

**Environment and Land Administration**  
- Focus on Rights, Restrictions and Responsibilities

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## **1. INTRODUCTION**

Today the accepted theoretical framework for all land administration systems is delivery of sustainable development. – the triple bottom line of economic, social, and environmental development, together with the fourth requirement of good governance. Land Administration Systems are the basis for conceptualizing rights, restrictions and responsibilities related to people, policies and places.

Property rights are normally concerned with ownership and tenure whereas restrictions usually control use and activities on land. Responsibilities relate more to a social, ethical commitment or attitude to environmental sustainability and good husbandry. This paper provides an overall understanding of the concept of land administration systems for dealing with rights, restrictions and responsibilities in future spatially enabled government.

Finally the paper presents the role of FIG with regard to building the capacity in this area and responding to the global agenda.

## **2 PROPERTY RIGHTS**

*“Civilized living in market economies is not simply due to greater prosperity  
but to the order that formalized property rights bring”*

(Hernando de Soto, 1993).

The quote is from a famous article “The Missing Ingredient” in The Economist, September 1993. The quote may also be used as an expression of the importance that international organizations, such as the UN, FAO, and Habitat attach to building cadastral systems. The World Bank has also recognized the importance of establishing appropriate land administration systems as a basis for generating economic development, social coherence and environmental sustainability. Security in land rights is seen as a basic element in this process where land is increasingly seen as a key asset.

In the Western cultures it would be hard to imagine a society without having property rights as a basic driver for development and economic growth. Property is not only economic

asset. Secure property rights provide a sense of identity and belonging that goes far beyond and underpins the values of democracy and human freedom. Historically, however, land rights evolved to give incentives for maintaining soil fertility, making land-related investments, and managing natural resources sustainably.

Therefore, property rights are normally managed well in modern economies. The main rights are ownership and long term leasehold. These rights are typically managed through the cadastral/land registration systems developed over centuries. Other rights such as easements and mortgage are often included in the registration systems.

Cadastral Systems are organized in different ways throughout the world, especially with regard to the Land Registration component. Basically, two types of systems can be identified: the Deeds System and the Title System. The differences between the two concepts relate to the cultural development and judicial setting of the country. The key difference is found in whether only the transaction is recorded (the Deeds System) or the title itself is recorded and secured (the Title System). The Deeds System is basically a register of owners focusing on “who owns what” while the Title System is a register of properties presenting “what is owned by whom”. The cultural and judicial aspects relate to whether a country is based on Roman law (Deeds Systems) or Germanic or common-Anglo law (Title Systems). This of course also relates to the history of colonization.

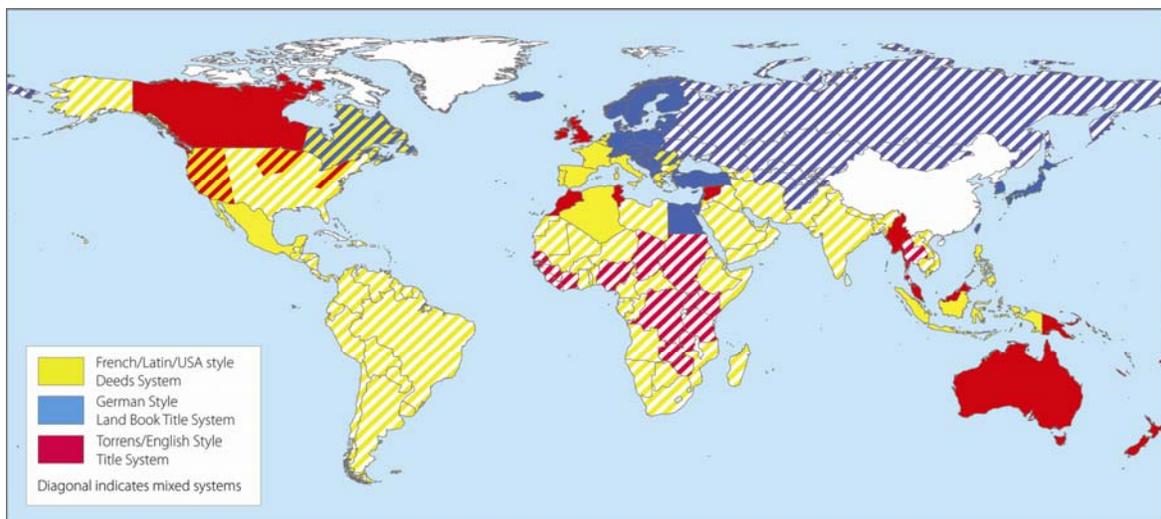


Figure 1. World map of land registration systems (adapted from Enemark 2004)

However, these legal or formal systems do not serve the millions of people whose tenures are predominantly social rather than legal. “Rights such as freehold and registered leasehold, and the conventional cadastral and land registration systems, and the way they are presently structured, can not supply security of tenure to the vast majority of the low income groups and/or deal quickly enough with the scale of urban problems. Innovative approaches need to be developed” (UN- HABITAT 2003). This should include a “scaling up approach” that include a range of steps from informal to more formalised land rights.

This process does not mean that all societies will develop into freehold tenure systems. Figure 2 shows a continuum of land rights where each step in the process can be formalised, with registered freeholds offering a stronger protection, than at earlier stages.

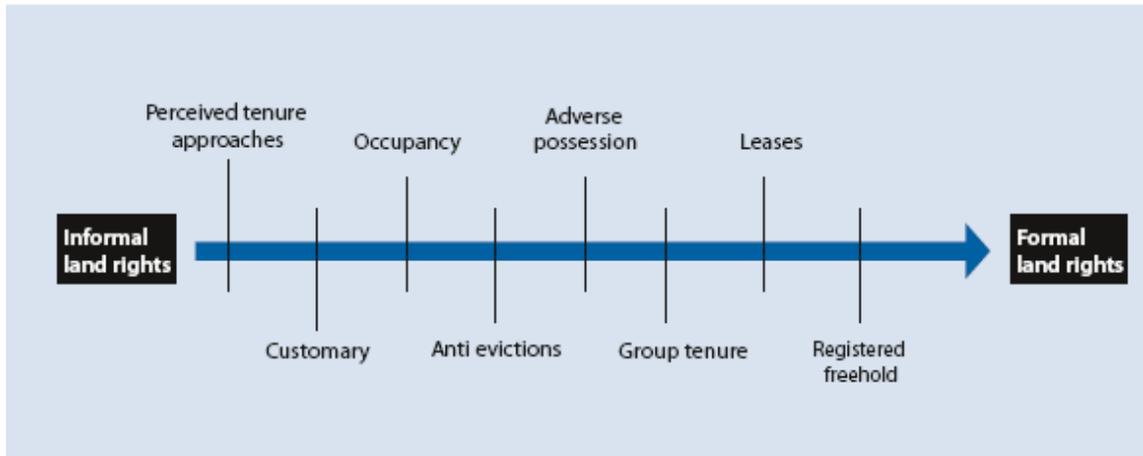


Figure 2. Continuum of land rights (UN-Habitat, 2008).

## 2.1 Comparing Cadastral Systems

A website has been established <http://www.cadastraltemplate.org> to compare cadastral systems on a worldwide basis. About 40 countries are currently included (August 2007) and the number is still increasing. The web site is established as a result of one of the objectives of Working Group 3 “Cadastral” of the PCGIAP (Permanent Committee on GIS Infrastructure for Asia and the Pacific). The cadastral template is basically a standard form to be filled out by cadastral organizations presenting their national cadastral system. The aims are to understand the role that a cadastre plays in a state or a National Spatial Data Infrastructure (NSDI), and to compare best practice as a basis for improving cadastral systems as a key component of NSDIs. The Cadastral template project is carried out in collaboration with Commission 7 “Cadastral and Land Management” of the International Federation of Surveyors (FIG), which has extensive experience in comparative cadastral studies. (Stuedler, et.al. 2004).

It is generally accepted that a good property system is a system where people in general can participate in the land market having a widespread ownership where everybody can make transactions and have access to registration. The infrastructure supporting transactions must be simple, fast, cheap, reliable, and free of corruption. And the system must provide safety for housing and business, and for capital formation. It is estimated that only 25-30 countries in the world apply to these criteria.

### **3 PROPERTY RESTRICTIONS**

Ownership and long term leasehold are the most important rights in land. The actual content of these rights may vary between countries and jurisdictions, but in general the content is well understood. Rights to land also include the rights of use. This right may be limited through public land use regulations and restrictions, sectoral land use provisions, and also various kind of private land use regulations such as easements, covenants, etc. Many land-use rights are therefore in fact restrictions that control the possible future use of the land.

Land-use planning and restrictions are becoming increasingly important as a means to ensure effective management of land-use, provide infrastructure and services, protect and improve the urban and rural environment, prevent pollution, and pursue sustainable development. Planning and regulation of land activities cross-cut tenures and the land rights they support. How these intersect is best explained by describing two conflicting points of view – the free market approach and the central planning approach.

#### **3.1 The free market versus the central planning approach**

The property rights activists, most of them influenced by private ownership viewpoints, argue that land owners should be obligated to no one and should have complete domain over their land. In this extreme position, the government opportunity to take land (eminent domain), or restrict its use (by planning systems), or even regulate how it is used (building controls) should be non-existent or highly limited. Proponents argue that planning restrictions should only be imposed after compensation for lost land development opportunities is paid (Jacobs 2007).

Throughout the European territory, another view appeared. In this, the role of a democratic government includes planning and regulating land systematically for public good purposes. Regulated planning is theoretically separated from taking private land with compensation and using it for public purposes. In these jurisdictions the historical assumption that a land owner could do anything than was not expressly forbidden by planning regulations changed into the different principle that land owners could do only what was expressly allowed, everything else being forbidden.

The tension between these two points of view is especially felt by nations seeking economic security. The question however is how to balance owners' rights with the necessity and capacity of the government to regulate land use and development for the best of the society. The answer to this is found in a country's land policy which should set a reasonable balance between the ability of land owners to manage their land and the ability of the government to provide services and regulate growth for sustainable development.

### **3.2 Environmental concerns**

Environmental policies should emphasise that economic growth can be achieved simultaneously with improvements to the environment. Industries must be able to absorb - constructively and economically - environmental considerations into their development. Policies may be based on the "polluter pays principle" which is internationally recognized. Enterprises should be located at a site causing least possible pollution and should adopt the measures necessary to prevent pollution to the greatest possible extent. These principles are the basis of recent global/national carbon trading initiatives.

Environmental policies normally include provisions to prevent and control pollution of air, earth and water, as well as provisions for noise and waste treatment. Requirements for use of the least pollution technology should also be included. These requirements can be made operational through a statutory system of prior approval/authorization applying for the establishment of all kinds of plants or activities considered as potential sources of pollution. This approval should ensure that all enterprises meet a number of environmental and technological standards and so pollute soil, air and water as little as possible. Environmental policies may also include provisions for waste water treatment to be managed through the guidelines that safeguard the quality of watercourses.

### **3.3 Informal development**

Informal development may occur in various forms such as squatting where vacant state-owned or private land is occupied and used illegally for housing or any construction works without having formal permission from the planning or building authorities.

There is no simple solution to the problems of preventing and legalising informal development. The problems relate mainly to the national level of economic wealth in combination with the level of social and economic equity in society, while the solutions relate to the level of consistent land policies, good governance, and well established institutions. Guidance for solutions can be found in the concept of integrated land-use management as presented below with a focus on the means of decentralisation, comprehensive planning, and public participation.

Although some occurrences of illegal development, such as in post conflict situations, may be difficult to stop, many other forms of illegal development could be significantly reduced through government interventions supported by the citizens. Underpinning this intervention is the concept of integrated land management as a fundamental means to support sustainable development, and at the same time, prevent and legalise informal development. (Enemark and McLaren, 2008).

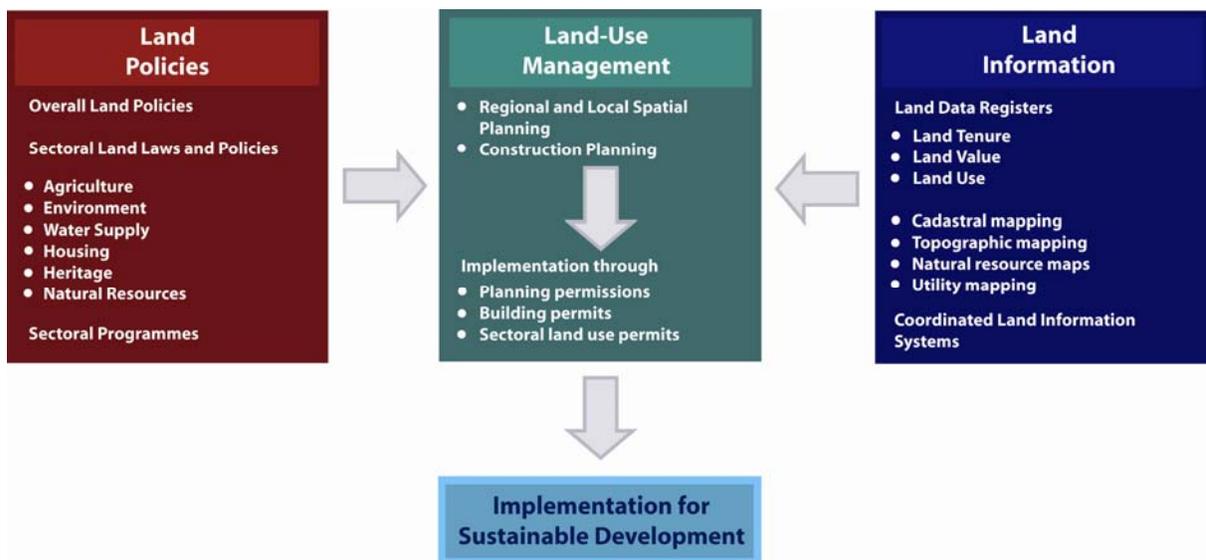
### **3.4 Integrated Land-Use Management**

Integrated land-use management is based on land policies laid down in the overall land policy laws including the cadastral and land registration legislation and planning and building legislation. These laws identify the institutional principles and procedures for the

areas of land and property registration, land-use planning, and land development. More specific land policies are laid down in the sectoral land laws within areas such as agriculture, forestry, housing, natural resources, environmental protection, water supply, heritage, and so on. These laws identify the objectives within the various areas and the institutional arrangements to achieve these objectives through permit procedures, information policies, dispute handling, and so on. The various areas produce sectoral programmes that include the collection of relevant information for decision making within each area. These programmes feed into the comprehensive spatial planning carried out at national, state/regional and local levels.

Importantly, a mature system of comprehensive planning control needs to be based on appropriate and updated land use data systems, especially the cadastral register, the land book, the property valuation register, the building and dwelling register, etc. These registers need to be organized to form a network of integrated subsystems connected to the cadastral and topographic maps to form a national spatial data infrastructure for the natural and built environment.

In the land-use management system (the planning control system) the various sectoral interests should be balanced against the overall development objectives for a given location and thereby form the basis for regulation of future land-use through planning permissions, building permits and sectoral land use permits according to the various land-use laws. These decisions are based on the relevant land use data and thereby reflect the spatial consequences for the land as well as society. In principle it can then be ensured that implementation will happen in support of sustainable development.



**Figure 3.** Integrated land-use management for sustainable development (Enemark, 2004).

#### **4. PROPERTY RESPONSIBILITIES**

Property responsibilities relate to a more social, ethical commitment or attitude to environmental sustainability and good husbandry. Individuals and other actors are supposed to treat land and property in a way that conform to cultural traditions and ways of good ethical behaviour. This relates to what is accepted both legally and socially.

Therefore, the systems for managing the use of land vary throughout the world according to historical development and cultural traditions. More generally, the human kind to relationship is to some extent determined by the cultural and administrative development of the country or jurisdiction.

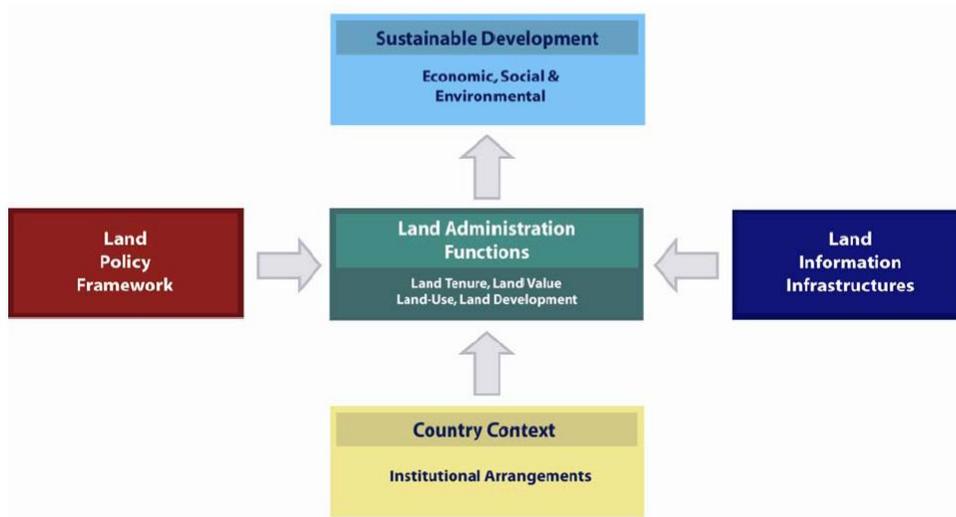
This relates to cultural dimensions as described by the Dutch scientist Gert Hofstede, especially the dimensions of: *Uncertainty avoidance*, that is the preference of structured situations over unstructured or flexible ones; and *Power distance*, that is the degree of inequality among people accepted by the population (Gert Hofstede, 2001). These cultural dimensions determine the social and ethical behaviour of people also in relation to the way land can be hold and used within a given culture. Systems of land tenure and land-use control therefore vary throughout the world according to such cultural differences.

Social responsibilities of land owners have a long heritage in Europe. In Germany, for example, the Constitution is insisting on the land owner's social role. In general Europe is taking a comprehensive and holistic approach to land management by building integrated information and administration systems. Other regions in the world such as Australia creates separate commodities out of land, using the concept of "unbundling land rights", and is then adapting the land administration systems to accommodate this trading of rights without any national approach (Williamson and Wallace, 2007).

#### **5. THE LAND MANAGEMENT PARADIGM**

Land management underpins distribution and management of a key asset of any society namely its land. For western democracies, with their highly geared economies, land management is a key activity of both government and the private sector. Land management, and especially the central land administration component, aim to deliver efficient land markets and effective management of the use of t land in support of economic, social, and environmental sustainability.

The land management paradigm as illustration in figure 3 below allows everyone to understand the role of the land administration functions (land tenure, land value, land use, and land development) and how land administration institutions relate to the historical circumstances of a country and its policy decisions. Importantly, the paradigm provides a framework to facilitate the processes of integrating new needs into traditionally organised systems without disturbing the fundamental security these systems provide.



**Figure 4.** The land management paradigm (Enemark, 2004)

A Land Administration System designed in this way forms a backbone for society and is essential for good governance because it delivers detailed information and reliable administration of land from the basic foundational level of individual land parcels to the national level of policy implementation. And the system includes all rights, restrictions and responsibilities.

## 6. SPATIALLY ENABLED GOVERNMENT

Spatially enabled government is achieved when governments use **place** as the key means of organising their activities in addition to information, and when location and spatial information are available to citizens and businesses to encourage creativity.

Google Earth is good example of providing user friendly information in a very accessible way. We should consider the option where spatial data from Google Earth are merged with built and natural environment data. This unleashes the power of both technologies in relation to emergency response, taxation assessment, environmental monitoring and conservation, economic planning and assessment, social services planning, infrastructure planning, etc. This also include designing and implementing a suitable service oriented IT-architecture for organising spatial information that can improve the communication between administrative systems and also establish more reliable data based on the use of the original data instead of copies. Spatial enablement offers opportunities for visualisation, scalability, and user functionalities:

This is related to institutional challenges with a range of stakeholder interests. This includes Ministries/Departments such as: Justice; Taxation; Planning; Environment; Transport;

Agriculture; Housing; Interior (regional and local authorities); Utilities; and civil society interests such as businesses and citizens. Creating awareness of the benefits of developing a shared platform for Integrated Land Information Management takes time and patience. The Mapping/Cadastral Agencies have a key role to play in this regard. The technical core of Spatially Enabling Government is the spatially enabled cadastre.

**6.1 Significance of the Cadastre**

The land management paradigm makes a national cadastre the engine of the entire LAS, underpinning the country’s capacity to deliver sustainable development. The role of the cadastre as the engine of LAS is neutral in terms of the historical development of any national system, though systems based on the German and Torrens approaches, are much more easily focused on land management than systems based on the French/Latin approach.

The cadastre as an engine of LAS is shown diagrammatically in Figure 5. The diagram highlights the usefulness of the large scale cadastral map as a tool by exposing its power as the representation of the human scale of land use and how people are connected to their land. The digital cadastral representation of the human scale of the built environment, and the cognitive understanding of land use patterns in peoples’ farms, businesses, homes, and other developments, then form the core information sets that facilitate a country building an overall administrative framework to deliver sustainable development in a country.

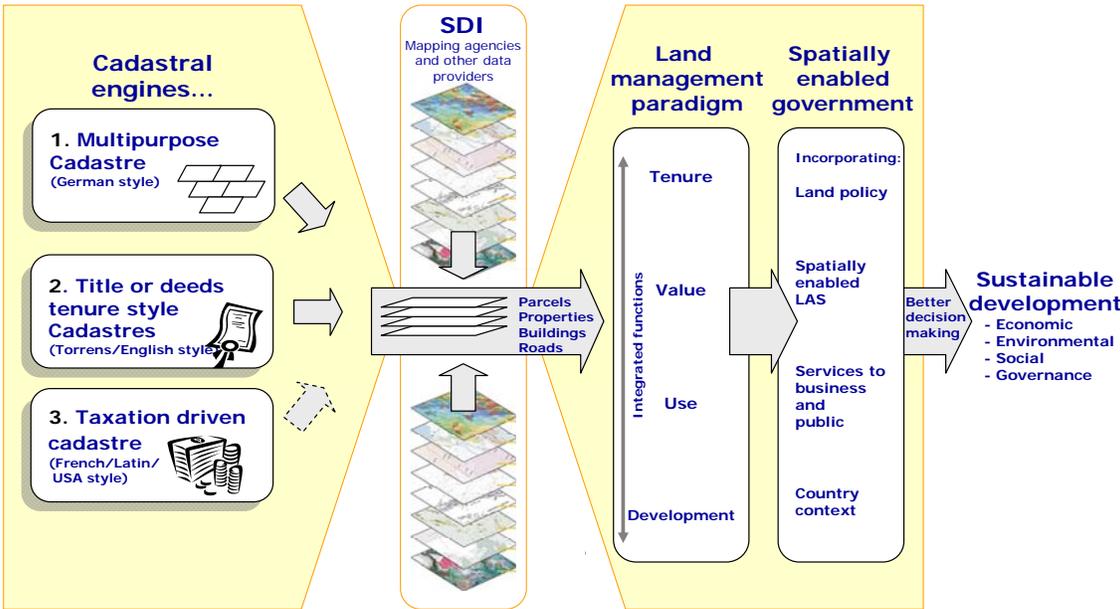


Figure 5. Significance of the Cadastre (Williamson and Wallace, 2007)

The diagram demonstrates that the cadastral information layer cannot be replaced by a different spatial information layer derived from geographic information systems (GIS). The unique cadastral capacity is to identify a parcel of land both on the ground and in the

system in terms that all stakeholders can relate to, typically an address plus a systematically generated identifier (given addresses are often duplicated or are otherwise imprecise). The core cadastral information of parcels, properties and buildings, and in many cases legal roads, thus becomes the core of SDI information, feeding into utility infrastructure, hydrological, vegetation, topographical, images, and dozens of other datasets.

## 6.2 Good governance

Governance refers to the manner in which power is exercised by governments in managing a country's social, economic, and spatial resources. It simply means: the process of decision-making and the process by which decisions are implemented. This indicates that government is just one of the actors in governance. The concept of governance includes formal as well as informal actors involved in decision-making and implementation of decisions made, and the formal and informal structures that have been set in place to arrive at and implement the decision.

Good governance is a qualitative term or an ideal which may be difficult to achieve. The term includes a number of characteristics e.g. as identified in the UN-Habitat Global Campaign on Urban Governance. The characteristics or norms are as follows (adapted from FAO, 2007):

- *Sustainable and locally responsive:* It balances the economic, social, and environmental needs of present and future generations, and locates its service provision at the closest level to citizens.
- *Legitimate and equitable:* It has been endorsed by society through democratic processes and deals fairly and impartially with individuals and groups providing non-discriminatory access to services.
- *Efficient, effective and competent:* It formulates policy and implements it efficiently by delivering services of high quality
- *Transparent, accountable and predictable:* It is open and demonstrates stewardship by responding to questioning and providing decisions in accordance with rules and regulations.
- *Participatory and providing security and stability:* It enables citizens to participate in government and provides security of livelihoods, freedom from crime and intolerance.
- *Dedicated to integrity:* Officials perform their duties without bribe and give independent advice and judgements, and respects confidentiality. There is a clear separation between private interests of officials and politicians and the affairs of government.

Once the adjective “good” is added, a normative debate begins. In any case, almost all kind of government includes a spatial component. In other words: Good governance and sustainable development is not attainable without sound land administration or - more broadly – sound land management.

## 7. THE ROLE OF FIG

FIG is an UN recognised NGO representing the surveying profession in about 100 countries throughout the world. FIG has adopted an overall theme for the next period of office (2007-2010) entitled “*Building the Capacity*”. This theme applies to the need for capacity building in developing countries to meet the challenges of fighting poverty and developing a basis for a sustainable future, and, at the same time, capacity is needed in developed countries to meet the challenges of the future in terms of institutional and organisational development in the areas of surveying and land administration.

In general, FIG will strive to enhance the global standing of the profession through both education and practice, increase political relations both at national and international level, help eradicating poverty, promote democratisation, and facilitate economic, social and environmental sustainability.

FIG can facilitate support of capacity development in three ways:

- **Professional development:** FIG provides a global forum for discussion and exchange of experiences and new developments between member countries and between individual professionals in the broad areas of surveying and mapping, spatial information management, and land management. This relates to the FIG annual conferences, the FIG regional conferences, and the work of the ten technical commissions within their working groups and commission seminars. This global forum offers opportunities to take part in the development of many aspects of surveying practice and the various disciplines including ethics, standards, education and training, and a whole range of professional areas.
- **Institutional development:** FIG supports building the capacity of national mapping and cadastral agencies, national surveying associations and survey companies to meet the challenges of the future. FIG also provides institutional support to individual member countries or regions with regard to developing the basic capacity in terms of educational programs and professional organisations. The professional organisations must include the basic mechanisms for professional development including standards, ethics and professional code of conduct for serving the clients.
- **Global development:** FIG also provides a global forum for institutional development through cooperation with international NGO’s such as the United Nations Agencies (UNDP, UNEP, FAO, HABITAT), the World Bank, and sister organisations (GSDI, IAG, ICA, IHO, and ISPRS). The cooperation includes a whole range of activities such as joint projects (e.g. The Bathurst Declaration, The Aguascalientes Statement), and joint policy making e.g. through round tables. This should lead to joint efforts of addressing topical issues on the international political agenda, such as reduction of poverty and enforcement of sustainable development.

FIG, this way, plays a strong role in improving the capacity to design, build and manage surveying and land administration systems that incorporate sustainable land policies and efficient spatial data infrastructures.

## **7.1 The Global Agenda**

FIG is strongly committed to the global agenda as presented in the Millennium Development Goals (MDGs) (UN, 2000). The surveyors throughout the world play a key role in attaining the MDGs through their professional functions in support of an efficient land market and effective land-use management. These functions underpin development and innovation for social justice, economic growth, and environmental sustainability. FIG is also committed to the UN-Habitat agenda around the Global Land Tool Network (GLTN) that aims to facilitate the attainment of the MDGs through improved land management and tenure tools for poverty alleviation and the improvement of the livelihoods for the poor (UN-Habitat, 2006).

### **The Millennium Development Goals**

**Goal 1: Eradicate extreme poverty and hunger**

**Goal 2: Achieve universal primary education**

**Goal 3: Promote gender equality and empower women**

**Goal 4: Reduce child mortality**

**Goal 5: Improve maternal health**

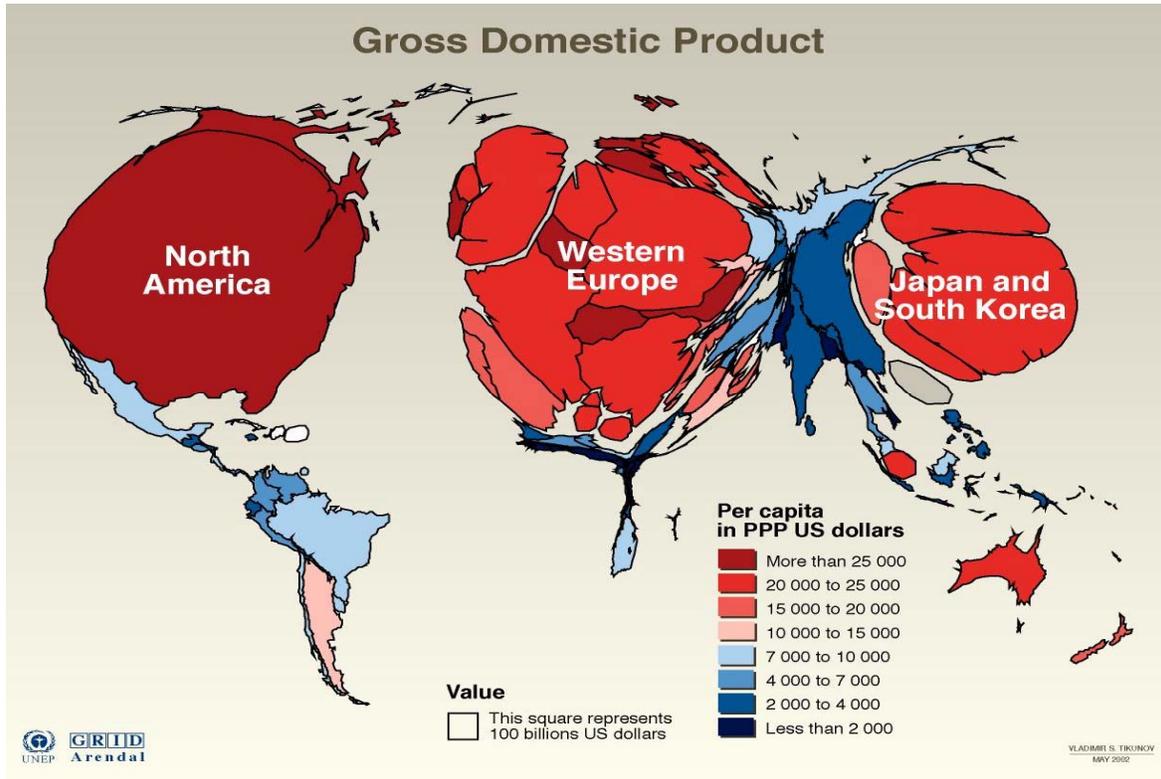
**Goal 6: Combat HIV/AIDS, malaria and other diseases**

**Goal 7: Ensure environmental sustainability**

**Goal 8: Develop a Global Partnership for Development**

The eight Millennium Development Goals (MDGs) form a blueprint agreed to by all the world's countries and the world's leading development institutions. The first seven goals are mutually reinforcing and are directed at reducing poverty in all its forms. The last goal - global partnership for development - is about the means to achieve the first seven. The MDGs represent a wider concept or a vision for the future, where the contribution of the global surveying community is central and vital. This relates to the areas of providing the relevant geographic information in terms of mapping and databases of the built and natural environment, and also providing secure tenure systems, systems for land valuation, land use management and land development. The work of the surveyors forms a kind of "backbone" in society that supports social justice, economic growth, and environmental sustainability. These aspects are all key components within the MDGs.

The global challenge can be displayed through a map of the world (figure 4) using the Gross Domestic Product as the scale of showing the territory size, In surveying terms, the real challenge of the global agenda is about bringing this map back to scale.



**Figure 6.** Map of the world where the territory size is shown based on the Gross Domestic Product. (Source: UNEP).

In a global perspective the areas of surveying and land administration are basically about *people*, *politics*, and *places*. It is about *people* in terms human rights, engagement and dignity; it is about *politics* in terms of land policies and good government; and it is about *places* in terms of shelter, land and natural resources.

In facing the global agenda the role of FIG – the global surveying community - is threefold: (i) to explain the role of the surveying profession and the surveying disciplines in terms of their contribution to the MDGs. Such statements should also make the importance of the surveying profession disciplines better understood in a wider political context; (ii) to develop and disseminate knowledge, policies and methods towards achieving and implementing the MDGs - a number of FIG publications have already made significant contributions in this regard; and (iii) to work closely with the UN agencies and the World Bank in contributing to the implementation of the MDGs. An outcome of these efforts relates to cooperation with UN-Habitat in developing a model for providing secure social tenure for the poorest.

FIG already shares this global responsibility and has now established a focused partnership with both the World Bank and UN-Habitat to deal with these challenges. An outcome in support of the UN-Habitat Global Land Tools Network should be ready by o be presented at the World Urban Forum in Nanjing, October 2008. This will include a special focus on developing a model for providing secure social tenure for the poorest. Another outcome will be in the areas of capacity building and good governance in land administration in support of the MDGs to be presented at a joint FIG/WB high profile conference in Washington DC in March 2009.

## **8. FINAL REMARKS**

No nation can build land management institutions without thinking about integration of activities, policies, and approaches. Technology opportunities provide additional motivation. Careful management of land related activities on the ground are crucial for delivery of sustainability.

Land administration systems, in principle, reflect the social relationship between people and land recognized by any particular jurisdiction or state. Such a system is not just a GIS. On the other hand, Land Administration Systems are not an end in itself but facilitate the implementation of the land policies within the context of a wider national land management framework.

Land administration activities are, not just about technical or administrative processes. The activities are basically political and reflect the accepted social concepts concerning people, rights, and land objects with regard to land tenure, land markets, land taxation, land-use control, land development, and environmental management.

Land administration systems therefore need high-level political support and recognition.

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