



**AALBORG UNIVERSITY**  
DENMARK

**Aalborg Universitet**

## **Underpinning Land Management**

*a major challenge for the global surveying profession*

Enemark, Stig

*Publication date:*  
2008

*Document Version*  
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*

Enemark, S. (2008). *Underpinning Land Management: a major challenge for the global surveying profession*. Paper presented at International Congress on Geomatic & Surveying Engineering, Valencia, Spain.

### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

### **Take down policy**

If you believe that this document breaches copyright please contact us at [vbn@aub.aau.dk](mailto:vbn@aub.aau.dk) providing details, and we will remove access to the work immediately and investigate your claim.

## **Underpinning Land Management**

- A major challenge for the global surveying profession.

**Prof. Stig Enemark**  
**FIG President**  
**Aalborg University, Denmark**

### **1. INTRODUCTION**

Arguably sound land management is the key to achieve sustainable development and to support the global agenda set by adoption of the Millennium Development Goals.

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.

Deeds registration is rooted in the Roman culture and is, therefore, common in Latin cultures in Europe (France, Spain, Italy, Benelux), in Latin America, and in parts of Asia and Africa who have been influenced by these cultures. The concept is also used in most of the United States but was derived from English deeds conveyancing. In the US these systems are now diversified, locally managed, and supported by private title insurance. Deeds Systems is found in different forms, where the role of the cadastral identification as well as the role of the surveyors varies significantly.

Title registration has its origin in the German culture and is found in the central European countries (Germany, Austria, Switzerland). Different versions of the German system are found in the Eastern European and the Nordic countries. The versions relate to the use of the property concept and the organization of the cadastral process including the use and the role of private licensed surveyors. A special version of the Title System is found in UK, where the concept of general boundaries is used to identify the land parcels on the large-scale topographic map series. Title registration is found in a third variant: the Torrens system (developed by Sir Robert Torrens) and introduced in Australia by mid 1800's to serve the need of securing land rights in the “new world”. The Torrens Systems is implemented in Australia, New Zealand, Western states of Canada, and some countries in Asia and Africa.

The systems in Latin America, Africa and Asia are often mixed and rather incomplete in terms of content as well as coverage. Furthermore, some land rights cannot be recorded in Western judicial systems due to the nature of the rights. This relates to the traditional land rights on the African continent known as “customary rights”, and also the “indigenous land rights” related to the indigenous people in the American and Australian parts of the world. However, it is a misunderstanding that location of rights can only be done by defining a cadastral parcel and by a precise boundary survey (Molen, 2001). The formalized western land registration systems are basically concerned with identification of legal rights in support of an efficient the land market, while the systems do not adequately address the more informal and indigenous rights.

## 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 “Cadastre” 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 cadastres as a key component of NSDIs. The Cadastral template project is carried out in collaboration with Commission 7 “Cadastre and Land Management” of the International Federation of Surveyors (FIG), which has extensive experience in comparative cadastral studies. (Stuedler, et.al. 2004).



*Figure 1. The Cadastral Template provides a worldwide Comparison of Cadastral Systems*

### **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**

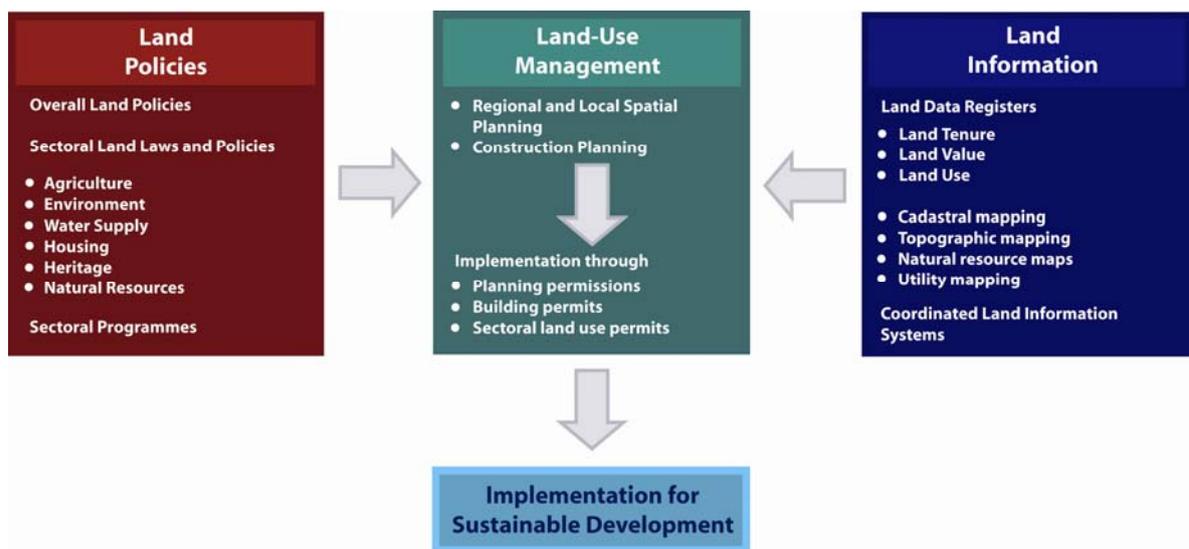
The property rights activists, most of them influenced by private ownership viewpoints, argue that land owners should be obligated to no one and should have complete domain over their land. In this extreme position, the government opportunity to take land (eminent domain), or restrict its use (by planning 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 that 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 Integrated Land-Use Management

Integrated land-use management is based on land policies laid down in the overall land policy laws such as the Cadastral/Land Registration Act; and The Planning/Building Act. These laws identify the institutional principles and procedures for 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, etc. These laws identify the objectives within the various areas and the institutional arrangements to achieve these objectives through permit procedures etc. The various areas produce sectoral programmes that include the collection of relevant information for decision making within each area. These programmes should feed into the comprehensive spatial planning carried out at national, state/regional and local level and supported by appropriate and updated land information systems. Such an integrated system of Land-Use Management for Sustainable Development is shown in figure 2 below.



*Figure 2. Integrated land-use management for sustainable development (Enemark, 2004).*

In the Land-Use Management System (the Planning Control System) the various sectoral interests are 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 the people. In principle it can then be ensured that implementation will happen in support of sustainable development.

#### **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.

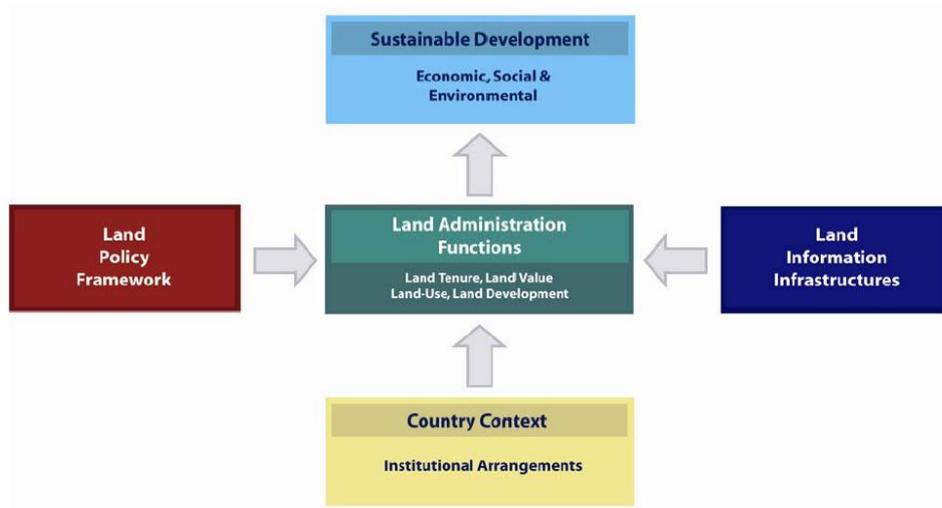
This relates to cultural dimensions as described by the Dutch scientist Gert Hofstede, especially the dimensions of: *Uncertainty avoidance*, that is the preference of structured situations over unstructured or flexible ones; and *Power distance*, that is the degree of inequality among people accepted 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 3. The land management paradigm (Enemark et al., 2005)*

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:

- Attachment of information to images of the parcel and property
- Identification of “the place” in ways that are understandable by non-technical people (Google Earth)
- Capacity of businesses and citizens to manipulate the information through service oriented IT- architecture.
- Integration of government information systems
- Provision of seamless information to institutions and government
- Ultimately managing information through spatially enabled systems rather than databases.

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.

## 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, 2006b).

### **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**

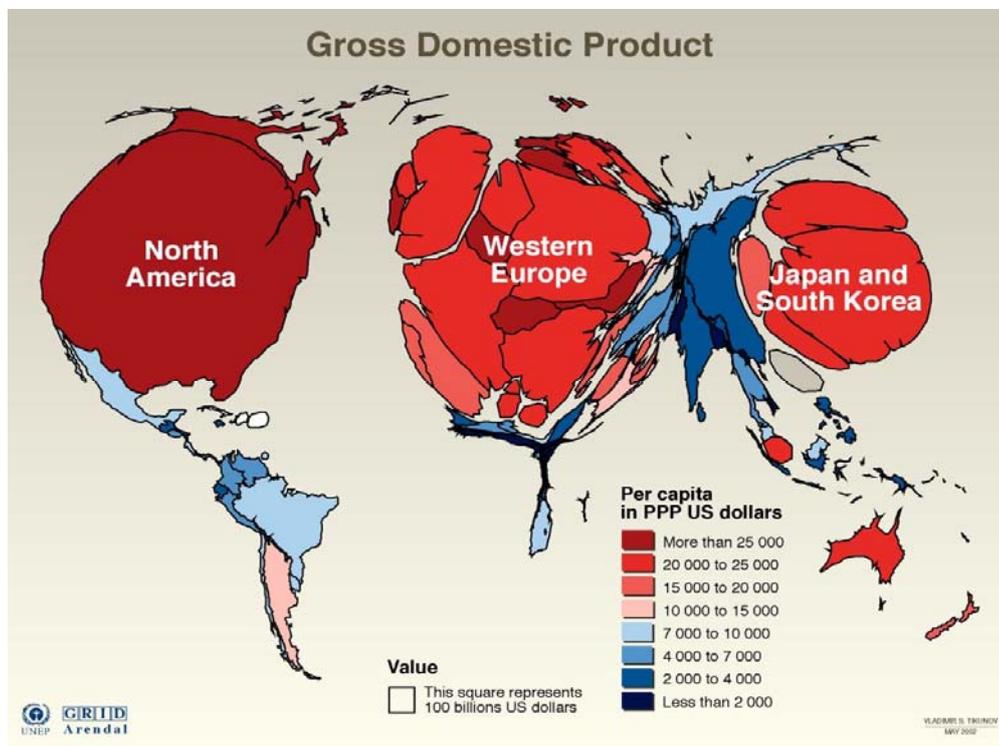
**Goal 6: Combat HIV/AIDS, malaria and other diseases**

**Goal 7: Ensure environmental sustainability**

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

The MDGs represent a wider concept or a vision for the future, where the contribution of the 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; providing secure tenure systems; and 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.



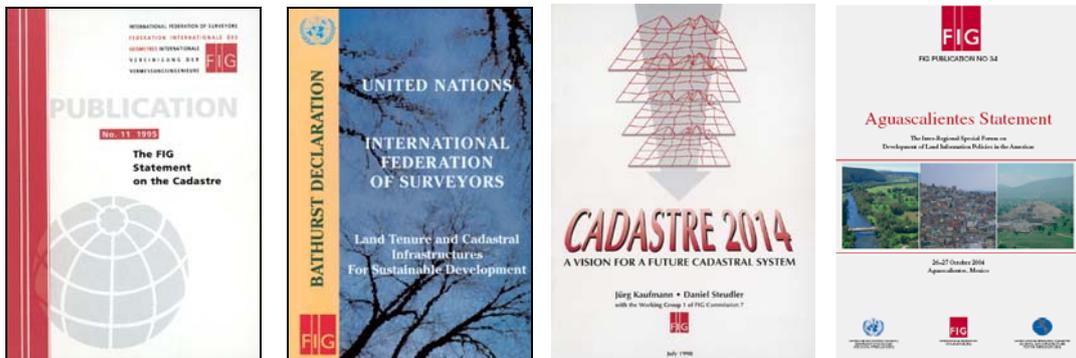
*Figure 4. Map of the world where the territory size is shown based on the Gross Domestic Product. (Source: UNEP).*

In a global perspective the areas of surveying and land administration are basically about:

- **People**, in terms human rights, engagement and dignity;
- **Politics**, in terms of land policies and good government; and
- **Places**, in terms of shelter, land and natural resources.

To complete the picture another “P” should be added namely **Power** in terms of providing equity and legal empowerment of the poor. By taking this approach FIG will pursue sustainable development in both an economic, social, governmental, and environmental sense. The role of FIG in this regard is threefold:

- To explain the role of the surveying profession and the surveying disciplines in terms of their contribution to the MDGs.
- 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. Examples of such publication are shown in figure 5. All publications are available on-line at the FIG website: [www.fig.net/publications](http://www.fig.net/publications)
- To work closely with the UN agencies and the World Bank in merging our efforts of contributing to the implementation of the MDGs.



*Figure 5. Examples of FIG publications contributing to the global agenda*

The MDGs serve as a visionary challenge to help garner new energies and resources for the development agenda, with a focus on outcomes. The agenda includes the basic elements for a new global partnership. 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 the second half of 2008 to 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 November 2008.

### 7.3 Pro poor land tenure systems

Today there are about 1 billion slum dwellers in the world. UN-Habitat estimates that the slum population will reach 1.4 billion by 2020 if no remedial action is taken. The city authorities view most people living in slums as illegal. Because of this, cities do not plan for or manage slums, and the people in them are overlooked and excluded. Conventional

cadastral and land registration systems cannot supply security of tenure to the vast majority of the low income groups and/or deal quickly enough with the scale of urban problems (un-Habitat, 2006a)

A solution to this problem may be found in the so called Social Tenure Domain Model (STDM) originally developed as the Core Cadastral Domain Model (CCDM). The key issue here is that, in traditional cadastral systems there is often an insufficient focus on pro poor technical and legal tools. For that purpose FIG will facilitate development and testing of a prototype for such a STDM as a tool to deal with the kind of social tenure that exist in informal settlements (and also in areas based on customary tenure) that cannot be accommodated in traditional cadastral systems (Augustinus, et.al., 2006).



**Figure 6.** *Informal settlement Kibera in Nairobi, Kenya covers 150 ha for 1 mill+ slum dwellers.*

Traditional cadastral and land registration systems deal with identification of properties and land parcels as a basis for securing legal rights such as title, leasehold, and easements. The STDM attempts to be able to deal more generally with the relation between objects (that may be a parcel, construction work, or a natural asset), subjects (that may be a person, group of people, or groups of groups), and the social tenure (including all kind of rights, restrictions and responsibilities) that is established between the object and subject. Such a

system, provided as open source software, should be available as a tool for managing the range of tenures found in informal settlement and be manageable for the local communities as well as public authorities.

## **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.

As stated in the introduction, 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.

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.

## **REFERENCES**

Augustinus, C. et.al. (2006): Social tenure Model – requirements from the Perspective of Pro-Poor Land Management. Proceedings of the 5<sup>th</sup> FIG Regional Conference for Africa, Accra, Ghana, 8-11 March 2006. [http://www.fig.net/pub/accra/papers/ps03/ps03\\_01\\_augustinus.pdf](http://www.fig.net/pub/accra/papers/ps03/ps03_01_augustinus.pdf)

Enemark, S. (2004): Building Land Information Policies. Proceedings of Special Forum on Building Land Information Policies in the Americas. Aguascalientes, Mexico, 26-27 October 2004. [http://www.fig.net/pub/mexico/papers\\_eng/ts2\\_enemark\\_eng.pdf](http://www.fig.net/pub/mexico/papers_eng/ts2_enemark_eng.pdf)

Enemark, S., Williamson, I., and Wallace, J. (2005) Building Modern Land Administration Systems in Developed Economies. Journal of Spatial Science, Perth, Australia, Vol. 50, No. 2, pp 51-68.

Molen, Paul van der (2001): The Importance of the Institutional Context for Sound Cadastral Information Management for Sustainable Land Policy. Proceedings of FIG International Conference on Spatial information for Sustainable Development, Nairobi, Kenya, 2-5 October 2005. <http://www.fig.net/pub/proceedings/nairobi/vandermolen-TS7-4.pdf>

Hofstede, G. (2001): Culture's Consequences: Comparing Values, Behaviours, Institutions and Organizations Across Nations, 2nd Edition, Thousand Oaks CA: Sage Publications.

Stuedler, D., Williamson, I., Rajabifard, A., and Enemark, S.(2004): The Cadastral Template Project. Proceedings of FIG Working Week 2004, Athens, 22-27 May. 15 p.  
[http://www.fig.net/pub/athens/papers/ts01/ts01\\_2\\_stuedler\\_et\\_al.pdf](http://www.fig.net/pub/athens/papers/ts01/ts01_2_stuedler_et_al.pdf)

UN (2000): United Nations Millennium Declaration. Millennium Summit, New York, 6-8 September 2000. UN, New York. <http://www.un.org/millennium/declaration/ares552e.pdf>

UN-Habitat (2006a): State of the World's Cities 2006/7. UN-Habitat, Nairobi. ISBN: 92/1/131811-4, <http://www.unhabitat.org/pmss/getPage.asp?page=bookView&book=2101>

UN-Habitat (2006b): Global land Tool Network: Themes and Issues.  
[http://www.unhabitat.org/downloads/docs/3484\\_47014\\_GLTN%20themes%20and%20issues\\_1.pdf](http://www.unhabitat.org/downloads/docs/3484_47014_GLTN%20themes%20and%20issues_1.pdf)

## **BIOGRAPHICAL NOTES**

**Stig Enemark** is President of the International Federation of Surveyors, FIG. He is Professor in Land Management and Problem Based Learning at Aalborg University, Denmark, where he was Head of the School of Surveying and Planning 1991-2005. He is Master of Science in Surveying, Planning and Land Management and he obtained his license for cadastral surveying in 1970. He worked for ten years as a consultant surveyor in private practice. He was President of the Danish Association of Chartered Surveyors (DdL) 2003-2006 and he is an Honorary Member of DdL. He was Chairman of Commission 2 (Professional Education) of the International Federation of Surveyors (FIG) 1994-98, and he is an Honorary Member of FIG. He has undertaken consultancies for the World Bank and the European Union especially in Eastern Europe and Sub Saharan Africa. He has more than 250 publications to his credit, and he has presented invited papers to more than 60 international conferences. For further information see

<http://www.land.aau.dk/~enemark>

## **CONTACTS**

Stig Enemark  
FIG President  
Professor in Land Management  
Aalborg University, 11 Fibigerstrede  
9220 Aalborg, DENMARK  
Tel. + 45 9635 8344, Fax + 45 9815 6541  
Email: [enemark@land.aau.dk](mailto:enemark@land.aau.dk)  
Website: [www.land.aau.dk/~enemark](http://www.land.aau.dk/~enemark)