BUILDING SUSTAINABLE AND TRANSPARENT SPATIAL FRAMEWORKS

Fit-for-purpose Land Administration

There is an urgent need for a flexible approach to building the spatial framework in terms of technology and investment choices. Building such a spatial framework is not primarily about accuracy. Instead it is about adequate identification and representation of the spatial objects and parcels, completeness to cover the total jurisdiction, and credibility in terms of reliable data that is trusted by users.

Most developing countries have cadastral coverage of less than 30 percent of the country. These cadastral systems normally operate in line with procedures for cadastral surveys and land registration as introduced (mainly for the elite) by Western societies in colonial times, and the systems do not recognise the range of more informal, social or customary types of tenure. This means that over 70 percent of the land in many developing countries, such as the sub-Sahara region, is generally outside the formal land administration system. This has caused enormous problems with regard to food security and rural land management issues in cities with an increasing population of slum dwellers, for example, and in rural areas. Building spatial frameworks in developing countries is a major challenge, but one that is fundamental for building systems in support of sustainable and transparent land governance.

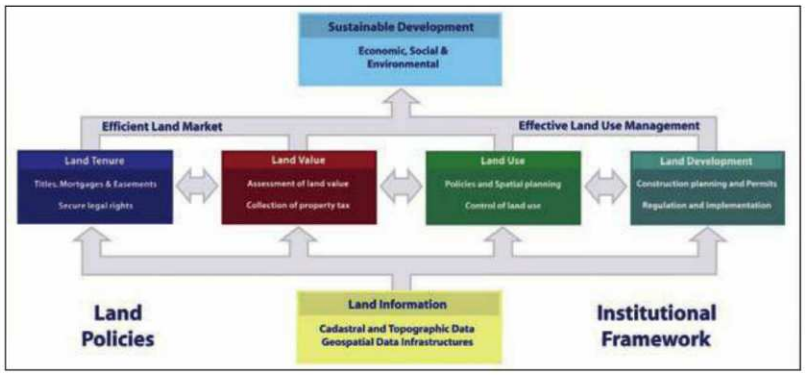
GLOBAL PERSPECTIVE

A land administration system (LAS) provides a country with the infrastructure to implement land-related policies and management strategies. It is not a new discipline but has evolved out of the cadastre and land registration areas with specific focus on security of land rights. The need to address land management issues systematically pushes the design of a LAS towards an enabling infrastructure for implementing land policies. Such a global land administration perspective is presented in Figure 1.

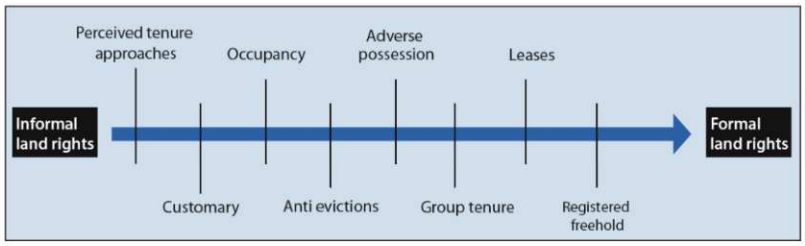
Modern LAS deliver an essential infrastructure and encourage integration of the processes related to land tenure (securing and transferring land rights), land value (valuation and taxation of land), land use (planning and control of the use of land), and land development (implementing utilities, infrastructure and construction planning). The four functions interact to deliver overall policy objectives, and they are facilitated by appropriate land information infrastructures that include cadastral and topographic datasets linking the built and natural environments. Ultimately, the design of adequate systems of land tenure and value should support efficient land markets

Stig Enemark, professor of land management at Aalborg University, Denmark, is honorary president of the International Federation of Surveyors (FIG), of which he was president from 2007 to 2010. He is also past president and honorary member of the Danish Association of Chartered Surveyors. Professor Enemark is a well-known international expert in the areas of land administration systems, land management, spatial planning and related educational and capacity-building issues, and he has published widely in these areas.

✉ enemark@land.aau.dk



▲ *Figure 1, A global land administration perspective (Enemark, 2004; Williamson et.al., 2010).*



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

capable of facilitating trading in simple and complex commodities.

SPATIAL FRAMEWORK

The spatial framework is basic large-scale mapping showing the way land is divided into parcels and plots for specific use and ownership purposes. It provides the basis for dealing with land administration functions such as: recordation and management of legal and social tenure; assessment of land and property value and taxation; identification and management of current land use; planning for future land use and land development; delivery of utility services; and administration and protection of natural resources. The framework should be linked to the country's National Grid point reference system through a positioning infrastructure based on Global Navigation Satellite Systems (GNSS) so that maintenance, updating and upgrading can take place whenever needed. Also, the framework may well include volunteered information provided by citizens (crowdsourcing) where authoritative data is not required or available. When considering the resources and capacities required for building such spatial frameworks in developing countries, the Western concepts may well be seen as the end target but not as the point of entry.

SOCIAL TENURE

The legal or formal Western systems do not serve the millions of people whose tenures are predominantly social rather than legal. The Social Tenure Domain Model (STDM) recognises land rights as a continuum ranging from informal to more formalised stages as shown in Figure 2, even though this process does not mean that all societies will or should necessarily develop into freehold tenure systems.

The STDM concept focuses on the relationship between the parties (tribes, people, villages, co-operations, organisations or governments), social tenure relations (people-land relationships, which can be formal, informal, customary or may even conflict) and spatial units (a sketch-based, point-based, line-based or polygon-based representation of the real situation in which the social tenure occurs).

The FAO voluntary guidelines on 'Responsible Governance of Tenure' place tenure rights in the context of human rights such as the rights to adequate food and adequate housing. With the help of the Guidelines, a variety of actors can determine whether their proposed actions and the actions of others constitute acceptable practices.

CONTINUUM OF ACCURACY

The spatial framework should be developed using a flexible and fit-for-purpose approach rather than being guided by high-tech solutions and costly field survey procedures. Accuracy can then be incrementally improved over time when relevant and justified by serving the needs of citizens and society. In relation to UN Habitat's concept of the continuum of land rights, such a fit-for-purpose approach could be referred to as a 'continuum of accuracy'. The key focus should be on providing secure land rights for all, and managing the use of land and natural resources for the benefit of local communities and society as a whole.

FIT FOR PURPOSE

'Fit for purpose' means that the framework should be designed for the purpose of managing current land issues within a specific country or region, rather than following more advanced technical standards. The land administration functions may place different requirements on accuracy, which again may vary depending on the geography and density of the use of land. Security of tenure does not in itself require accurate boundary surveys when the important aspect is identification of the land object with its legal or social right. Also, the accuracy required for the purpose of planning and management of the use of land varies considerably. The scale of the framework depends on topography and density of development, and may vary from large-scale mapping in dense urban areas to minor-scale images in rural and remote ▶

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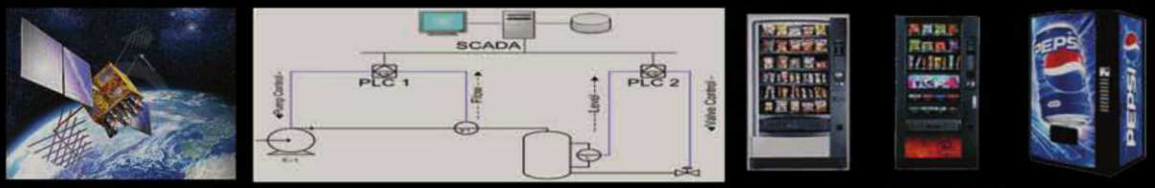

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regions. Accurate surveys of property boundaries may be justified in high-value urban areas. Accuracy is a relative term that relates to the purpose of creating the spatial framework. Four key principles of a fit-for-purpose approach for developing the spatial framework can be recognised, as outlined below.

1. GENERAL BOUNDARIES

Using general boundaries (the physical object in the field) will be sufficient for most land administration purposes, especially in rural and semi-urban areas, while fixed boundaries (monuments and surveyed) will contribute to interoperability between legal and physical objects in advanced land information systems and also to reducing boundary disputes to some extent. Fixed boundaries can be used where relevant or necessary for any specific purpose or when required and paid for by the landowner/stakeholders.

2. SATELLITE IMAGES/ORTHOPHOTOS

Using large-scale satellite images (e.g. 50cm resolution) or orthophotos will be sufficient for most land administration purposes. Boundaries can easily be identified on the images/orthophotos in most cases. Experience shows that people can generally read the images easily, which enables a participatory approach to boundary determination to be applied. Non-visual boundaries can be added simply using handheld GPS or field survey field survey measurements. Satellite images/orthophotos are much cheaper than field surveys and do not require trained professionals to undertake the field work. The mapping methodology using satellite images/orthophotos also provides the general topography of land use and buildings and infrastructure.

3. ACCURACY RELATES TO THE PURPOSE

Accuracy of the information such as the parcel boundaries should be understood as a relative issue related to the use of this information, while technical standards are often inflexible and out of proportion to the purpose. The need for accuracy of the various features should be determined by the purpose of using this information for dealing with the various land administration functions. In this regard, registration of legal and social tenure rights requires identification of the object but the process itself does not call for a high degree of accuracy. Also, planning and land development processes mainly require sufficient mapping for identifying physical and spatial objects rather than high accuracy. Any demand for accuracy may stem from issues such as high land value in dense urban areas or implementation of costly construction work.

4. OPPORTUNITIES FOR UPDATING AND UPGRADING

Building the spatial framework is not a one-stop process; it should be seen in a perspective of opportunities for ongoing updating, sporadic upgrading and incremental improvement whenever relevant or necessary for fulfilling land policy aims and objectives. This of course requires that mapping and surveys are linked in a National Grid system. It is essential to continually update procedures in order to ensure that all data is complete and reliable. Without such procedures, the investment is easily wasted over a relatively short period. The opportunity for upgrading is essential and allows for providing an improved map base whenever needed for specific purposes such as land development activities, major construction works and building of infrastructure. This allows for incremental improvement that, in turn, will establish a spatial framework in line with modern and fully integrated land information systems.

CONCLUDING REMARKS

The spatial framework in most developed countries has evolved over a long period of time and in response to societal, institutional and technological advancements. While developing regions cannot wait for the framework to evolve naturally, it should nevertheless always be built in response to current societal needs and available economic resources. Professional codes support the existing systems, and there are many examples of resistance to change that will challenge their position. On the other hand, by including all land in the formal land administration systems, land professionals will contribute to social development while at the same time enlarging their functions and customer base. The key benefit of a fit-for-purpose approach is that it is possible to include all land in the formal land administration system within a reasonably short time and at a relatively low cost. ◀

FURTHER READING

- Enemark, S. (2004): Building Land Information Policies, Proceedings of Special Forum on Building Land Information Policies in the Americas, 26-27 October 2004, Aguascalientes, Mexico.
- FAO (2012): Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of Food Security. Rome, Italy
- FIG/GLTN (2010): The Social Tenure Domain Model. FIG Publication No. 52, Copenhagen, Denmark
- FIG/World Bank (2010): Land Governance in Support of the Millennium Development Goals – A new agenda for land professionals. FIG Publication No. 45, Copenhagen, Denmark
- Williamson, Enemark, Wallace, Rajabifard (2010): *Land Administration Systems for Sustainable Development.* ESRI Academic Press, Redlands, California, USA.