

**UNITED NATIONS COMMITTEE OF EXPERTS ON
GLOBAL GEOSPATIAL INFORMATION MANAGEMENT**

**The Application of Geospatial Information –
Land Administration and Management**

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1.0 Background

At its fourth session, in August 2014, the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) approved the addition of a new work item, “*The application of geospatial information – land administration and management*” into the Provisional Agenda. The initial request to advance this work item was tendered by the United Kingdom and further supported by Bangladesh, France, the Netherlands, the United States and Norway. The following is an excerpt from The Netherland’s supporting statement:

“...we acknowledge the identified themes as mentioned in the report. However, we would like to put more emphasis on the theme of land registry data. Although mentioned in the text several times, we think land administration should become a more predominant theme in the context of UN-GGIM... We need to act and UN-GGIM can play a powerful role in this. Doing this, UN-GGIM will enforce the post-2015 agenda of other organisations like FIG, World Bank, FAO and UN-Habitat. Good land administration, considering both formal and informal rights of the use and ownership of land, is a basic requirement for social and economic development”

Geospatial/land information and its management are fundamental to successful land administration and the derived benefits to the economies and overall sustainable development of nations. Furthermore, it is critical to the successful implementation of the Sustainable Development Goals, as it is able to provide reliable data on land, including its tenure and dimensions, at local scales. Despite substantial work being undertaken and completed on land issues by non-government organisations, professional bodies and global organisations, more work needs to be undertaken to consider the geographical information management aspect which assists considerably with land governance, land administration and management.

The Committee of Experts is uniquely placed to discuss, enhance and co-ordinate global geospatial information management issues, given its mandate as the apex geospatial information management mechanism in the United Nations. By extension its mandate and position supports the call to provide policy direction and support for land administration to Member States.

This paper seeks to provide the Committee of Experts with information to satisfactorily guide its discussions and to enable the crafting of applicable and achievable next steps at its fifth session in August 2015. The first section of the paper provides overall definitions of land governance, land administration and land management. This is followed with a problem statement which puts in context the importance of land amid global issues of increasing urban populations, food security through to the rights of women. The paper then attempts to provide a snapshot of some of the initiatives taken to address land governance issues at the global level, and then highlights the current

issues impacting land administration and management. The paper concludes with potential areas of focus to be considered by the Committee of Experts.

2.0 Land Governance, Administration and Management Defined

Land Governance

Good governance is recognized as a platform for achieving development potential, implementing effective and efficient systems and ensuring good management through all levels of society. It is generally accepted that good governance is based on a set of principles that include: participation; rule of law; equity; accountability; transparency; consensus; inclusiveness and efficiency. Land has always been subject to corruption, poor public management and incoherent and inconsistent legal frameworks; and in addressing these challenges “good governance” has been integrated within land administration.

Land governance has been defined as policies, processes and institutions by which land, property and natural resources are managed “Sound land governance requires a legal regulatory framework and operational processes [designed] to implement policies consistently within a jurisdiction or country, in sustainable ways.” (Enemark, Bell, Lemmen, McLaren: 2014).

Land Governance has become the central tenet through which land administration and land management is now generally addressed. This approach to land administration received major emphasis in 2012 when Member States passed the Voluntary Guidelines on Responsible Governance of Tenure, Land, Fisheries and Forests in the context of Food Security. Land governance is “the rules, processes and structures through which decisions are made regarding access to, and the use [and transfer] of land, the manner in which those decisions are implemented and the way that conflicting interests in land are managed” (FAO & UN-Habitat: 2011). This definition highlights three important dimensions: (1) institutions; (2) quality of decision-making and the translation into action; and (3) managing conflicting interests. Thus, good governance within land administration and land management institutions is essential for sustainable development.

Through the protection, legal recognition, sustainable use and management of common lands and natural resources, three overall objectives should be attained:

- human rights and wellbeing,
- equitable prosperity and sustainable livelihoods, and
- healthy and sustainably managed environments.

Common land and natural resources pertain to rangelands, forests, wetlands, and the natural resources therein – both above and below ground (UNEP 2014). Developing accurate and real time geospatial data on common land and natural resources will raise awareness, political support and practical outcomes from stronger recognition of secure common land and resource tenure rights in many different fora and processes, including the Post 2015 Agenda, United Nations specialized agency processes, and civil movements including that of Indigenous Peoples. As such, it is considered as a universal issue applicable to all countries. However, the identification, measurement, governance, and legal protection of such lands face challenges, as they need to be treated differently from private land and property. UN-GGIM, in partnership with other entities such as FAO, GLTN, WB and others, are in a good position to develop the methodology required for applying geospatial data for the sustainable management of common lands and natural resources. Until such time as scientifically viable methods are developed, crowd sourcing (including encouraging local communities to send GNSS positions that identify their common lands to a central portal) can be effectively used.

Land Administration

Land administration, as defined by the UNECE, is the “processes of determining, recording and disseminating information about the tenure, value and use of land when implementing land management policies”. The land administration system is a basic foundation for the spatial enablement of a society and is considered to include land registration, cadastral surveying and mapping, fiscal, legal and multi-purpose cadastres and land information systems (UNECE, 1996).¹

While this definition fits well into the UNECE context, it does not always apply to developing countries, which often have a much wider range of tenure regimes than just freehold.

The definition of land administration provided by FAO² better responds to the realities of developing countries. FAO defines land administration as the way in which the rules of land tenure are applied and made operational. Land administration, whether formal or informal, comprises an extensive range of systems and processes to administer:

- Land rights: the allocation of rights in land; the delimitation of boundaries of parcels for which the rights are allocated; the transfer from one party to another through sale, lease, loan, gift or inheritance; and the adjudication of doubts and disputes regarding rights and parcel boundaries.
- Land-use regulation: land-use planning and enforcement and the adjudication of land use conflicts.
- Land valuation and taxation: the gathering of revenues through forms of land valuation and taxation, and the adjudication of land valuation and taxation disputes.

¹ FIG Publication No. 58, *Spatially Enabled Society*, edited by Daniel Steudler and Abbas Rajabifard, April 2012

² FAO (2002): *Land tenure and rural development*. FAO Land Tenure Studies No. 3, pg. 14

As such, Land administration systems are noted to provide a country with the infrastructure for implementing land policies and land management strategies in support of sustainable development. They are also central among land management activities, which also include land policies and land information systems. (Enemark, Bell, Lemmen, McLaren: 2014)

Land Management

Land Management is the art or science of making informed decisions about the allocation, use and development of the earth's natural and built resources. [It] includes resource management, land administration arrangements, land policy and land information management (Jeyanandan, Williamson and Hunter: 1990). It is "the process of managing the use and development of land resources and the process by which a country's resources are put to good effect (UNECE, 1996; Williamson et al, 2010)

Land management is therefore the activities associated with land as a resource to achieve, social, environmental and economic sustainable development. It includes the development and management of utilities and services; the management of land resources such as forestry and soils; the implementation of land use policies; environmental impact assessment and monitoring activities that affect good land use.³ Land Administration is part of the infrastructure that supports good land management.

The Pro-poor land management concept was created by UN-Habitat as a non-traditional and an additional approach to secure land property rights for the poor, in particular informal settlers and rural dwellers. Pro-poor land management can be viewed as constituting the gamut of activities within the land sector that are based on, respond to, and comprehensively reflect the national and local land and property conditions, and support economic, social, environmental and political improvements for the poor.

Landscape management is increasingly being seen as a holistic way in addressing the health of ecosystems, the strength of livelihoods, and the degree of productivity of a defined-geospatial scale. Adopting a landscape approach in policy making can help us to better analyze and assess the trade-offs between different forms of land-use, and to make decisions that are just, and environmentally and economically sound.⁴ Geospatial information is a necessary part of managing with a landscape approach.

³ Land Administration in the UNECE Region, Development trends and main principles, ECE, Geneva, 2005

⁴ See more at:

(<http://www.unep.org/NewsCentre/default.aspx?DocumentID=2813&ArticleID=11099&l=en#sthash.EESpo4v6.dpuf>).

3.0 The Importance of Land Amid Global Issues

Good governance in land tenure and administration is recognized as essential for promoting economic development and ensuring good management through all levels of society.

In Member States where good governance has been introduced, considerable transformation of the country has been enabled. A very good case study is Rwanda, where in 2009 only 40,000 land plots were registered, but by 2015, over 10 million had been officially registered through a very successful land tenure reform program. This has substantially reduced land theft, enabled women and children to be freed from physically protecting their land on a daily basis, and enabled Banks to provide loans based on the security given by the land ownership. The Banking System in Rwanda has been connected to the Land System, so that electronic transactions can easily take place, resulting in the time taken for loans to be approved being reduced from many months to an average of three days.

The global population is facing a range of large scale challenges, which create increased competition over land at the transnational, national, sub-national, local and family levels. This competition will increase over the next decades. By 2050 the world's population will grow to around 9.6 billion people. Current rates indicate a global population growth of 1 billion every 12 years (UNDESA). More than 50 percent already live in urban areas (UNFPA). All these people will need shelter and have to be fed in a sustainable way. The impact of this growth will be the greatest in the developing world, and particularly in Africa, where large scale urbanisation is expected (UN-Habitat). Yet 70 percent of most developing countries are not covered by a land administration system, and even in the 30 percent where land administration exists, often there is no digital data as the systems are manual. Also, often national mapping is very out of date. This means that while there may in some instances be geospatial data for the 30 percent, there is often no national coverage of geospatial data for developing countries.

Food security is also a major issue. FAO estimates that 805 million people were chronically undernourished in 2012–14, particularly in Sub Saharan Africa and Asia. Average annual growth rates of yields (output per hectare) for grains have actually been slowing in both developed and developing countries since 1985. Water is key to food security. Already two-thirds of global water supplies for irrigation are drawn from underground aquifers at unsustainable rates (FAO). The growing of crops is exacerbated by climate change according to the 2014 report from the United Nations Intergovernmental Panel on Climate (IPCC). Climate change could reduce food production growth by 2 percent each decade for the rest of this century. The IPCC concluded that “Global temperature increases of 4°C or more above late-20th century levels, combined with increasing food demand, would pose large risks to food security globally.”

What this means in human terms is that, millions of people around the world face difficulties related to the land where they live, work, grow crops, tend animals and run businesses. Even though they or their families may have lived on the land for many years, it is a serious obstacle that they have no formal relationship to the land. Perhaps it is too expensive to get the official paper that documents their claim, or possibly inheritance laws or local customs prevent them from even making a claim. There are many reasons for insecure tenure and women and young people in particular face major barriers.

In developing countries, conventional ways to manage and administer land have a history of failing to deliver what is expected of them, that is, secure tenure, fairness and broad coverage at a price that is affordable for both landholders and governments. Existing technical solutions are too expensive, they are inappropriate for the range of tenure found in developing countries, they are financially unsustainable, and they are unfeasible given the available capacity to manage them. At the same time, the need for workable systems to manage and administer land is now greater than ever, with new challenges being added to the problems that already exist.

Land is a finite resource and competition for it is intensifying because of rapid urbanization, growing populations, economic development, persistent insecurity of food, water and energy, and the effects of conflicts and disasters. Changes in land use affect the economy, society and ecology of the areas around cities and the divide between urban and rural is diminishing. These areas are today interconnected by flows of goods, money, resources and people. Climate change and different land-use patterns also affect rural areas, including farmland, dry- lands, wetlands and forests.

There are also immense opportunities for tapping the positive transformation of cities, including the potential of economies of scale, governance, and land and property tax systems to self-finance cities. Rural land also needs to be managed cautiously. Pressure on rural land is increasing as a result of a rising world population (now at seven billion), climate change, declining soil fertility and the need for global food and fuel security. With countries and businesses now recognizing the potential for growing biofuel crops on land that cannot sustain food crops, even less-fertile land can have greater value. Globalization is also increasing the demand for such land for tourism. These trends offer developing countries an opportunity to attract foreign investment, but they also threaten the land rights of small-scale producers and indigenous communities. When irrigation is introduced into previously rain fed farmland, or roads are built to link farmers to markets, the new economic potential of the land makes it more attractive, and small-scale producers can lose their land to more affluent or powerful interests. For many of the world's rural women and men in developing countries, secure access is becoming less certain than ever. Ultimately, the failure to reconcile competing interests in land across the rural-urban continuum can contribute to the outbreak of violent

conflict. This is the most acute outcome of failed efforts to manage the opportunities that land provides.

Land involves a wide range of rights and responsibilities. It is in demand by a wide range of users, institutions and interest groups for different and often conflicting reasons, for example, housing and livelihoods, access to credit, investment, cultural heritage, and political power. Competing claims over land often occur under conditions of unequal power and resources. Rich people and the middle classes have the means, knowledge and connections to buy and sell land, register it officially, demand services, use land as collateral to borrow money, and defend their rights to it. The situation is different for people with low incomes, and especially for poor women and young people. They lack the resources to do these things. Also, most land management and administration systems are biased against poor people and often ignore realities on the ground. For example, an area designated as “open land” may in reality be an informal settlement that is home to thousands of people. Without any official rights to the land they live on, these residents have no security of tenure, little incentive to invest in their homes, and no way of getting loans to do so. Getting their paperwork into order often means navigating a costly bureaucratic and legal maze.

Women are particularly at a disadvantage. In many countries, by law, practice or custom women cannot own land or make decisions on how to use it. Widows and single mothers are particularly vulnerable; when her husband dies or leaves her, a woman may lose the rights to her home and to the land she farms. Often, women are not allowed to buy land or register it in their own name, even if they have the money. Young people face a similar situation; in many places, decisions are made by groups of elders – almost all of them men. Young people have few chances to control the land they need to build their lives or to use what is perceived as “adult only” resource (Handling Land: Global Land Tool Network 2012).

Many developed countries have over many years built effective and efficient land administration and management systems, which support and propel their land markets and economies. This therefore means that their land administration issues vary from those of the developing world. These countries, for example Australia, face challenges of “convincing political masters that the cadastral system needs ongoing attention and improvement. It is not uncommon for them to question why funds should be spent to fix something that works!”⁵ In addition “it is becoming increasingly difficult to convince them of the need for an ongoing commitment.” Another issue which has become an international trend is “the reduction over the years in the emphasis on cadastral and land administration issues in university degrees... this undermines the capacity of countries to design, build and manage modern cadastres needed for the decades ahead”

⁵ Williamson Ian P, 2015. Is complacency the biggest threat to modern cadasters?. In *Coordinates* Vol XI, Issue 4, April ,2015, page 16

4.0 Land Administration and Management Initiatives

The request from the Committee of Experts to address land administration issues within the geospatial sphere, and in support of sustainable development, is not new. The United Nations Statistics Division, through its Regional Cartographic Conferences for Asia-Pacific and for the Americas, in collaboration with international bodies such as the International Federation of Surveyors (FIG) and other United Nations bodies have been addressing cadastral, land information and land tenure issues for over thirty five years. The following table highlights some of the major calls for action to address land administration and management issues, additional details are provided in Annex I.

Year	Event/Organisations	Action/Decision
1997	8th Regional Cartographic Conference for Asia-Pacific	Creation of an advisory panel on cadastral surveying and mapping
1980	9th Regional Cartographic Conference for Asia-Pacific	Resolutions on capacity development for cadastral mapping, cadastral survey systems and national LIS
Oct 1999	Bathurst Workshop on Land Tenure and Cadastral Infrastructures for Sustainable Development	<i>The Bathurst Declaration</i>
April 2011	Governing Council of the United Nations Human Settlement Program	Resolution on “Sustainable urbanization through equitable access to land, housing, basic services and infrastructure”
Feb 2012	Permanent Committee on GIS Infrastructure for Asia and the Pacific, GSDI ⁶ & FIG	<i>The Kuala Lumpur Declaration on Spatially Enabled Government and Society.</i>
May 2012	United Nations Committee on World Food Security	The Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests
Dec 2012	International Organization for Standardization	The Land Administration Domain Model (LADM) as a standard was published (ISO 19152:2012)
Mar 2014	International Federation of Surveyors and World Bank	<i>Fit-For-Purpose Land Administration</i>
Oct 2014	Third High Level Forum on United Nations Global Geospatial Information Management	<i>The Beijing Declaration on Sustainable Development with Geospatial Information</i>

⁶ GSDI- Global Spatial Data Infrastructure Association

Areas of Work being addressed by Global Organisations

Entities such as the African Union, World Bank, Food and Agriculture Organisation (FAO) and United Nations Human Settlement Programme (UN-Habitat), UNECE, UNECA and UNESCAP have been assiduously working towards ameliorating land tenure, land administration and management challenges. However the issues remain a global concern particularly in developing countries.

Area of Work in Land Administration	FAO	FIG	UN Habitat	World Bank	UNECE
Land policy development	X	X	X	X	X
Conflict resolution			X		
Strengthening land governance arrangements			X		
Capacity Development	X	X	X	X	X
Institutional Strengthening	X		X	X	
Building and Implementation of LAS				X	
Assessment and monitoring of land governance		X		X	
Monitoring land issues and trends		X		X	
Drafting of land laws and policies					
Preparation and maintenance of cadastral maps				X	
Land registration projects				X	
Advocating & Implementing the Fit for Purpose Approach	X	X	X		

5.0 Land Administration and Management Issues

A general literature research revealed that, notwithstanding the many millions of dollars spent on land administration/land management, tenure regularization, land markets and land governance projects, countries depending on their state of adoption of modern land administration and management approaches, continue to experience challenges in the implementation and management of efficient land administration and management systems and transparent, functioning land markets. The issues are many, ranging from data management, institutional, technology adoption and sustainability, governance and capacity constraints.

The following are the major issues identified divided into categories. An examination of the issues showed that of all the categories, governance issues were the most significant. This therefore infers that more attention and work is needed in this area.

Governance

1. The need for increased global awareness of the problems associated with state/public land and its management, and their impact on efficient use and equitable access to land.
2. Public land are generally poorly managed.

3. Political interference in the management, allocation and acquisition of public land.
4. Undefined tenure arrangements and responsibilities.
5. Vested interest of powerful people lead to strong resistance of land management measures.
6. Lack of policy framework and its integration with other policies (Land Policy, Fiscal Policy, Economic Policy).
7. Poor enforcement of land laws and regulations.
8. Land laws and sub sector related laws are not always in sync.
9. Separate rural and urban land administration systems.
10. The need to recognise and include customary and other evolving forms of tenure within formal land tenure systems.
11. High cost of tenure regularization and land registration stymie the poor from gaining security of tenure.
12. Land administration projects are poorly defined and underfunded with inadequate implementation horizons.
13. Need for increased and coordinated awareness and capacity building programs for the public.

Data management

1. Poor/weak records management – little or no data upgrading and quality maintenance.
2. Poor quality and out of date geospatial data.
3. Sparse or no national geodetic networks, which impairs geo-referencing, the collection of geospatial data and the preparation of cadastral and other maps.
4. Knowledge and use of standards to support the creation and management of land information – cadastral information and land administration systems.

Institutional

1. Ineffective land dispute resolution systems.
2. Lack of institutional cooperation – multiple agencies and fragmented institutional arrangements.
3. Existence of traditional monopolistic, land information silos.
4. Land administration authorities are detached from land users.
5. Weak land administration institutional capacities and processes.
6. Weaknesses in ability to identify and create business models to support innovation, and maintenance of land administration systems – in particular its information and communication technology infrastructure.

Technology adoption and sustainability

1. Resistance to change – old mind-set in the face of modern approaches.
2. Legal framework does not support ICT and e-government land administration services.

3. Non-computerised land administration systems.
4. The need to leverage the investments made in ICT and geospatial data acquisition for land administration across multiple agencies of government, to support land management other national geospatial data management operations and processes and ultimately sustainable development.

6.0 Why Should the Committee of Experts Focus on Land Administration and Management

“For an estimated 70% of the world population there is no registration of land - property relations. ... Good land administration, considering both formal and informal rights of the use and ownership of land, is a basic requirement for social and economic development”⁷

Land is the single greatest resource in most countries. Access to land, security of tenure and land management has significant implications considering the challenges faced by humanity today such as climate change, adequate and equitable housing, food security, disaster risk reduction, peace and security and ultimately sustainable development. Land administration provides as illustrated in Section 3.0, in Rwanda, an important infrastructure for an efficient economy, which means that it touches all aspects of how people earn a living.

Land and property taxes within an efficient land administration system plays a significant role in raising revenue for public finances. Through, registration and cadastre systems, land administration provides security of tenure, allows access to capital markets and enables financing for development with the use of land as collateral.

Place or location is a key facilitator in decision making. Land administration is essentially concerned with people-to-land relationship and is thus place-based and people-centric. This people-to-land relationship has a fundamental role in spatial enablement, where good land governance can facilitate government to respond to national and global agendas and achieve sustainable development⁸.

Consistent and accurate national mapping coupled with the acceptance of participatory mapping approaches at country level enables effective documentation of land rights and parcel information, and by extension improves land valuation and land rating.

Land administration is inherently geographical and good geospatial information is needed to manage geographic elements in a digital world. For example, in the United Kingdom good geospatial information enables the implementation of the planning system which puts in practice government policy as expressed through land

⁷ Dutch Delegation, 4th Session on UN-GGIM, NY August 2014

⁸ FIG Publication No. 58, Spatially Enabled Society, edited by Daniel Steudler and Abbas Rajabifard, April 2012

administration and management, whilst in most of Africa, the lack of complete cadastres has hindered the attainment of this. This necessitates the development and application of alternative approaches using participatory mapping methodologies that can be captured in the land information system of a country to not only enable the functioning of a country's planning systems but also support global processes.

Land administration systems provide a country with an infrastructure for implementing land policies and land management strategies in support of sustainable development. Such land administration systems need a spatial framework to operate. This framework may be very sophisticated and included as a basic layer of interactive land information systems, or, as suggested by the fit-for-purpose approach, it may be just imagery showing the way land is divided into plots for specific use and possession. The key focus should be on providing secure tenure for all, and managing the use of land and natural resources for the benefit of local communities and society as a whole in the process providing information for planning and decision making at country and global levels.

When considering the resources and capacities required for building spatial frameworks in less developed countries, the concepts predominantly used in developed countries may well be seen as the end target, but not as the point of entry. Using such advanced technical standards of adjudication, boundary marking and field surveys are far too costly, too time consuming and capacity demanding, and in most cases simply not relevant, for providing an initial suitable spatial framework.

The focus should therefore be on methods that are fast, cheap, complete, and reliable. The spatial framework can then be upgraded and updated whenever necessary or relevant in relation to land development and management activities. Also, the framework may well include volunteered information provided by citizens (crowd sourcing) where authoritative data are not required or available (McLaren, 2013).

Much important and valuable work on fundamental principles for sound land administration and good land governance has been done by different UN bodies as well as by NGOs, the World Bank and academia. However, it has often proven to be difficult to turn this into political principles or agendas. This is where Committee of Experts can make a difference.

7.0 Land Information for Sustainable Development

Increasingly decision makers have come to recognise the value and importance of land information (by extension the cadastre, parcel information, ownership valuation and related information- land use, land development etc.) as fundamental components to attaining sustainable development objectives of, economic development, social justice, environmental management and good governance. See Figure 1, for a global land

management perspective. This has been fuelled by the ability to integrate disparate datasets and leverage data analysis across various functional areas and business processes.

Sound land administration systems linked to geospatial data deliver a range of benefits to society in terms of: support of governance and the rule of law; alleviation of poverty; security of tenure; support for formal land markets; security for credit; support for land and property taxation; protection of state lands; management of land disputes; and improvement of land use planning and implementation. The systems enable the implementation of land policies to fulfil political and social objectives and to achieve sustainable development.

Geospatial data has wide ranging application. This covers current work items of the Committee of Experts such as: the global geodetic reference frame; legal and policy frameworks; integration of geospatial, statistical and other information; and the implementation and adoption of standards. These have clear linkages to sustainable development and the Post-2015 development agenda. Geospatial information can provide the integrating factor to propel the move of land information into non-traditional areas of application – social, economic and environmental – which augurs well for the strengthening and development of national spatial data infrastructure initiatives. For the needs of the Post-2015 development agenda, geospatial information is able to support the following goals and targets:

Proposed Goal	Language on Targets in OWG 13
<p>Proposed goal 1. End poverty in all its forms everywhere</p>	<p>Target 1.4 by 2030 ensure that all men and women, particularly the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership, and control over land and other forms of property, inheritance, natural resources, appropriate new technology, and financial services including microfinance</p>
<p>Proposed goal 2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture</p>	<p>Target 2.3 by 2030 double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment</p>

Proposed Goal	Language on Targets in OWG 13
	<p>Target 2.4 by 2030 ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality</p>
<p>Proposed goal 5. Achieve gender equality and empower all women and girls</p>	<p>Target 5.a undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance, and natural resources in accordance with national laws</p>
<p>Proposed goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable</p>	<p>Target 11.1 by 2030, ensure access for all to adequate, safe and affordable housing and basic services, and upgrade slums</p>
	<p>Target 11.a support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning</p>
<p>Proposed goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p>	<p>Target 15.3 by 2020, combat desertification, and restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation neutral world</p>
<p>Proposed Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels</p>	<p>Target 16.3 promote the rule of law at the national and international levels, and ensure equal access to justice for all</p>

The operational component of the land management concept is the range of land administration functions that 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).

These 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 environment. Ultimately, the design of adequate systems of land tenure and land value should support efficient land markets and adequate systems of land use control and land development should lead to effective land use management. The combination of efficient land markets and effective land use management are seen as a key component in delivering economic, social and environmental sustainability. This is demonstrated in Figure 1 below:

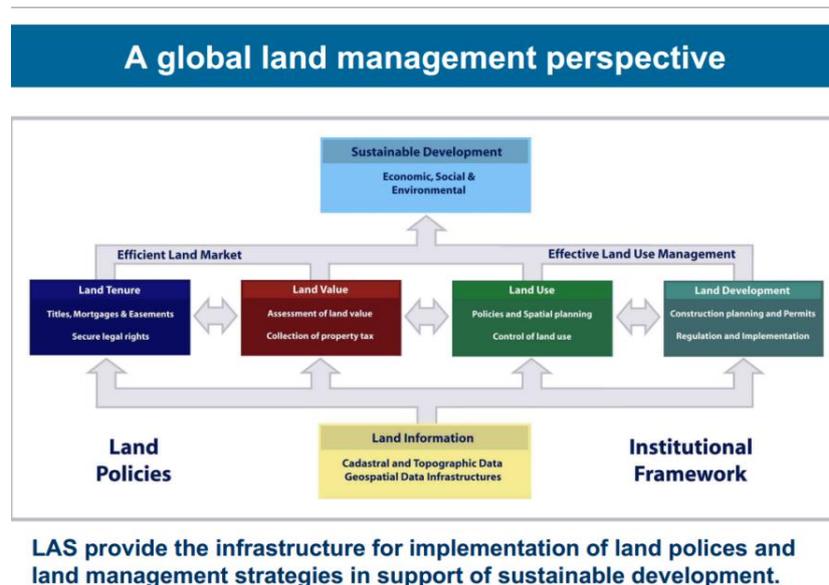


Figure 1: A Global Land Management Perspective ((Williamson et.al. 2010)

Whereas this approach is used in developed countries, because of the gaps described above in developing countries, this approach has to be adapted for developing countries. Figure 2 below shows the adapted version within a fit-for-purpose land administration framework. This approach will also allow the universality expected by the Sustainable Development Goals. It will allow data acquisition for reporting on the Sustainable Development Goals across both developing and developed countries using both geospatial data and other forms of data.

Figure 2 highlights the centrality of pro-poor land records to the land information infrastructure of the vast majority of developing countries. It is complementary to figure 1 above as it consists of 10 design principles: 1) Assessment of national and local

political economy conditions; 2) Build on community social tenure practices; 3) Introduce formalization and a land officer; 4) Recordation (systemisation); 5) Land records, indexes and a record keeper; 6) Inspection; 7) Multiple sources of evidence; 8) Dispute resolution; 9) System ownership by state and community; and 10) Emphasis on continuum of land recording. These principles also underpin the design of the conventional systems of land administration found in more developed contexts.

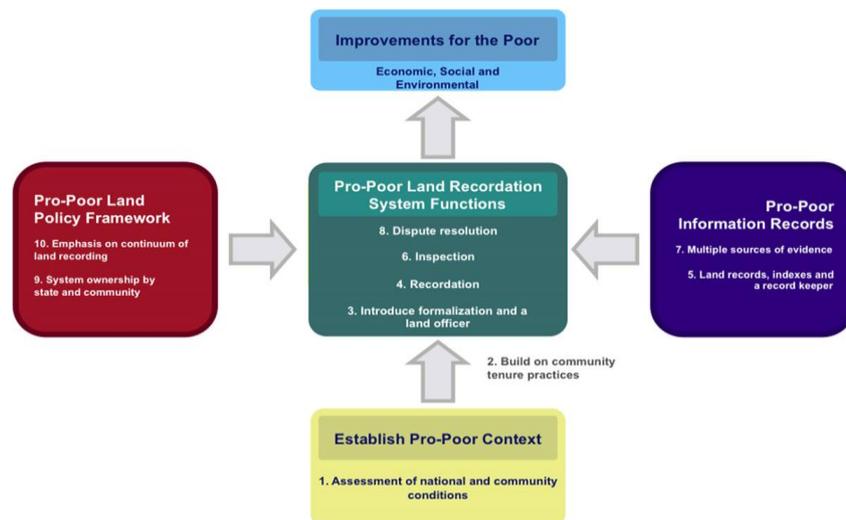


Figure 2: The 10 design elements of the pro-poor land recordation system (Zevenbergen et al, 2012)

As demonstrated above, land information underpins a multiplicity of applications supporting health delivery, all forms of taxation, environmental management, emergency response, infrastructure and utilities management and the staging of censuses and elections.

For the Post 2015 Sustainable Development agenda to be realized, , countries need to be able to model, measure and report on the SDG goals which aspire the creation of the 'Future We Want'. This is made possible with the use of parcel data in conjunction with other geospatial data sets, as well as other non-geospatial data sets such as a range of spatial units.

The Post 2015 Development agenda creates an opportunity for the use of geospatial data other forms of spatial data in reporting on goals and targets as demonstrated in Figure 3 below.



Figure 3: Application of geospatial and spatial data acquisition methods to the Sustainable Development Goals

Figure 3 above explains geospatial and spatial data acquisition methods which will be needed for reporting by countries on the SDGs and which will help Member States to achieve the goals and targets set by the Post 2015 Sustainable Development Goals. The data acquisition methods will be linked to the land/land registration, the land administration domain model, the social tenure domain model, mapping by national agencies and non-governmental bodies including participatory mapping. Both conventional and fit-for purpose land administration will be needed to supply the data for these reports based on the indicators that will be prescribed.

In the present language as proposed by the two lead UN agencies UN-SDSN and UN Stats, two sets of indicators have been proposed for the goals and targets on land relating to land tenure. The proposed indicators do not have a lot of variance. This does not only give an indication of agreement on the language on land indicators for the SDG

process, but the recognition of fit for purpose land administration through the recognition of a range of rights to land.

The UN- SDSN Indicator 5 is now formulated as follows.

Percentage of women, men, indigenous peoples, and local communities with secure rights to land, property, and natural resources, measured by (i) percentage with documented or recognized evidence of tenure, and (ii) percentage who perceive their rights are recognized and protected.

The UN Statistics Division has proposed the following indicators for Target 1.4

“By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.”

Proposed Indicator 1: Proportion of population/households with access to basic services (to be defined) by sex and age group

Proposed Indicator 2: Proportion of adult population with tenure that is legally recognised and documented or perceived as secure, by sex and age group.

The Committee of Experts should therefore play a critical role in supporting Member States to prepare for reporting for the Sustainable Development Goals through institutional strengthening, capacity development and best practice development.

8.0 Potential Areas of Focus to be Considered by the Committee of Experts.

A substantive area of work to be addressed by the Committee of Experts is collective advocacy for the increased use of geospatial information to support the monitoring of the Sustainable Development Goals. Furthermore, geospatial information can be used to create global awareness of the problems associated with state/public and private land and its management, in addition to encouraging the implementation and tracking of land polices and adoption of appropriate enabling technologies, standards and best practices.

Other potential areas of focus:

1. Create awareness and generate synergies among land governance initiatives and public sector reform for purposes of delivering on the Sustainable Development Goals.
2. Advocate for greater global awareness for the need to collect and maintain accurate, assured and authoritative land/geospatial information.

3. Develop guiding principles for international cooperation (based on good practices)
 - a. Compendium on public land legislation
 - b. Public Land Management Practice guide for implementation
4. Exchange of experience by Member States, north south collaborations and technical partnerships for project design (Land projects including “all land” and by “all land” it includes the seas and any structures thereon) to undertake institutional strengthening for the reporting on the Sustainable Development Goals.
5. To increase awareness and visibility of geospatial and fit for purpose land administration methods of data acquisition for the SDG goals.
6. To strengthen Member States in the assessment, development and implementation of geospatial tools and fit-for-purpose land administration.
7. Knowledge management: update statistical information and analysis on property.
8. Collaboratively collect, integrate, manage and disseminate geospatial and land data with socio-economic and environmental data to support to underpin good governance of land, public safety and security, the wellbeing of societies, the environment and economies.
9. Maintenance and use of existing monitoring tools, taking into consideration those developed by the World Bank – Land Governance Assessment Framework and the FIG/University Melbourne, UN-GGIM Asia and the Pacific Cadastral template.
10. Provide capacity development and institutional strengthening.
11. Promote action research on specific topics.
12. Collation and dissemination of information on the activities, guidelines and recommendations of other United Nations and other bodies and best practices demonstrated by countries. In doing this, it might be relevant that Committee of Experts synthesizes the various recommendations and practices into a form suitable for politicians and decision makers.

ANNEX I Land Administration and Management Initiatives

Contributions to land administration were elevated with the 8th Regional Cartographic Conference for Asia-Pacific in 1977, which called for the creation of an advisory panel on cadastral surveying and mapping. The subsequent conference in 1980 had resolutions on capacity development for cadastral mapping, cadastral survey systems and national land information systems.

Further to those early interventions, in October 1999 in Bathurst, Australia, an international group of experts participated in the Bathurst Workshop on Land Tenure and Cadastral Infrastructures for Sustainable Development, organised by the United Nations Statistics Division with support from FIG. The Workshop proposed a number of recommendations and specific activities such as; the need to increase knowledge of the global situation of land administration and land tenure, for the United Nations to undertake a study of global land administration issues, (such as the range of tenure issues, gender, urban agglomeration, land disputes problems and indicators) with a view to producing a global atlas and related documentation.

The Bathurst Declaration called for a commitment to provide effective legal security of tenure and access to property for all men and women, including indigenous peoples and those living in poverty or other disadvantaged groups. It identified the need for the promotion of institutional reforms to facilitate sustainable development and for investing in the necessary land administration infrastructure. Some of these activities have been completed and others are ongoing, spearheaded by a variety of United Nations and international bodies. Notwithstanding the many interventions, the key issue of securing tenure for those in the developing world remains an insurmountable challenge. The following paragraphs highlight recent initiatives in continuance of the drive towards sustainable development through secure land and property rights for all, with sound land administration and management.

In April 2011 at the Governing Council of the United Nations Human Settlement Program, there was the landmark resolution on “**Sustainable urbanization through equitable access to land, housing, basic services and infrastructure**”. The Resolution affirmed the *Continuum of Land Rights*, which includes rights that are documented as well as undocumented, from individuals and groups, from pastoralist and informal settlers, which are legal as well as extra-legal and informal. Rights to land must be viewed as lying on a continuum.⁹

The focus on land continued and in February 2012, in Malaysia, the Permanent Committee on GIS Infrastructure for Asia and the Pacific (now UN-GGIM for Asia and the Pacific), the Global Spatial Data Infrastructure Association (GSDI) and FIG issued ***the Kuala Lumpur Declaration on Spatially Enabled Government and Society***. This was a call for “spatial enablement”, global action to leverage geospatial data to support governments and wider society to make better and more informed policy decisions. Further, it reiterated the need for adding location to all existing information to unlock the wealth of knowledge on social, economic and environmental matters, to address challenges across the world. Central to the Kuala Lumpur Declaration was the need to manage all information spatially while recognising that information must be collected, managed and disseminated together with information on land ownership and custodianship to

⁹ Handling Land, UN Human Settlement Programmes, 2012

underpin good governance of land, public safety and security, for the wellbeing of societies, the environment and economies.

Further in May 2012, at the United Nations Committee on World Food Security there was a historic international agreement on the governance of tenure, the **Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests**. The Guidelines outlined principles and practices that governments can refer to when making laws and administering land, fisheries and forest rights. It is a historic breakthrough that countries have agreed to these first-ever-global tenure guidelines, particularly in the administration of tenure and specifically in areas such as the recording of tenure rights, valuation, taxation, spatial planning as well as issues and responses that is required in the recognition and protection of access and rights. At a technical workshop convened by United Nations Food and Agriculture Organization (UN-FAO) on the implementation of the Voluntary Guidelines, FIG observed an urgency and an immediate challenge in the building of an up-to-date, credible, comprehensive and authoritative inventory of land (and the seas) that include information on tenure, custodianship and ownership.

Later that year, in December 2012, the **Land Administration Domain Model (LADM)** as a standard was published by the International Organization for Standardization as ISO 19152:2012. LADM stimulates the development of software applications and accelerates the implementation of proper land administration systems in support of sustainable development. The LADM covers basic information related components of land administration including location. The LADM defines terminology for land administration that allows a shared description of different formal, customary or informal tenures. This standard contributes to improving land tenure governance, including access to information contributing towards secure land and property rights for all.

A subsequent call for action, inclusive of revised approaches to address long outstanding land administration issues was made in March 2014, with the joint FIG, World Bank Declaration on **Fit-For-Purpose Land Administration**¹⁰. This concept is crucial, declaring that land administration should be designed to meet the needs of people and their relationship to land, to support security of tenure for all and to sustainably manage land use and natural resources. It calls for a flexible and pragmatic approach rather than requirements imposed through rigid regulations, demands for spatial accuracy and technologies that may be unsustainable for lesser-developed jurisdictions dependent on donor funding. It called for flexibility that allows for land administration systems to be incrementally improved over time, should it be found necessary. A fit-for-purpose approach will ensure that appropriate and sustainable land administration systems are built within a relatively short time frame and at affordable costs. This approach should facilitate economic growth, social equity and environmental sustainability. The declaration is annexed hereto and marked Annex II.

Another call for action was the Third High Level Forum on United Nations Global Geospatial Information Management held in Beijing China 22-24 October 2014. The **Beijing Declaration on Sustainable Development with Geospatial Information** called for the creation of geospatial information and products which are innovative, affordable and fit-for purpose solutions to

¹⁰ FIG/WB (2014): Fit-For-Purpose Land Registration. FIG Publication No. 60

realize the Secretary General's vision on '*Realising the World we Want for All*' and to support measurement and monitoring of SDG targets and indicators consistently over space and time. Also to specifically support the development of fit-for purpose land administrations and geospatial information approaches in developing countries.

This builds on the work of the FAO's led **Voluntary Guidelines on Responsible Governance of Tenure, Land, Fisheries and Forests in the context of Food Security** (2012), and the **Land Governance Assessment Framework** of the World Bank and UN-Habitat Governing Council resolution on Sustainable Urban Development through expanding equitable access to land, housing, basic services and infrastructure where alternative land administration approaches are encouraged (GC23/17:2011). However the issues remain a global concern particularly in developing countries as stated in the "*Future we Want*" (Rio+20 Outcome Document: 2012) that land is fundamental to address urban and rural challenges and it cuts across all sectors. These include dealing with governance and legislation, poverty, agricultural productivity, climate change, zero degradation and security as well as dealing with post-conflict and post-disaster contexts, gender, youth and human rights issues.

The UNEPLive is a cutting-edge, dynamic new platform to collect, process and share the world's best environmental science and research. It was launched in January 2014, UNEP Live provides data access to both the public and policy makers using distributed and decentralized networks, cloud computing, big data resources and improved search functions. UNEP Live is the knowledge base for global environmental policy-making and evidence-based analysis. It supports the streamlining of national monitoring, reporting and verification of data for global and regional environmental goals. Its wealth of geospatial data, as well as various interactive tools (including on-demand map preparation), lend itself to multiple uses and stakeholders. UNEPLive draws together information on land and natural resources from credible and verifiable data providers (www.unep.org/uneplive).

The National Reporting System (NRS), housed in UNEPLive, helps countries to easily and quickly create, update and publish data and related for an integrated environmental assessment addressing all three dimensions of sustainability. It contains at least 60 indicators regularly reported on by 158 countries today, with expectations of more capacity being built. It provides policymakers with quick, up-to-date graphical and geospatial snapshots of relevant indicators.

Land administration in Africa, particularly sub-Saharan Africa has presented a variety of challenges given its historical, social, political and cultural diversity. This has led to significant attention and work by policy makers and development agencies across the continent; one such intervention created the Land Policy Initiative. This is a joint programme of the tripartite consortium consisting of the African Union Commission (AUC), the African Development Bank (AfDB) and United Nations Economic Commission for Africa (ECA). Its purpose is to enable the use of land to lend impetus to the process of African development with a vision for a peaceful and prosperous Africa through equitable access, efficient and sustainable utilization of land.

ANNEX II Contributors to the Preparation of the Discussion Paper

It is recognised that many organisations and Member States have and are working on and studying this topic, and therefore a large body of work, examples, and results exist on the subject. The following persons and entities are acknowledged for their contribution to this paper.

United Nations system

- i. HABITAT, GLTN – Global Land Tool Network
- ii. United Nations Environment Programme (UNEP),
- iii. FAO, Land Tenure and Management Unit

International Bodies

- iv. Teo Chee Hai – Past President FIG, Malaysia

Other Organisations Working on Land Administration/Governance

- i. World Bank
- ii. UNDP
- iii. UN Economic Commission for Europe (UNECE) - Committee on Housing and Land Management - Working Party on Land Administration
- iv. UN Economic Commission for Africa (UNECA) and the Africa Land Policy Initiative
- v. UN Economic Commission for Asia and the Pacific (UNESCAP) - Sustainable Urban Development, Environment & Development Division

Non-Government Organisations

- Slum Dwellers International
- Huairou Commission
- Oxfam International
- Lincoln Institute of Land Policy
- International Land Coalition
- Bill and Melinda Gates Foundation
- Omidyar Network

ANNEX III FIG-World Bank Declaration on Fit-For-Purpose Land Administration

There is an urgent need to build cost-effective and sustainable systems that identify the way land is occupied and used and accordingly provide for secure land rights. When considering the resources and capacities required for building such systems in less developed countries, the concepts of mature, sophisticated systems as predominantly used in developed countries may well be seen as the end target, but not as the point of entry. When assessing technology and investment choices, the focus should be on a “fit-for-purpose approach” that will meet the needs of society today and that can be incrementally improved over time.

A fit-for-purpose approach includes the following elements:

- **Flexible** in the spatial data capture approaches to provide for varying use and occupation.
- **Inclusive** in scope to cover all tenure and all land.
- **Participatory** in approach to data capture and use to ensure community support.
- **Affordable** for the government to establish and operate, and for society to use.
- **Reliable** in terms of information that is authoritative and up-to-date.
- **Attainable** to establish the system within a short timeframe and within available resources.
- **Upgradeable** with regard to incremental improvement over time in response to social and legal needs and emerging economic opportunities.

A country’s legal and institutional framework must be revised to apply the elements of the fit-for-purpose approach. This means that the fit-for-purpose approach must be enshrined in law and that the information be made accessible to all users.

A fit-for-purpose approach will ensure that appropriate land administration systems are built within a relatively short time frame and affordable costs. The systems allow for incremental updating and upgrading. This approach will facilitate economic growth, social equity and environmental sustainability to be better supported, pursued and achieved.

March 2014

World Bank, Washington DC

ANNEX IV ACRONYMS

FAO	Food and Agriculture Organization
FIG	International Federation of Surveyors
GLTN	Global Land Tool Network
GNSS	Global Navigation Satellite Systems
ICT	Information and Communications Technology
IPPC	Intergovernmental Panel on Climate Change
NGO's	Non-government organizations
OWG	Open Working Group
SDG	Sustainable Development Goal
UNCTAD	United Nations Conference on Trade and Development
UNDESA	United Nations Department of Economic and Social Affairs
UN-DSD	United Nations Division for Sustainable Development
UNECA	United Nations Economic Commission for Africa
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic Commission for Asia and the Pacific
UNFPA	United Nations Population Fund
UN-GGIM	United Nations Committee of Experts on Global Geospatial Information Management
UN-Habitat	United Nations Human Settlements Programme
UNSD	United Nations Statistical Division
WB	World Bank

ANNEX V References

1. Bell, K.C., 2009, Trends in Land Administration and Management with Particular Reference to World Bank Support for Projects in East Asia Region. 7th FIG Regional Conference Hanoi, Vietnam 19-22 October 2009.
2. FAO (Food and Agriculture Organisation) 2002. “*Land tenure and rural development.*” FAO Land Tenure Studies No. 3, pg. 14
3. FAO (Food and Agriculture Organisation) 2007. “*Good Governance in Land Tenure and Administration*”. FAO Land Tenure Studies No. 9, Rome.
1. FIG. 1999. *Bathurst Declaration on Land Administration for Sustainable Development*. International Federation of Surveyors.
<http://www.fig.net/pub/figpub/pub21/figpub21.htm>. Accessed 23 January 2015
2. FIG/WB (2010): Land governance in Support of the Millennium Development Goals - a new agenda for land professionals. GIG Publication No. 45, FIG Office, Copenhagen, Denmark. <http://www.fig.net/resources/publications/figpub/pub45/figpub45.pdf>. Accessed 6 February 2015
3. FIG (2012). *Spatially Enabled Society*. Edited by Daniel Steudler and Abbas Rajabifard, Fig Publication No. 58, ISBN978-87-90907-97-6
4. FIG Publication No. 58, *Spatially Enabled Society*, edited by Daniel Steudler and Abbas Rajabifard, April 2012
5. FIG/WB (2014): *Fit-For-Purpose Land Registration*. FIG Publication No. 60
6. Lugoe, F.N (2007). “*Overwhelming Challenges to Land Administration, Settlements and Livelihoods in Tanzania*”. Proceedings, CASLE Conference on Housing and Livelihoods. Mukono, Uganda.
7. McLaren, R, and Stanley V., Module 14: ICT for Land Administration and Management, ICT in Agriculture Sourcebook – Connecting Smallholder to Knowledge, Networks and Institutions (Section 4 – Improving Public Service Provision)
<http://www.ictinagriculture.org/content/ict-agriculture-sourcebook>. Accessed 23 January 2015
8. UNECE (United Nations Economic Commission for Europe). 2005. *Land Administration in the UNECE Region, Development Trends and Main Principles*. Geneva.
9. UN-Habitat, 2012. *Handling Land: Innovative Tools for Land Governance and Secure Tenure*, UN Human Settlement Programmes
10. Williamson, I, Enemark, S, Wallace, J. and Rajabifard, A. 2010. *Land Administration for Sustainable Development*. Redlands: ESRI Press
11. Williamson, I, 2007. “*Global Challenges for Land Administration and sustainable Development*”. Lincoln Institute of Land Policy.
http://www.lincolninst.edu/pubs/dl/1239_Williamson_Final.pdf Accessed 19 January 2015