



**AALBORG UNIVERSITY**  
DENMARK

**Aalborg Universitet**

## **Land management in support of the global agenda**

Enemark, Stig

*Publication date:*  
2007

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

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*

Enemark, S. (2007). *Land management in support of the global agenda*. Paper presented at International Congress GEOMATICA 2007 : Geomatics for the development, Havana, Cuba.  
[http://www.fig.net/council/enemark\\_papers/enemark\\_havana\\_paper.pdf](http://www.fig.net/council/enemark_papers/enemark_havana_paper.pdf)

### **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.

## **LAND MANAGEMENT IN SUPPORT OF THE GLOBAL AGENDA**

Prof. Stig Enemark

**FIG President**

Aalborg University, Denmark

Email: [enemark@land.aau.dk](mailto:enemark@land.aau.dk)

### **1. INTRODUCTION**

The areas of surveying and land administration are basically about people, politics and places. It is about human rights, engagement and dignity; policies and good government; and places in term of shelter, land and natural resources. By taking this approach FIG pursue sustainable development in both an economic, social, governmental, and environmental sense.

The areas of surveying and mapping, spatial information management, cadastre and land management provide a basic platform for poverty eradication and development. This is why FIG is deeply committed to achieving the Millennium Development Goals (MDGs).

The eight Millennium Development Goals form a blueprint agreed to by all the world's countries and all the world's leading development institutions. The United Nations Millennium Summit, September 2000, established a time bound (2015) and measurable goals and targets for combating poverty, hunger, disease, illiteracy, environmental degradation and discrimination of women. These goals are now placed at the heart of the global agenda. The Summit's Millennium Declaration also outlined a wide range of commitments in human rights, good governance, and democracy.

The Millennium Development Goals (MDGs) is a powerful concept towards development, security and human rights for all. Surveyors play a key role in this regard in terms of providing some of the fundamental preconditions for development. These preconditions are also embedded in the Millennium Declaration and spelled out in the targets and indicators for achieving the MDGs.

Land management is the process by which the resources of land are put into good effect. Land management encompasses all activities associated with the management of land and natural resources that are required to achieve sustainable development. Land Administration Systems are institutional frameworks complicated by the tasks they must perform, by national cultural, political and judicial settings, and by technology. This paper facilitates an overall understanding of land management in support of the global agenda.

## 2. THE EIGHT MILLENNIUM DEVELOPMENT GOALS

The relevant material on the Millennium Development Goals is available at the UN website: <http://www.un.org/millenniumgoals/goals.html>

### The UN Millennium Development Goals

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

- Reduce by half the proportion of people living on less than a dollar a day
- Reduce by half the proportion of people who suffer from hunger

**Goal 2: Achieve universal primary education**

- Ensure that all boys and girls complete a full course of primary education

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

- Eliminate gender disparity in primary and secondary education preferably by 2005, and at all levels by 2015

**Goal 4: Reduce Child mortality**

- Reduce by two thirds the mortality rate among children under five

**Goal 5: Improve maternal health**

- Reduce by three quarters the maternal mortality ratio

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

- Halt and begin to reverse the spread of HIV/AIDS
- Halt and begin to reverse the incidence of malaria and other major diseases

**Goal 7: Ensure environmental sustainability**

- Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources
- Reduce by half the proportion of people without sustainable access to safe drinking water
- Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020

**Goal 8: Develop a global partnership for development**

- Develop further an open trading and financial system that is rule-based, predictable and non-discriminatory, includes a commitment to good governance, development and poverty reduction— nationally and internationally
- Address the least developed countries' special needs. This includes tariff- and quota-free access for their exports; enhanced debt relief for heavily indebted poor countries; cancellation of official bilateral debt; and more generous official development assistance for countries committed to poverty reduction
- Address the special needs of landlocked and small island developing States
- Deal comprehensively with developing countries' debt problems through national and international measures to make debt sustainable in the long term
- In cooperation with the developing countries, develop decent and productive work for youth
- In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries
- In cooperation with the private sector, make available the benefits of new technologies— especially information and communications technologies

It is obvious that the MDGs address some of the most fundamental issues of our times.

It is also obvious that only a few of these issues relate to the work and the world of the surveying community. But in any case, as stated by Kofi Annan (UN, 2005c) “We will not enjoy development without security, we will not enjoy security without development, and we will not enjoy either without respect for human rights. Unless all these causes are advanced, none will succeed.” And FIG is very into the area of development

In the report “In larger freedom: towards development, security and human rights for all” (UN, 2005c) UN Secretary-General Kofi Annan presents the human vision of the future world in terms of having:

- Freedom for Want
- Freedom for fear
- Freedom to live in Dignity

In this perspective 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 is about infrastructure investment both in physical and technical terms, which make other decisions better and more reliable.

FIG – as an international NGO recognized by the UN – should make the world understand the important contribution of surveyors in this regard and cooperate with the UN agencies such as UNDP, UN-HABITAT, FAO, and the World Bank to optimize the outcome of our common efforts. FIG should identify their role in this process and spell out the areas where the global surveying and geospatial profession can make a significant contribution. Issues such as tenure security, pro-poor land management, and good governance in land administration are all key issues to be advocated in the process of reaching the goals. Measures such as capacity assessment, institutional development and human resource development are all key tools in this regard.

### **3. THE LAND MANAGEMENT PARADIGM**

Land management is the process by which the resources of land are put into good effect (UN-ECE 1996). Land management encompasses all activities associated with the management of land and natural resources that are required to achieve sustainable development. The concept of land includes properties and natural resources and thereby encompasses the total natural and build environment.

The organisational structures for land management differ widely between countries and regions throughout the world, and reflect local cultural and judicial settings. The institutional arrangements may change over time to better support the implementation of land policies and good governance. Within this country context, the land management activities may be described by the three components: Land Policies, Land Information Infrastructures, and Land Administration Functions in support of Sustainable Development. This Land Management Paradigm is presented in Figure 1 below.

Land policy is part of the national policy on promoting objectives including economic development, social justice and equity, and political stability. Land policies may be associated with: security of tenure; land markets (particularly land transactions and access to credit); real property taxation; sustainable management and control of land use, natural resources and the environment; the provision of land for the poor, ethnic minorities and women; and measures to prevent land speculation and to manage land disputes.

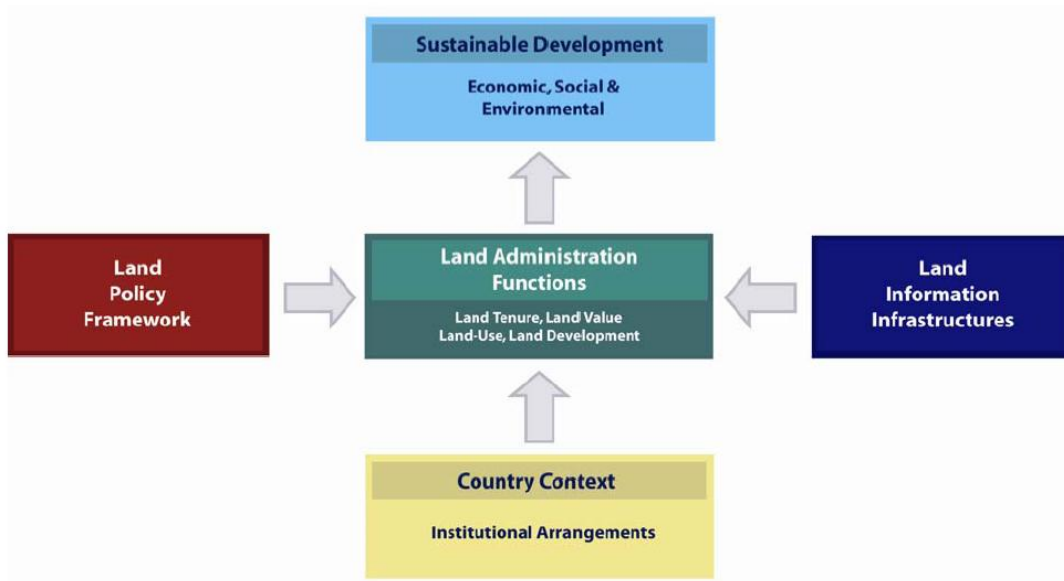


Figure 1. The Land Management Paradigm (Enemark et al., 2005).

The operational component of the land management paradigm is the range of land administration functions that ensure proper management of rights, restrictions, responsibilities and risks in relation to property, land and natural resources. These functions include the areas of land tenure (securing and transferring rights in land and natural resources); land value (valuation and taxation of land and properties); land use (planning and control of the use of land and natural resources); and land development (implementing utilities, infrastructure and construction planning).

The land administration functions are based on and are facilitated by appropriate land information infrastructures that include cadastral and topographic datasets and provide access to complete and up-to-date information about the built and natural environment. Sound land management is the operational processes of implementing land policies in comprehensive and sustainable ways. In many countries, however, there is a tendency to separate land tenure rights from land use rights. There is then no effective institutional mechanism for linking planning and land use controls with land values and the operation of the land market. These problems are often compounded by poor administrative and management procedures that fail to deliver required services. Investment in new technology will only go a small way towards solving a much deeper problem; the failure to treat land and its resources as a coherent whole.

## 4. LAND ADMINISTRATION SYSTEMS

LAS, and particularly their core cadastral components, are important infrastructures which facilitate the implementation of land policies in both developed and developing countries. LAS are concerned with the social, legal, economic and technical framework within which land managers and administrators must operate (UNECE 2005). These systems support efficient land markets and are, at the same time, concerned with the administration of land as a natural resource to ensure its sustainable development. This global approach to modern land administration systems is shown in Figure 2 below.

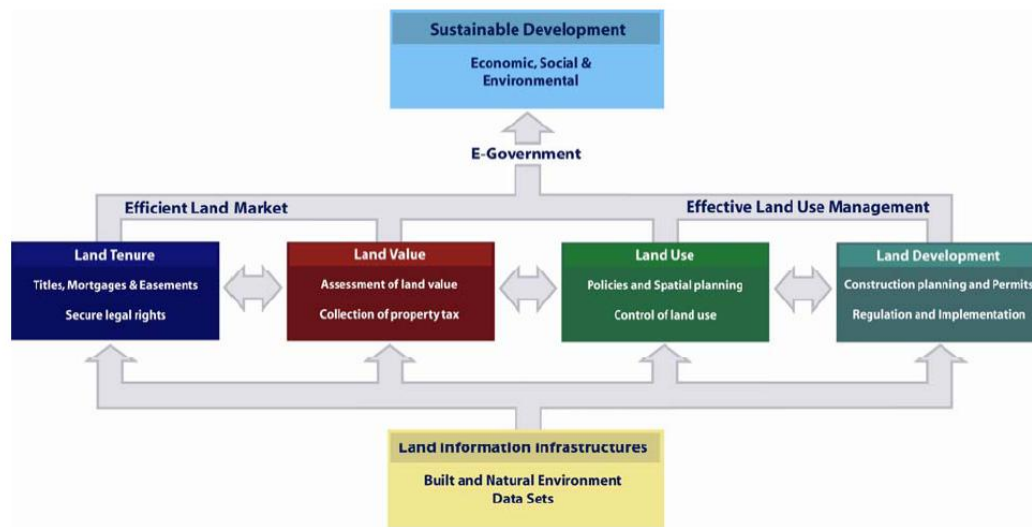


Figure 2. A Global Perspective of Modern Land Administration Systems

As described above, land administration comprises an extensive range of systems and processes to manage:

- **Land Tenure:** the allocation and security of rights in lands; the legal surveys to determine parcel boundaries; the transfer of property or use from one party to another through sale or lease; and the management and adjudication of doubts and disputes regarding rights and parcel boundaries.
- **Land Value:** the assessment of the value of land and properties; the gathering of revenues through taxation; and the management and adjudication of land valuation and taxation disputes.
- **Land Use:** the control of land use through adoption of planning policies and land use regulations at national, regional and local levels; the enforcement of land use regulations; and the management and adjudication of land use conflicts.
- **Land Development:** the building of new physical infrastructure; the implementation of construction planning and change of land use through planning permission and granting of permits.

These systems are interrelated. The actual economic and physical use of land and properties influence land value. Land value is also influenced by the possible future use of land as determined through zoning, land use planning regulations and permit granting processes. And the land use planning and policies will, of course, determine and regulate future land development.

The information on land and properties permeates through the system and provides the basic infrastructure for running the interrelated systems within the four interrelated areas. The land information area should be organised to combine cadastral and topographic data and thereby link the built environment (including legal land rights) with the natural environment (including environmental and natural resource issues). Land information should, this way, be organised as a spatial data infrastructure at national, regional/federal and local level based on relevant policies for data sharing, cost recovery, access to data, standards, etc.

The design of adequate systems in the area of land tenure and land value should lead to the establishment of an efficient land market capable of supporting trading in complex commodities. The design of adequate systems in the areas of land use control and land development should lead to effective land-use management. The combination of an efficient land market and effective land-use management should then form the basis for a sustainable approach to economic, social and environmental development.

A modern Land Administration System acts within the environment of adopted land policies that fulfill political objectives with regard to land issues. It also acts within an institutional framework that imposes mandates and responsibilities on the various agencies and organisations. The system is concerned with providing detailed information at the individual land parcel level. It should service the needs of both the individual and the community at large. Benefits arise through its application in guaranteeing of ownership, security of tenure and credit; facilitating efficient land transfers and land markets; supporting management of assets; and providing basic information in processes of physical planning, land development and environmental control. The system, this way, acts as a backbone for society.

These ambitious goals will not be achieved unless there is a commitment to designing and implementing effective land administration infrastructures. These may be described as the organisations, standards, processes, information and dissemination systems and technologies required to support the allocation, transfer, dealing and use of land (UN-FIG 1999). Information and communications technology (ICT) will play an increasingly important role both in constructing the necessary infrastructure and in providing effective citizen access to information. Also, there must be a total commitment to the maintenance and upgrading of the land administration infrastructure.

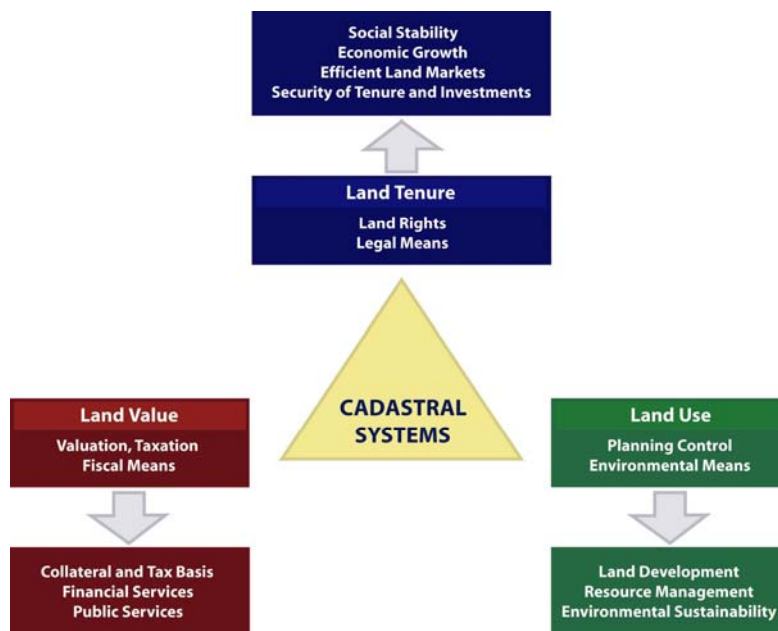
## **5. CADASTRAL SYSTEMS**

The International Federation of Surveyors (FIG, 1995) defines a cadastre as a “parcel based and up-to-date land information system containing a record of interests in land (e.g. rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of the interests, ownership

or control of those interests, and often the value of the parcel and its improvements. It may be established for fiscal purposes (valuation and taxation), legal purposes (conveyancing), to assist in the management of land and land-use control (planning and administration), and enables sustainable development and environmental improvement”.

However, the concept of Cadastre is difficult to identify. It may be designed in many different ways, depending on the origin, history and cultural development of the region or country. Basically, a cadastre as such is just a record that identifies the individual land parcels/properties. The purpose of this identification may be taxation (as was the reason for establishing the European cadastres) or it may be security of land rights (as was the case when establishing the Torrens systems in the new world such as Australia). Today, most cadastral registers around the world are linked to both the land value/taxation area and the area of securing legal rights in land.

Therefore, it makes sense to talk about Cadastral Systems or Cadastral Infrastructures rather than just Cadastre. These systems or infrastructures include the interaction between the identification of land parcels, the registration of land rights, the valuation and taxation of land and property, and the control of present and possible future use of land. This is shown in figure 1 below (Enemark, 2004).



*Fig.3: Cadastral systems provide a basic land information infrastructure for running the interrelated systems within the areas of Land Tenure, Land Value, and Land Use.*

Even though cadastral systems around the world are clearly different in terms of structure, processes, and actors, they are increasingly merging into a unified global model: the multi-purpose cadastre. This is due to some global drivers: globalisation and technology development. These trends supports establishment of multifunctional



information systems with regard to land rights and land-use regulations. A third global driver is sustainable development with its demand for comprehensive information on the environmental conditions in combination with other land and property related data.

The identification of land parcels in the cadastral system provides the basic infrastructure for running the interrelated systems within the areas of Land Tenure, Land Value, and Land-Use. As a result, the traditional surveying, mapping and land registration focus has moved away from being primarily provider-driven to now being clearly user-driven. However, each of those systems includes tasks and processes that impose quite different demands on the cadastral system. The success of a cadastral system is a function of how well it internalizes these influences and achieves these broad social, economic and environmental objectives.

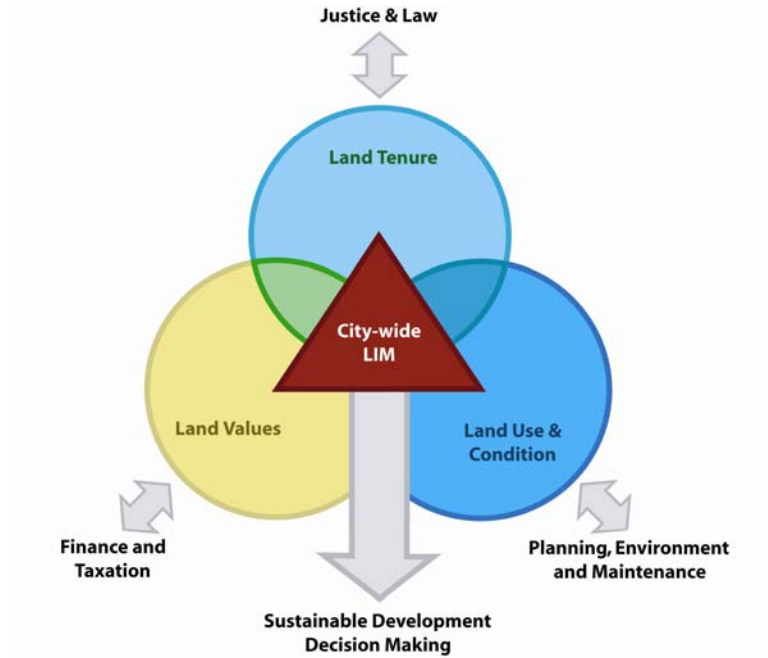
## **6. LAND INFORMATION MANAGEMENT**

The modern land administration system is concerned with detailed information at the individual land parcel level. As such it should service the needs of both the individual and the community at large. Benefits arise through its application to e.g.: guarantee of ownership and security of tenure and credit; facilitate efficient land transfers and land markets; support management of assets; and provide basic information in the processes of physical planning, land development and environmental control. This type of system acts as a kind of backbone in society.

These ambitious goals will not be achieved unless there is a commitment to designing and implementing effective land administration infrastructures. These may be described as the organisations, standards, processes, information and dissemination systems and technologies required supporting the allocation, transfer, dealing and use of land (UN/FIG, 1999). Information technology will play an increasingly important role both in constructing the necessary infrastructure and in providing effective citizen access to information. Also, there must be a total commitment to the maintenance and upgrading of the land administration infrastructure.

City Governments currently manage considerable collections of land related information. However, the traditional separation of this information into different component themes, combined with disjoint information management regimes, leads to a considerable loss in value of the information as a resource. Comprehensive and City-wide Land Information Management (LIM) provides the means to technically and institutionally integrate these component themes of land information into a truly corporate information resource (FIG/UN-HABITAT, 2002). Figure 4 below illustrates how this concept can add value by combining information concerning use, condition, value, and tenure of land and disseminating this to the decision makers.

The Land Information Management System of a city should fit into the corresponding spatial data infrastructure of the country. Certain information needs can best be served from the national level e.g. data standardisation, small-scale mapping, and policies for cost recovery and access to data.



*Fig. 4. Citywide Land Information Management in support of sustainable development decision-making (FIG/UN-HABITAT, 2002)*

## 7. THE ROLE OF FIG

FIG can support the process of building capacity for sustainable land management in three ways:

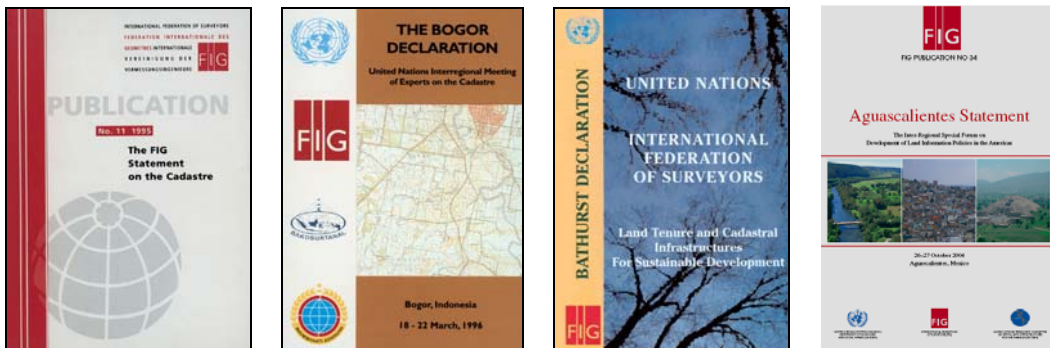
**Professional development.** FIG provides a global forum for discussion and exchange of experiences and new developments between member countries and between individual professionals in the broad areas of surveying and mapping, spatial information management, and land management. This relates to the 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 provides institutional support to individual member countries or regions with regard to developing the basic capacity in terms of educational programs and professional organizations. The educational basis must include programs at minimum Bachelor level that include the combination of surveying and mapping, Spatial Information management, and Land Management. Such programs combine the land administration/cadastral/land registration function with the topographic mapping function within a holistic land management perspective. The professional organizations must include the basic mechanisms for professional development including standards, ethics and professional code of conduct for serving the clients.

**Global development.** FIG provides a global forum for institutional development through cooperation with international NGO's such as the United Nations Agencies (UNEP, FAO, HABITAT), the World Bank, and sister organizations (IAG, ICA, IHO, and ISPRS). The cooperation includes a whole range of activities such as joint projects (e.g. Bathurst, Aguascalientes), 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.

The three means of development are of course interrelated and interdependent. Professional development requires that both a professional organization and an educational basis are in place. Institutional development in terms of mature public agencies and policies requires a solid professional and educational base in order to establish a holistic and sustainable approach to land management based on principles of good governance and an adequate balance between the activities of the public and private sector. And global development of course requires mature NGO's with a strong professional base.

Throughout the last 10-15 years FIG has taken a lead role in explaining the importance of sound land administration systems as a basis for achieving "the triple bottom line" in terms of economic, social and environmental sustainability. International organizations such as UN, FAO, HABITAT and especially the World Bank have been key actors in this process. A number of these key publications are shown below. The latest achievement entitled the Aguascalientes Statement on Development of Land Information Policies in the Americas is developed as a joint initiative of UN/FIG/PCIDEA with FIG taking the lead role. The publication is available in both English and Spanish.



Furthermore, the FIG publication Series also includes a number of publications addressing educational, professional, and institutional issues of global relevance, such as Continuing Professional Development, Ethical Principles, and Business Matters for Professionals, Standardisation, and Mutual Recognition of Professional Qualifications. The publications are available on-line at the FIG Home Page <http://www.fig.net/pub/figpub/pubindex.htm>

## **FINAL REMARKS**

The objective of this paper is to build a general understanding of the concept, purpose and benefits of establishing sustainable land administration systems in support of sustainable development and the Millennium Development Goals.

Especially in developing countries the debate should move from “whether this is desirable” to “what is the most appropriate land administration system to serve the needs of an individual country or jurisdiction”. This debate should be aware of the global trends in this area while still recognising that the design of such systems will always be unique due to the different geographic and cultural preconditions and needs of each respective country.

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 systems and the core cadastral component provide information about geographical objects and their attributes. In this regard the principle of data sharing should be applied when creating a national geo-spatial data infrastructure that include cadastral and topographic datasets and provide access to complete and up-to-date information on the built and natural environment.

Land administration activities are, however, 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.

## **CONTACTS**

Professor Stig Enemark  
President of the International Federation of Surveyors, FIG  
Aalborg University, Fibigerstrede 11  
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)

## REFERENCES

Enemark, S. and Schoeler, K.L., Eds., (2002): The Danish Way. The Danish Association of Chartered Surveyors, Copenhagen. <http://www.ddl.org/thedanishway>

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.

FIG (1995): Statement on the Cadastre. FIG publications no. 11. FIG Office, Copenhagen. [http://www.fig7.org.uk/publications/cadastre/statement\\_on\\_cadastre.html](http://www.fig7.org.uk/publications/cadastre/statement_on_cadastre.html)

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>

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-FIG (1999) : The Bathurst Declaration on Land Administration for Sustainable Development. FIG Publication Series No 21, FIG Office, Copenhagen. <http://www.fig.net/pub/figpub/pub21/figpub21.htm>

UN-ECE (2005): Land Administration in the UNECE Region – Development trends and main principles. UNECE, Geneva. <http://www.unece.org/env/documents/2005/wpla/ECE-HBP-140-e.pdf>

UN-FIG-PCIDEA (2005): Aguascalientes Statement – The Interregional Special Forum on Development of Land Information Policies in the Americas. FIG Publication Series No 34, <http://www.fig.net/pub/figpub/pub34/figpub34.htm>

## 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 2003-2006). 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>