expectation as to how long a registration should take. Rather, requirements for processing were based on backlog: “Registrations are now taking about 4-5 months to complete”.<sup>11</sup>

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<sup>9</sup> Although to some readers this idea may seem revolutionary, Spain has been operating with multiple registries in each jurisdiction quite effectively for more than three centuries.

<sup>10</sup> A subject for a later paper is the whole issue of who guarantees the rights we register in our cadastres/registries when the owners are not neighbours or even fellow national citizens. This issue has already come to the fore in discussion of Central and Eastern European nations entering into the European Union. (See FAO 1998 for a discussion of the current issues).

<sup>11</sup> For example, if one of the authors was fortunate enough to purchase a new Ferrari, the market price would be more than the combined value of our two residences. Yet, it would take only an hour or so to

In a departure from this traditional approach, some registries are now defining target times to complete tasks. Not every registry offers the same services (e.g., telephone enquiries, fax back, etc) and registries often don't define a service in the same way.<sup>12</sup>. Jurisdictions may provide different target times (20 days, 25 days) for different target percentages (80%, 90%, 97%) but these are just variations. There is already an expectation that registrations of all sorts should be completed within a month. Customer expectations seldom remain fixed; instead, they increase with the realisation that better services can be provided. The act of improving services to meet current expectations results in more sophisticated customers who demand more. Pressure will continue to be placed on registries to reduce the times taken for registration services until there is little difference between the leaders.

Some examples of performance specifications:

Hong Kong:	<ul style="list-style-type: none"> <li>• 97% of land registrations completed (receipt to dispatch) in 20 working days</li> <li>• 97% of searches of computerised land registers to be completed in 25 minutes</li> <li>• 95% of telephone calls to help desk connected to live operator within 1 minute</li> </ul>
New South Wales	<ul style="list-style-type: none"> <li>• 95% of documents registered within 1.5 days</li> <li>• Automated search titles within 15 minutes</li> <li>• 100% of Phone Search Service requests for title search satisfied within 24 hours</li> </ul>
HM Land Registry	<ul style="list-style-type: none"> <li>• 80% of all registrations to be completed in 25 working days</li> <li>• 98% of official search applications to be handled within 2 days</li> </ul>
New Zealand	<ul style="list-style-type: none"> <li>• 90% of new titles issued within 15 working days of lodgement</li> </ul>

The revolution brought to the field of land tenure and land administration by continuing advances in information technology is also contributing to a trend towards greater standardisation. Computerisation of registries is now taken as an act of faith. Questions regarding the application of technology focus on “when” rather than “why. All major registries use computer technology in some fashion. Computerisation is moving in three stages:

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register it. This contrasts rather sharply with the six months or more we would need to register a new home purchase in the same jurisdiction, if everything went perfectly.

<sup>12</sup> For example, registration requirements being different in “title” and “deed” systems as defined in common law based jurisdictions, and the contrast between Germanic two book systems, the French derived inscription cadastre and the Dutch Roman model.

1. Creation of computerised records: development of computerised indexes, scanning of documents, and digitising of maps
2. Provision of on-line access to search the computer records.
3. Provision of on-line conveyancing and lodging of survey plans

Many jurisdictions have created computer records; some provide on-line searching capabilities, and a few are working towards on-line conveyancing.

Computerisation tends to standardise the outcome for several reasons:

- In efforts to reach the same goals (e.g., on-line transactions) registries are using the same technology. Early pioneers (e.g., Sweden) tended to develop their own major software systems. Registries now in the process of computerising use the same commercial technologies available around the world (e.g., relational database software, project management software, point-of-sale software, internet-compatible software, etc., as well as hardware and telecommunications). This is likely to continue as commercial software for electronic commerce is developed.
- Jurisdictions are usually interested in learning how others are dealing with similar issues (e.g., treating electronic signatures, spatial data infrastructure, etc.) A marketplace of ideas is emerging through increased formal and informal interaction. Good ideas from one jurisdiction are adopted and adapted by others.

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Similar responses to customer expectations and technological advances will tend to standardise the appearance of registries even in the absence of harmonised legislation. While differences may exist (e.g., in the underlying law, who can effect transactions, etc.), the “registry superstructure” or “front offices” will appear somewhat similar when accessed from a remote computer. This is the “virtual registry”: the registry perceived by users as they view their computer screens.

The first generation software for on-line registry transactions is being developed using commercial software tools but registries must still make considerable investments in systems development. The evolution of subsequent generations of software will not necessarily follow the same path. As an analogy, pioneering land administration agencies developed their own digital mapping software because, at the time, there was no such commercial software that met their specific requirements. The lack of commercial software was in part because the market had not developed. Later, most agencies decided that they were not in the software development business and switched to commercially available GIS software. As markets and technology develop, registries may similarly decide that they are not in the business of developing on-line systems. If a market emerges for commercially developed on-line registry systems, then a few

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<sup>13</sup> . This suggests that, in the case of countries which are trading partners and which face similar circumstances, registries may become somewhat standardised. Differences will exist in law, etc., but the “registry superstructure” or “front offices” will appear somewhat similar by providing electronic access, etc.

companies will probably dominate the industry. Registries will appear even more alike if they acquire their “virtual registry” software from the same company.

Some new services that the authors expect to be offered:

- Registries may obtain revenues from advertising on their web-pages (for example, the web-page might have a mortgage-broker’s advertisement that asks “Is your mortgage-rate competitive?” Searching records of older properties may bring up advertisements for roof-repairers. Links may also be provided to property professionals. Sufficient advertising could allow registries to provide a free service for searching records – thereby increasing the publicity of records.
- Registries could offer optional services to owners such as an automatic email alert of relevant information e.g., pending transactions (e.g., lodging of liens, discharges of mortgages, etc.), changes in land use regulations, and so on.

## **5 Conclusion:**

Challenges for the land tenure professions in the new millennium will be even more critical, if current trends continue of associating development with democracy and open, liberal markets. What will be needed are integrated LISs of n dimensions and N registries (water, minerals, woody plants, recreational areas, etc.) that are not now thought of as “property” subject to public scrutiny through “publicity”. This type of rapid data recovery will be necessary if we are to provide much needed interaction/transaction based international property relations.

In addition, these increasingly interactive and public databases are a foundation for a new, much needed, tool for the planet’s citizens to take on the responsibility to plan the allocation of finite resources in a way that is compatible with participatory democracy.<sup>14</sup> This is necessary to provide a secure and peaceful way of institutionalising the conflicts that are already emerging between diverse groups such as environmental clubs, ranchers, mineral exploitation companies, farmers, developers and so forth. The future will have to be based on a multi-purpose use of space. Lessons learned from land consolidation and farm land rationalisation programmes in EU are that they only work if they are participatory and competing interests are included. Luckily we are finding that, in general, good LIS data provides an acceptable starting point for all parties. With good data, the arguments move from ideological to co-existence.

Thus, our work becomes an increasingly integral part of the whole process of defining this package of rights that emerges for multi-functional use of rural space. The goals and objectives which are established by legislative processes will define both the limits and the parameters of land use planning, while the management on the basis of multiple

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<sup>14</sup> We use democracy here to refer to a process not an artifact. How local government will work as a democratic institution in a maturing world economy will be displayed in a rich variety of forms. That participatory forms of governance will continue to grow is not in doubt as long as the growth of modern information technology continues (v. our recent FAO Land Tenure Service Paper 1998).

use and sustained yield will be increasingly moved to arguments based on the nature of facts contained in our multiple N and n registries.

Although the focus of so much of our work today is on privately held real estate, we find in our member countries that very large proportion of a nation's territory includes public lands. It is just as important that these be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values. Unfortunately, only a limited number of our Member Nations have good data on just what constitutes the "public patrimony".<sup>15</sup> It is interesting to note that in the next century, if we are successful in our present efforts to register private interests, many of us will be devoted to documenting state-held land. This will be necessary if we hope to preserve and protect public lands in their natural condition; provide food and habitat for fish and wildlife and domestic animals; and provide for outdoor recreation and human occupancy and use by a growing, young urban population.

Finally, this process will have to proceed in an increasingly participatory and democratic building manner quite simply because our emerging methodologies more and more dovetail and become part of the a growing universalistic IT culture. The land tenure resource specialist can become a principal agent in allowing Government, Civil Society, Professional Expertise and Private Sector contribute to the process of good governance.<sup>16</sup>

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<sup>15</sup> That this is not a situation confined exclusively to the developing world is born out by the fact that one of the author's sister makes a good living helping the major UN donor identify and actually locate what it owns.

<sup>16</sup> The Club de Sahel (1999) has provided a brilliant presentation of the idea that we have agreed on decentralisation, but no idea how to do it! All units, Government, NGOs and individual experts all claim to have legitimacy, and more of it than the others. See also FAO 1999 for ideas on possible programmes.

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