UN-GGIM Expert Group on Land Administration and Management

Expert Group Meeting, Delft, The Netherlands
14 & 15 March, 2017

BACKGROUND DOCUMENT

The Delft Expert Group Meeting

This two-day meeting of the UN-GGIM Expert Group on Land Administration and Management (UN-GGIM: EG-LAM) is hosted by the Government of The Netherlands through Kadaster International of The Netherlands in Delft on March 14 & 15, 2017. This physical meeting is a working meeting where members of the Expert Group together with invited experts are expected to work together towards tangible outcomes and deliverables expected by the UN Committee of Experts on Global Geospatial Information Management.

The Delft Meeting is by invitation only and all current 27 members of the Expert Group comprising of expert representatives from UN member states, UN systems, multilateral and international organisations are invited to participate. The Government of The Netherlands and Kadaster International may also invite national, regional and international experts to this meeting.

This two-day meeting precede the workshop organised by the Global Land Tool Network (GLTN), the International Standardisation Organisation (ISO), the Open GeoSpatial Consortium (OGC), the Royal Institute of Chartered Surveyors (RICS) and the International Federation of Surveyors (FIG) on 16th and 17th of March 2017.

The Delft Expert Group Meeting aims to discuss and consider:

- the development and use of globally comparable methodology, domain standards and tools exploiting partnerships and innovative technologies to meet the demands for land and tenure data by the SDG global indicator framework;
- timely and reliable fit-for-purpose land and geospatial information including fundamental land data theme required for good land governance and effective land administration; and:
- providing an overview of the spatial distribution of tenures (with reference to the continuum of land rights) through visualisation of tenure systems and legitimate rights, formal and informal, legal and extra-legal, to better inform and monitor status.

It should be noted that the following week, from March 20th till March 24th the 18th edition of the annual World Bank Land and Poverty Conference will be held in Washington D.C., USA and in that same week the OCG will organise its Technical and Planning Committee Meeting in Delft, The Netherlands.

1. Introduction

Land information tells us about the ownership, use, value and development of land – whether statutory, informal or customary. Many of those relations are neither recognised nor documented. There is no inclusiveness for all. Meanwhile, populations and cities are growing and the pressure on land and natural resources is continuing to increase and in some instances, significantly. This leads to disputes and also conflict.

Land information provides an overview of people-to-land relationships. It shows us how people relate to the space around them. The information can be used to realise responses to major societal and developmental challenges including attaining the United Nations 2030 Agenda for Sustainable Development.

Land administration develops and improves over time, the pace at times dictated by rate of change in technology as much as societal demands. In many places, land administration is under developed and the reasons for such a situation is complex, and can be institutional setup, complex regulations and procedures, lack of capacity and political support.

However, recent advances in geospatial science and technologies meant that land administration systems can be incrementally progressed or modernised to provide for and to secure land and property rights for all. As an example, for the first time in history it is now possible to record the geometry of people's relationship to land. This information is vital to record, document and recognise the billions of interest in land. These spatial units of interest in land informs the people-to-land relationship, information that will not lead to more effective and efficient land administration and management, but also evidence-based policy making and decisions and sustainable development. From the geospatial perspective, many tools are already available to support and enhance this progress, *but further steps are needed to operationalise them at scale. This development requires a push from policy level based awareness, needs and requirements, resources and capacity and ease to implement.*

The global importance of geospatial information was recognised by the United Nations when in July 2011 the Economic and Social Council (ECOSOC), recognizing the urgent need to take concrete action to strengthen international cooperation in the area of global geospatial information management, established the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM). As the peak inter-governmental mechanism to make joint decisions and set directions on the production and use of geospatial information within national and global policy frameworks UN-GGIM also provides the forum for Member States to strengthen the geospatial information management capacities of developing countries for better policy making at national, regional and global levels.

We also need to be reminded that the 2030 Agenda for Sustainable Development is a universal and transformative agenda that aims to improve the wellbeing of people and planet in our lifetime. The 2030 Agenda specifically recognizes the need for new data acquisition and integration approaches to improve the availability, quality, timeliness and disaggregation of data to support the implementation of the new development agenda at all levels, including to exploit the opportunities availed by a wide range of data, including geospatial information. Maximizing the value of fundamental geospatial information including land information at the national and sub-national levels to capture elements of the 2030 Agenda, for informed policy-making, decisions and actions is going to be critical. *Such national bottom up approach can only be achieved within the time framework of the 2030 Agenda if standards are available. Hence the urgent need and requirement for the development of standardised, but flexible, easy to use, affordable and transparent approaches in land administration and management.* Standardisation is a strategic issue in national information systems where information management is the key primary process.

2. Land and tenure data for the 2030 Agenda and its global indicator framework

Identifying fit-for-purpose land data and providing timely and reliable land and geospatial information

A Fit-For-Purpose approach for Land Administration has been developed by global stakeholders. It is a gender sensitive, transparent and highly participatory approach. With the support of geospatial technologies this approach can be implemented quickly. This approach is recognised and affirmed in the Addis-Ababa Declaration 'Geospatial Information Management towards Good land Governance for the 2030 Agenda'. In this declaration, the need for standardisation is underlined.

The Fit-For-Purpose approach argues for cost-effective, time-efficient, transparent, scalable and participatory systems. The philosophy is driven by the idea that, in many situations, it is sufficient, for example, to identify visual boundaries based on imagery. This means making use of photographs, images or topographic maps in boundary adjudication and mapping activities. Alternatively, apps on mobile devices can be combined with imagery to identify one's occupancy or use of land, thus avoiding misinterpretation of visual boundaries on the image. Images can be collected from satellites, traditional aircraft or unmanned aerial systems (UAS). In cases where values of land is high or of intensive land use, conventional field surveys using high-precision instrumentations may be deployed. Imagery can be used for many purposes, for example interaction between government and citizens and business, and not merely for the adjudication of boundaries or limits.

Alongside the push for the increased use of imagery, global standards such as the Land Administration Domain Model (LADM) and its specialisation the Social Tenure Domain Model (STDM) focus on standardised modelling of information at the conceptual level. These models do not include land administration processes for initial data acquisition, data maintenance and data publication. This is because these processes were considered to be country-specific when the first edition of LADM was prepared; a generic and global approach was likely to be difficult to model. This view may now need reconsideration.

The fit-for-purpose land administration approach arguably allows for identification of more generic process-related modules in data acquisition and data handling. Standardisation can also make it easier to monitor the progress of global indicators relating to land tenure security.

Standardisation does not mean loss of flexibility. It supports structuring data in single and distributed land administration environment. A set of so called 'code tables' allow the inclusion of, for example, a broad range of (local) types of recognised land rights, types of restrictions, types of responsibilities, types of holders, types of spatial units (text, point, line, polygon and volume based).

Computerising large sets of legacy data (maps and archives) requires analogue-to-digital conversion processes, geo-referencing and linking to digital data from other sources. Such data, for example, may be used for taxation, tenure security purposes, slum upgrading, city management, to highlight a few. This also includes land use and zoning plans implemented by land consolidation and land readjustment processes. Statistical information such as fragmentation index and price index may need to be derived from the land administration system.

Interoperability, data sharing and data integration

The Open Geospatial Consortium (OGC) recognises that worldwide, effective and efficient land administration is an ongoing concern, inhibiting economic growth and securing land and property rights extensively. Existing approaches are at significant risk of data loss and failure due to, for example, disasters and lack of interoperability. The charter members of an established OGC Land Administration Domain Working Group are seeking to identify enabling standards and best practices to guide countries in a programmatic way towards establishing more cost-effective, efficient and interoperable land administration capabilities. Attention will be paid to upgrading currently manual

processes to semi-automated ones, and to suggest new approaches for data acquisition that are more automated and flexible. These challenges are faced today in both 'developing' and 'developed' countries alike.

Interoperability, data sharing and data integration will be needed going forward and examples include initial data acquisition, geo-referencing, identification/adjudication of boundaries, surveying (based on imagery, conventional surveys, UAVs, digital pens for imagery and handwriting, feature extraction/data cleaning, etc.), area management, linking rights, restrictions and responsibilities (RRRs) to spatial units, linking (groups of) persons to (shares in) RRRs, public inspection, check on complete coverage, reporting land disputes, request for information, publication of land data, provision of products and services, formalisation, map renovation and quality improvement and digital archiving.

Providing timely and reliable land and geospatial information in areas where land administration is under developed will require comprehensive logistic and organisational support – with grass root surveyors and other data collectors. 'Cadastral intelligence and cognizance' in relation to use and maintenance has to be developed in communities and amongst citizens. Providing timely and reliable land and geospatial information in areas where land administration is developed finds other requirements – development of 3D cadastre, inclusion of marine spaces, linking up with building information modelling and 3D city management for mega cities. This is relevant for developed and developing countries.

Data sharing means the data are collected once and used many times. Duplicative efforts in data collection and maintenance can be avoided. Data are 'kept to the source'. A considerable amount of national resources can be conserved but also requires an increasing ICT effort – but the perception is that this effort is easier when implementing from scratch then from legacy automated systems.

3. Globally comparable standards for land and tenure data for Global Indicator Framework

Land/tenure Data and ISO 19152

Standards like the Land Administration Domain Model (LADM) are crucial to jump-start new initiatives and are connecting top-down and bottom-up projects together. It is very important that there is awareness of this at policy level. Policies should support the implementation of standards particularly when such standard are globally agreed.

The LADM facilitates the efficient set-up of land administration and can function as the core of any land administration system. LADM is flexible and widely applicable. LADM is of one of the first spatial domain standards. Apart from the Continuum of Land Rights there is also a continuum of accuracy, of land recordation, of types of spatial units, of types of parties involved, and of data acquisition approaches.

All this is supported within LADM – allowing for a flexible, systematic and incremental approach in the development of a land administration and management system catering to the needs, priorities and requirements of users and society – including a focus on the needs of the poor. In this context attention should be given to issues such as: participatory maintenance of an informal land administration practices; unconventional transactions (for example formalising informal land use and legalising women's land rights or shares in land rights); conversion of land rights after review (from recordation to registration) and strategies for data protection and for IT development (with a focus on keeping systems running).

Development of a second edition of the LADM is scheduled for the coming years within ISO TC211, with input from stakeholders. This includes expansion of the RRR functionality; 3D Cadastre (mining, marine, underground utilities, complex buildings and constructions), link to topographic

information (IndoorGML, InfraGML, LandXML, CityGML, BIM/IFC, etc.). In this development, attention to processes in land administration (data acquisition, data maintenance, data sharing) is relevant in the development of operational standards.

The marine environment (administering marine spaces and marine cadastre) may be included in LADM. A thought is that the marine environment is a related domain – similar to valuation/property taxation, buildings registrations, land use/land cover, mining and extractive licence register, archaeology and heritage cadastre, spatial planning zones (restrictions), road cadastre, physical utility networks, address registrations. The important aspect is that of 3D in many of these domains and these can only useful and integrated when there is interoperability, standards based datasets, within all related and varied domains.

OGC land administration domain working group

The linking of people, business and industry, economy and environment to a place or geographic location can result in a better understanding of social, economic and environmental realities and challenges to support policy formulation, decision making and citizen centric delivery systems. This implies availability of well-maintained links between geospatial datasets, land information and other 'basic' or 'key' or "fundamental" datasets.

The ISO 19152 Land Administration Domain Model (LADM) provides an extensible basis for efficient and effective development based on a model driven architecture (MDA), and enables involved parties to communicate based on the shared ontology implied by the model. As it is already difficult within one domain (such as land administration) to agree on the used concepts and their semantics, it will be even more difficult in case of dealing with other and linking to other domains. However, we cannot avoid this if a meaningful interoperable information infrastructure has to be developed and implemented.

It is crucial that the importance of operational standards in land administration is recognised and supported at policy level. Otherwise they will not be implemented. Land administration itself is based on standards – which can be sub-national, national or global. It is recognised that there should be options, perhaps a variety of options, for the inclusion of different types of rights, right-holders and spatial units. But the information infrastructure in which those data becomes available should be similar everywhere. This allows efficient communication between data sets managed by different systems. This also supports to performance measurement, progress monitoring, data protection etc.

The Open Geospatial Consortium (OGC) has set up a land administration domain working group. This OGC initiative was prepared and discussed during the World Bank Conference on Land and Poverty in 2016. OGC has standing liaisons with major players in the land administration domain, including Technical Committee 211 of the ISO (this committee of the International Standardisation Organisation deals with geographic information), the Royal Institution of Chartered Surveyors, the World Wide Web Consortium, OASIS, the International Federation of Surveyors, and the Global Land Tool Network. OGC strives to use, build on and complement existing standards. However, while there are some standards describing elements of an administrative system, such as in LADM, there might be gaps in the way that they incorporate geographic descriptions of land records, and/or inadequate rules for defining and describing the quality of the records. The OGC Land Administration Domain Working Group aims to assess the existing standards and address any gaps it finds.

The OGC members drafted a charter for a land administration domain working group and in the draft there is particular emphasis on the low- to middle-income countries, which is where most challenges in land administration and management exist today. The charter describes how to improve the interoperability, effectiveness and efficiency of land administration systems by optimising the use of OGC and complementary open standards. Land administration activities in all countries can benefit from improved interoperability. Improved interoperability contributes to

efficiency and effectiveness, reduce resource consumption through, among others, reduced deployment time, lower system lifecycle costs, improved flexibility and scalability, improved choice from the IT marketplace, and improved ability to share, exchange and integrate information related to land administration.

The domain working group will examine the land administration process from the land survey organisations, up through jurisdictional levels. This will be done with partner organisations across industry, development agencies and others where necessary. The group will further work to provide a common vocabulary for the locational aspects of land administration databases, and it will also provide a forum for connecting suitable technology for data linkage and quality assessment.

Processes such as initial data acquisition may concern millions of spatial units where people to land relationships have to be determined. The organisation of this process requires location based support in logistics and case management, utilising appropriate geospatial information.

Data for Measuring and Monitoring

The Global Land Indicator Initiative (GLII) was established under the Global Land Tool Network in 2012 with the aim to support efforts to harmonize monitoring efforts around land tenure and land governance. The GLII seeks to derive a list of globally comparable harmonized land indicators, using existing monitoring mechanisms and data collection methods as a foundation. This initiative supports ongoing global and regional initiatives such as the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (officially endorsed by the Committee on World Food Security in 2012) and Africa's Land Policy Initiative, a joint initiative of the African Union Commission, the African Development Bank and the United Nations Economic Commission for Africa, for example.

The World Bank's Land Governance Assessment Framework (LGAF) can be used for identifying and monitoring sound practise in the land sector. The LGAF is motivated by the fact that land policy analyses and interventions are often fragmented.

It is understood that progress needs to be measured. Indicators are available via the Land Government Assessment Framework and the Global Land Indicators Initiative and these efforts require data as inputs. Standardised (LADM Based) approaches are necessary and can be based on existing tools such as the Social Tenure Domain Model and also that of the National Tenure Atlases.

3D Cadastre

The increasing complexity of infrastructures and densely built-up areas requires a proper recording and registration of the legal status (private and public), which can only be provided to a limited extent by the existing 2D cadastral systems. The registration of the legal status in (complex) 3D situations is needed in 3D-Cadastres. This includes the marine environment.

4. Overview of spatial distribution of tenures

Recognition of legitimate land rights

The Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGTs) promote secure tenure rights and equitable access to land, fisheries and forests as a means of eradicating hunger and poverty, supporting sustainable development and enhancing the environment. "States should recognize and respect all legitimate tenure right holders and their rights. They should take reasonable measures to identify, record and respect legitimate tenure right holders and their rights, whether formally recorded or not;

to refrain from infringement of tenure rights of others; and to meet the duties associated with tenure rights". The 2030 Agenda for Sustainable Development has as a target the "Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure". Also the New Urban Agenda "commit to promote, at the appropriate level of government, including sub-national and local government, increased security of tenure for all, recognizing the plurality of tenure types, and to develop fit-for-purpose, and age, gender, and environment responsive solutions within the continuum of land and property rights, with particular attention to security of land tenure for women as key to their empowerment, including through effective administrative systems". The 'Environmental and Social Performance Standards and Guidance Notes' of the International Finance Cooperation from the World Bank Group, performance standard 5 on 'Land Acquisition and Involuntary Resettlement' also called for a wide range of (recognised) land rights.

Countries need to establish a consultative and participatory process for identifying which rights are legitimate. The VGGTs provide guidance on this process: "Based on an examination of tenure rights in line with national law, states should provide legal recognition for legitimate tenure rights not currently protected by law. Policies and laws that ensure tenure rights should be non-discriminatory and gender sensitive. Consistent with the principles of consultation and participation of these guidelines, states should define, through widely publicized rules, the categories of rights that are considered legitimate. All forms of tenure should provide all persons with a degree of tenure security, which guarantees legal protection against forced evictions that are inconsistent with states' existing obligations under national and international law, and against harassment and other threats".

Visualisation through a National Tenure Atlas

The end result of this recognition process is expected to be a set of categories of legitimate rights officially agreed within the country, which are legitimate under current legislation or proposed revised legislation. A Fit-For-Purpose approach can record and register all rights across a country and create a truly national land administration solution. This process could be tied to the creation of a national digital atlas of tenure types.

This national tenure atlas should provide a complete overview of the tenure systems and land rights related to the areas affected. All formal and informal tenure categories and sub-categories should be identified, and reference to location. Also, land-use planning or other planning processes that may apply restrictions or responsibilities to certain areas can be accommodated. Different authorities have different responsibilities in the process of recording, recognising, registering and managing the various tenure types within different areas such urban and rural. The national tenure atlas is developed to provide an overview of the spatial distribution of legitimate tenure types across a country, e.g. areas of customary tenure, areas of informal tenure, areas of private ownership, state land, etc. This will help to identify where efforts to further document land rights may need to be undertaken, or zoning for better natural resources management, or to enable administration and coordination between state and customary authorities through co-management. The limits of these tenure systems can be fuzzy, visible or fixed and all these can be incorporated into the national tenure atlas.

The atlas may include a layer for national and administrative boundaries, territories of land administration services, a layer for planned and ongoing projects in land administration, a layer for the various types of mapping and scales used for cadastral purposes in the different topographic areas, etc.

5. Fit-For-Purpose Land Administration

Country specific strategies

The Fit-For-Purpose approach is directly aligned with country specific needs, is affordable, is flexible to accommodate different types of tenure, and can be upgraded when economic opportunities or social requirements arise. It is highly participatory, can be implemented quickly and will provide security of tenure for all. Most importantly, the FFP approach can start quickly using a low-risk entry point that requires minimal preparatory work. It can be applied to all traditions in land tenure across the globe.

The country specific FFP strategy for land administration will be based on a country context analysis and the baselines of the existing spatial, legal and institutional frameworks. The analysis will involve identifying the conditions and policies within a country that constrain and shape the way that FFP land administration can be implemented.

This will then be used as a set of guiding principles to create the country specific strategy for building the spatial, legal and institutional framework for implementing FFP Land Administration that will also require provision of capacity development measures as well as country specific manuals for capacity, instructions and implementation.

Data maintenance can be 'programme driven' (systematic) or 'sporadic'. Programme driven means a complete and systematic new acquisition after some time. Sporadic means case by case in a 'transaction driven' way and relates to transactions in the land market (buying/selling, establishment of mortgage etc.). Quality upgrading can be part of the maintenance process. This may be required after digitisation of legacy data or in the case of urbanisation or urban planning. It is crucial that data collected using survey approaches based on differing accuracies can be integrated together. Quality upgrading may also entail integration of 3D cadastral data (this includes integration with standards such as IndoorGML, InfraGML, LandXML, CityGML, BIM/IFC) and marine cadastre.

Developing ISO and OGC open standards in order to improve interoperability, data sharing and data integration

Enabling standards are also being developed with other domain working groups within OGC, such as LandInfra. Partnerships and liaisons with other associations and standards developing organisations (SDOs) will be developed to address interoperability issues that span the land administration community of practice, geographic information systems and the broader IT environment. Examples include linkages with ISO TC 211 regarding the LADM as well as those SDOs responsible for IT standards related to topics such as security, the internet and mobile services. The OGC land administration domain working group will be open to participation by any interested organisations and individuals. Participation and commitment from both the developed and developing countries are required.

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