



Linking Land Tenure and Use for Shared Prosperity

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY
WASHINGTON DC, MARCH 23-27, 2015



THE OPERATIONALISATION OF THE ‘CONTINUUM OF LAND RIGHTS’ AT COUNTRY LEVEL

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**Paper prepared for presentation at the
“2015 WORLD BANK CONFERENCE ON LAND AND POVERTY”
The World Bank - Washington DC, March 23-27, 2015**

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Abstract

The continuum of land rights is widely known and recognised. The continuum has been developed in the first phase of operation of the Global Land Tool Network (2006-2011). In the second phase (2012-2017) GLTN supports (amongst others) tool implementation in targeted countries and/or cities/municipalities. For the implementation of the continuum of land rights at country level a strategy is needed – this paper presents a strategic framework for the operationalisation of the continuum of land rights.

The strategy is based on the concept: categorise, collect, convert. Categorisation involves classification and developing a typology in land rights, tenure types and/or social tenure relations, on the basis of a tenure security assessment at country level. Collect means collecting data related to land rights based on Fit-For-Purpose approaches in Land Administration. Convert means recognition at institutional level – this includes options for formalisation and maintenance at organisational level and information-infrastructure at technical level.

The ISO 19152 Land Administration Domain Model is used as framework for the strategy development (ISO 19152:2012).

Highlights of the proposed strategy for implementation at country level are presented.

Key Words: Continuum of land rights, Social Tenure Domain Model (STDM), Land Administration Domain Model (LADM), Fit-For-Purpose Land Administration

1. Introduction

Securing land rights has been a priority of the international development sector for decades. An often quoted estimate indicates that 70% of the world's people-land relationships are not documented and are outside the formal land administration domain (Augustinus, 2010). Meanwhile, populations and cities grow and the pressure on land and natural resources continues to significantly increase. In the scramble for land it is often the poor who suffer most through evictions, dispossession, disputes, and distrust. Increased tenure security for all can help countries to overcome land, housing and livelihood inequalities; promote food security, entrepreneurship and development; facilitate provision of essential facilities, services and quality of life; reduce physical insecurity and conflict; counter forced evictions, corruption and 'land grabbing'; help overcome widespread discrimination against women; and create options for youth in development.

The security of tenure of people in non-registered areas relies on forms of tenure different from conventional forms. Most off-register rights and claims are based on social tenures. The Global Land Tool Network (GLTN) supports a continuum of land rights, which includes rights that are documented as well as undocumented, formal as well as informal, including individuals and groups, and including pastoralists, slums and settlements which are legal as well as extra-legal. GLTN was formed in 2006 as an alliance of international land actors contributing to poverty alleviation through land reform, improved land management and security of tenure, particularly through the development and dissemination of pro-poor and gender-sensitive land tools. The core themes on which GLTN focuses are: access to land and tenure security; land management and planning; land administration and information; land-based financing; and land policy and legislation. (UN-Habitat/GLTN/IIRR, 2012)

GLTN is now in its second phase of operations (2012-2017). The expected accomplishments of GLTN Phase 2 are:

1. Strengthened land-related policy, institutional and technical frameworks and tools and approaches to address the challenges in delivering security of tenure at scale, particularly for the urban and rural poor;
2. Improved global knowledge and awareness on land-related policies, tools and approaches that are pro-poor, gender appropriate, effective and sustainable for securing land and property rights for all;
3. Strengthened capacity of partners, land actors and targeted countries, cities and municipalities to promote and implement appropriate land policies, tools and approaches that are pro-poor, gender appropriate, effective and sustainable.

The operationalisation of the continuum of land rights at country level is a priority during this second phase of operations. To facilitate this, a strategic framework is being developed. The process of implementation of the continuum can be formulated as 'recognizing, recording, administering a variety of appropriate and legitimate land tenure forms'. This concerns a better recordation and recognition of a diversity of land rights, (social) tenures and resources in integrated information systems. This would require collection as well as formal recognition of the legitimacy of this information (ex-ante or ex-post) and improved conflict resolution systems, a framework and an action plan. If conflicts still have to be solved the information cannot yet be declared legitimate because conflict resolution may have impact on the declared land rights of other parties. For this reason also the collection of information itself has to be legitimate. Administering would require a mandate to a State or social authority resulting in final recognition and publication of all those land rights in one single environment. Note: formal recognition may include administrative recognition – so a new law would not necessarily be required.

The strategic framework elaborated in this report is based on the ISO 19152 Land Administration Domain Model (LADM) (ISO 19152:2012). The LADM facilitates the management of different tenures in one environment, including a continuum of approaches, a continuum in recordation, a continuum of spatial units and subjects (parties). The recognition, support and protection of land rights (meaning tenure security and certainty) for all is a primary focus of the framework developed below. The LADM facilitates the inclusion of overlapping tenures and overlapping land rights. Disputes and conflicts related to land can be represented. The LADM is a conceptual model which can be used for ICT implementations.

The continuum of land rights and its features are briefly described in section 2 of this paper. Section 3 gives a brief introduction of the Land Administration Domain Model and its functionality. Section 4 provides analyses as a foundation for the involvement of the State in the categorisation of land rights. In section 5 a series of implementation aspects is highlighted – categorisation, data collection and conversion aspects. Section 6 gives an overview of the LADM framework. Section 7 presents elements of a draft strategy for implementation of the continuum of land rights approach at country level that is currently under development. This includes, for discussion purposes, recommended strategic actions both for GLTN and for country-level application.

2. The continuum of land rights

2.1 Description

A continuum of land rights refers to the diversity of tenure arrangements in practice, encompassing both de facto and de jure rights. While the rights in this range may not all enjoy the benefits of formal administrative or legal recognition in a particular country, social recognition might be high, lending the de facto rights a local legitimacy. A continuum of land rights can be said to exist when a land information management system includes information that caters for the whole spectrum of formal, informal and customary.

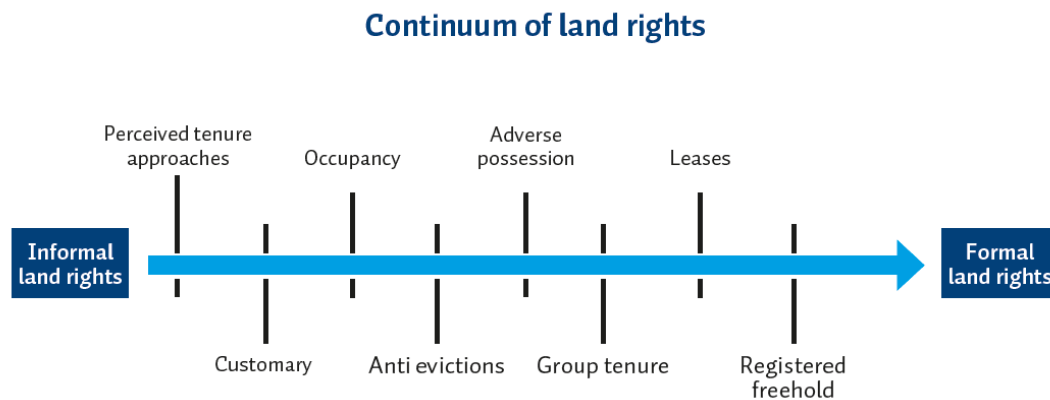


Figure 1 The continuum of land rights (UN-Habitat, 2008)

The continuum of land rights (Figure 1) is a key GLTN concept, which underlies many of GLTN’s tools. In ‘Handling land’ (UN-Habitat/GLTN/IIRR, 2012, p.12) it is described as follows: ‘We can view rights to land as lying on a continuum. At one end are formal land rights, where the owner is an individual, who holds a set of registered rights to a parcel of land that are enshrined in law: the parcel is delineated on a map held in a record office; the owner has the right to occupy the land, build on it (subject to approvals), sell it, rent it out, transfer it to his or her heirs, and prevent other people from coming on to it. At the informal end of the continuum are informal rights: a group of individuals (such as a clan) may have traditional rights to use a piece of land. The boundaries of the land may not be clearly marked on the ground or on a map, and there may be no official paperwork certifying who owns or has what rights to the land. In between these two extremes are a wide range of rights.’ The rights on the continuum are multi-layered and complex: ‘In reality, the rights do not lie on a single line, and they may overlap with one another. Tenure can take a variety of forms, and ‘registered freehold’ (at the formal end of the continuum) should not be seen as the preferred or ultimate form of land rights, but as one of a number of appropriate and legitimate forms. [...] The most appropriate form depends on the particular situation: customary rights, for example, may be superior to registered freehold in certain situations.’

2.2 Features of the continuum

Consensus is emerging that the continuum of land rights approach has the following features:

1. It centres on the management of different land tenures in a single environment (e.g., within a single country),
2. It comprises diversity in land rights, or tenure pluralism, in space and time,
3. The occurring de facto and de jure land rights are appropriate and legitimate; their authority and legitimacy is confirmed by the State or a recognized social entity or 'social authority',
4. It comprises a duality in subjects: right holders move between the rights of the State and the 'social authority',
5. It comprises a plurality of units of measurement because land rights and tenure systems are socially mediated constructs.
6. It provides possibility of movement from one form to the other, in either direction, along the continuum, depending on changing circumstance and/or need.
7. It explicates overlapping authorities and conflicting land claims and calls on the government to solve these in an orderly, political and legitimate way.

Those features can be considered as the foundation for the implementation of the continuum of land rights at country level.

3. The Land Administration Domain Model (LADM)

The LADM is used as the conceptual framework for development of a strategy of the implementation of the continuum of land rights. The LADM can be used at organisational level and institutional level.

3.1 Framework

Implementations of land administration systems are in principle largely the same: they are all based on the relationships between people and land, linked by (ownership or use) rights, and are in most countries influenced by developments in Information and Communication Technology (ICT) (Lemmen, 2012). The Land Administration Domain Model (LADM) is based on the common denominator or the pattern that can be observed in land administration systems: a package of party/person/organisation data and RRR/legal/administrative data and spatial unit (parcel)/immovable object data (Lemmen, 2012). The LADM is flexible, widely applicable and functions as a gathering point of a state-of-the-art international knowledge base on formal land administration (with formal registration).

Different types of rights, restrictions and responsibilities, parties, spatial units, roles in processes, etc. can be integrated in this conceptual data model via code lists. A specialisation of the LADM is the Social Tenure Domain Model (STDM). In this specialisation so called 'social tenure relations' are used to identify the people to land relationships. STDM functions in a more informal, legitimate environment, in principle with known by the government as a system for recordation of land rights. A specialisation means that STDM is incorporated in LADM. In LADM/STDM a range of legal and/or legitimate land rights can be included as core of a land administration.

LADM defines land administration as the process of determining, recording and disseminating information about the 'relationship' between 'people' and 'land'. The land rights identified in the continuum are covered in this definition. It can be expected that other types of land rights exist at a national level. This means that the set of types of land rights must be extensible. 'People' in the definition are the different 'right holders' and 'land' concerns spatial units where a right applies. The LADM diagram is shown in Figure 2.

The LADM provides an abstract, conceptual model with four packages related to:

- parties – people and organisations – in green in Figure 2;
- basic administrative units, rights, responsibilities, and restrictions – in yellow;
- spatial units – this package is represented in blue, and;
- spatial sources (survey), and spatial representations (geometry and topology) – in red in Figure 2.

Those packages can be related to different organisational responsibilities. For example: the population and business registers manages the data on parties, the land registry manages the data on basic administrative units and rights and the cadastre on spatial units. Those formal responsibilities are integrated at a conceptual level in LADM.

Apart from those formal responsibilities related to formal data sets there may be another land administration (or land recordation) where data on non-registered parcels or spatial units are collected and maintained. It may be that such a land administration covers only a part of a territory and it may be that this other land administration is organised in a different way. For example: the administrative and spatial data are collected and maintained in an integrated organisational structure and/or approach. There may be more than one land administration of this type. If all land administrations use the same data standard – independent from the way of organisation and approaches – a data-integration is possible. This data integration is in support to the user of the land data.

LADM/STDM will be used as a framework for a strategy for implementation of the continuum of land rights. The LADM/STDM is a generic and global model – like the continuum of land rights. LADM/STDM can be applied everywhere. It can also be used at meta level to identify areas, responsibilities, different organisations or communities active in land administration.

3.2 Functionality of the LADM

The triple *party – right – spatial unit* constitutes the basic structure for land administration and (Lemmen, 2012). LADM ‘provides a terminology for land administration, based on various national and international systems. The terminology allows a shared description of different formal or informal practices and procedures in various jurisdictions’. Those ‘informal practises’ may concern customary and informal tenures, as can be recognised in the definitions of basic administrative unit, level and right in the standard.

The basic administrative unit (BAUnit) is defined as ‘administrative entity, subject to registration (by law), or recordation [by informal right, or customary right, or another social tenure relationship], consisting of zero or more spatial units against which (one or more) unique and homogeneous rights [e.g. ownership right or land use right], responsibilities or restrictions are associated to the whole entity, as included in a land administration system’.

A level is a set of spatial units with a geometric, topological or thematic coherence. A level example given in the standard is ‘one level of spatial units for an urban cadastre and another for spatial units for a rural cadastre’, another example given is ‘one level with point based spatial units, a second level with line based spatial units, and a third level with polygon based spatial units. Many more examples of the use of levels are possible, of which two are mentioned in the standard. This also demonstrates that the requirements concerning the plurality of spatial units are met (and the representation of spatial units).

Right is defined as an ‘action, activity or class of actions that a system participant may perform on or using an associated resource’. Rights can be in the domain of private or customary law. Different types of rights can be represented in code lists in the LADM. This will require classification and a classifier. A classification includes the development of a typology in land rights, tenure types and/or social tenure relations. Restrictions to rights also need classification. Rights may be overlapping, or may be in disagreement.

New land data and data updates to existing land data should be documented. Source documents may be completely digital and are always linked to parties with a role in the data collection or maintenance. This can be a trusted person in the community or a local land professional. Source documents are expected to be archived – it concerns authentic documents.

LADM concerns land and water and the administration of elements above and below the surface of the earth as utilities and mining. It is about the partition of the space in land rights – not about physical objects.

STDM has the classes Party, Right(s)-Restriction(s)-Responsibilit(y)(ies) (RRR, in STDM this is called social tenure relationship), spatial unit and source.

The names of persons responsible for the creation of data or for the transactions on land rights are part of the data set. Those names are linked to roles which can be of different role types: conveyors, (grassroots) surveyors, registrars, etc. The roles as identified in the RICS crowd sourcing report (RICS, 2011) may be included: for example trusted intermediaries and local land professionals. Or the roles as in (UN-Habitat/ITC/GLTN, 2012): land officers, record keeper, witness, etc. Those different recognised roles in data collection and maintenance can be included in a national code list.

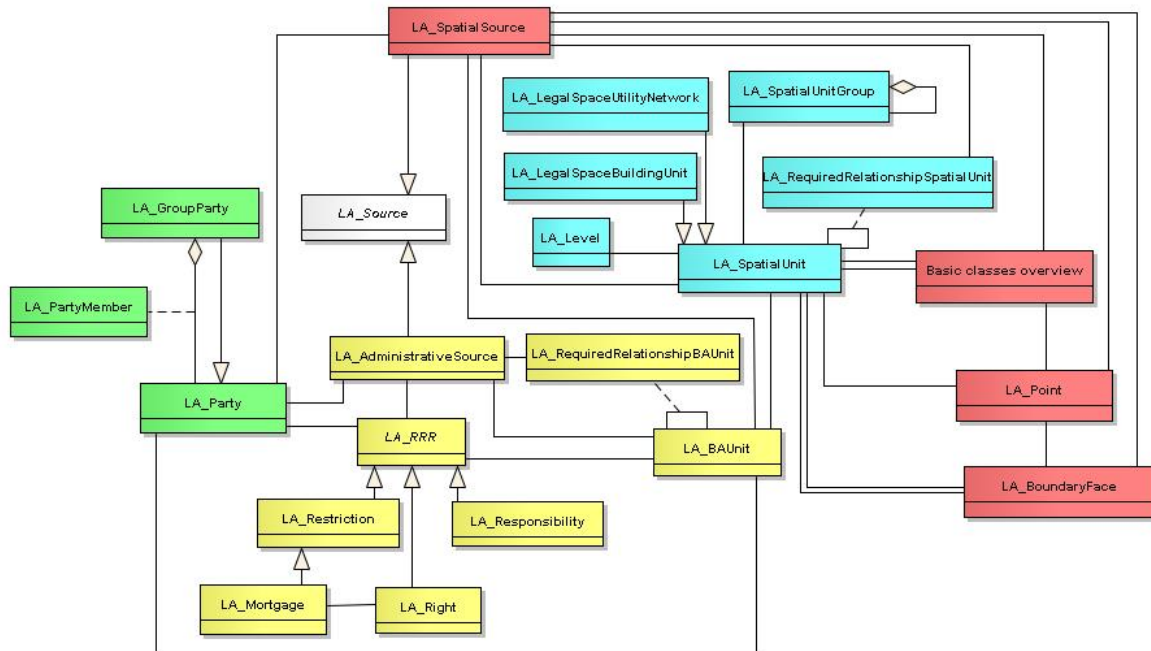


Figure 2 The Land Administration Domain Model - diagram (ISO 19152:2012)

3.3 Information and Communication Technology

The continuum of land rights approach is part of a global paradigm shift on land, and is gaining wide acceptance. Key documents as ‘Secure Land Rights for all’ (UN-Habitat, 2008), the ‘Land Governance Assessment Framework (LGAF)’ (World Bank, 2012), the ‘Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGTs)’ (FAO, 2012) and the ‘Framework and Guidelines on Land Policy in Africa’ (AUC, ECA and AfDB, 2010) provide strategies or guidelines contributing to the implementation of the continuum. Those strategies, guidelines and indicators are however not very specific with regard to the application and use of Information and Communication Technology (ICT). Adopting an ICT supported approach is considered to be of crucial importance for the operationalisation of the continuum of land rights. This is a strategic choice in the implementation of the continuum of land rights and the related land administration.

Publication and sharing of approaches, policies and strategies, tenure typologies and atlases, projects and project areas etc. on the web contributes to transparency and openness. Indicators are under development as basis for

measurement of achievements. Given the expected volumes of data it can be stated that this type of measurement performs best in an environment with support of ICT.

ICT includes the setup, development and use of services. It also implies a clear agreement on ownership of data and liabilities related to the use of data (e.g. liabilities related to damage because of non-optimal quality of data – unless such liability is not accepted by the owner of the data and this is published as such. . Appropriate and affordable data standards as the LADM/STDM are needed in combination with process models for transactions and data changes. Software developers need data- and process models as agreed specifications. Generic approaches are possible – always with the option for local adaption and adoption. ICT infrastructure may include the availability of communication networks for the use of mobile devices, data infrastructures, application infrastructure etc.

3.4 Distributed environment

Land administration data in many countries are collected, registered and maintained by different organisations. And within one organisation from many offices. Administrative territories for organisations can be overlapping.

Data collection requires recognition and classification and developing a typology of rights – the continuum implies at least de facto recognition of informal rights. Legal recognition will not be instant, and is often more likely to happen through administrative procedure (called ‘conversion’ later on) or ordinance rather than a land law. E.g. recognition via land use planning or other administrative mechanisms, creation of development areas, social compacts, moratoria on evictions etc. A recognition may be administrative or tacit recognition. Data collection may be initiatives involving organised residents, NGOs, etc.

Data collection requires project organisation, data acquisition based on participatory mapping, enumeration and surveying approaches, data inspection and publication. (UN-Habitat/GLTN, 2010) Maintenance processes support transactions in land rights and the establishment of rights, restrictions and responsibilities. It must be possible to use data in an environment of data infrastructures – where data are produced and recorded by different communities and/or organisations.

There are opportunities for greater cost effectiveness in areas such as subcontracting work to the private sector; increasing cost recovery through higher fees, sales of information, and taxes; and by linking the existing land administration records with a wider range of land information. This wider range of land information implies involvement of more organisations and communities. It can be observed that organisations are becoming more dependent on each other and are in fact forced to openness (of systems) and exchange (of data). Innovations as crowd sourcing will be more difficult to organise if the data collector needs to interact within such a distributed environment if no ICT infrastructure is available. For citizens it is easier to have just one interface with one portal/organisation combined with a citizen centric approach.

3.5 Information management ‘in the cloud’

A number of initiatives supporting of the continuum of land rights are emerging that are based on the concept of democratizing land rights through citizen empowerment and crowd sourcing, including Open Tenure in SOLA from UN-FAO, MapMyRights™ Foundation, the Rights and Resource Initiative, the Missing Maps Project and MappingforRights. These initiatives involve citizens and communities capturing their evidence of land rights on mobile devices and recording their evidence on a global platform that is accessible globally ‘in the cloud’. Cloud computing is making available hardware, software and data via the internet (based on requests). These are trust-based, rather than legal-based systems, and increase security of tenure through societal evidence and global publicity might become the norm for rights not yet recognized by national governments. These innovative initiatives are embracing scalable, Fit-For-Purpose approaches, and many are initially working with indigenous communities. They have the promise of accelerating global coverage, but it still needs to be resolved how ‘crowd sourced land rights can be formally recognised over time.

3.6 ICT Support

ICT support is assumed within the implementation of the continuum of land rights. This can be based on ‘cloud computing’ approaches with Land Administration Systems (LASs) based or based on OpenSource and/or commercial software solutions. It is important that the structure of data allows exchange between databases: STDM Supports recordation of land rights, and LADM supports registration. Conversions from recordations to registrations are supported in STDM/LADM environments – at a conceptual level. More and more real software is being developed based on this concept.

4. Categorisation

4.1 Introduction

The proposals in this document are based on the “conceptual sequence”: *Categorise, Collect, Convert*. Categorisation is a key issue for implementation of the continuum of land rights and is introduced in more detail in this section. Categorisation includes building a classification and development of a typology of land rights; it includes a level of co-ordination (social authorities and representations from multi-polar state – see Laarakker et al, 2014) at organisational level and establishment of a national tenure overview or typology at technical level.

Multiple levels of classifications have to be built, this requires more than coordination. E.g. in a country the constitution could recognize customary rights. Based on the derived civil code and related cadastre law only freehold is accepted for registration. A social authority has its own classes of customary rights.

4.2 Recognition

Categorisation through the continuum of land rights implies recognition. This is only possible if the land rights are not conflicting – where it has to be noticed that conflicting rights may be mapped for overview and resolution purposes. The occurring de facto and de jure land rights are deemed appropriate and legitimate; their authority is confirmed by the State or a recognized social entity or ‘social authority’ – this is one of the features of the continuum.

Successful operationalisation of the continuum is, at the end of the day, only possible at country level to the extent that governments are prepared to accommodate a diversity of land tenure forms within the land administration system. At country level formal and legal as well as legitimate and customary or informal land rights can be managed in one single environment - this environment can be a separate State in a Federal System.

It is possible that a tenure system is related to more than one country. Implementation of the continuum at country level means that such a tenure system is linked to more than one country of implementation. It implies a territorial subdivision of the tenure system from the perspective of recognition of the tenure system. It means that national boundaries need to be known.

4.3 Publication of right types

There are various forms within the tenure continuum that can provide adequate security for all land users. Implementation of the continuum approach would require a detailed typology (a complete categorisation) of these forms of tenures. This requires the availability of a complete overview of the tenure systems and land rights related to the areas where those systems and rights apply. All formal and non-formal tenure categories and sub-categories should be identified and related to space. Land use planning or other planning processes may result in restrictions or responsibilities related to certain areas. This requires publications of zones with restrictions (or responsibilities).

Within one country, areas with recognised tenures may overlap (i.e. conflicting); this is also valid for state owned land. For one location more than one tenure system may be applicable (i.e. conflicting). This type of

overlap means the existence of a dispute or conflict. The area of dispute or conflict can be published as such. Apart from the representation of categories of tenure systems and land rights at macro there may be reasons for representation of overlapping claims and related disputes/conflicts at micro level. This may concern different rights over the same asset, also possibility of seasonal rights (i.e. cyclical, over time), or rights of specific resources on same land, etc. Also areas under dispute resolution can be categorised as being excluded from transactions or other changes in the people to land relationships: a typology of land conflicts/disputes.

4.4 Classifier

The process of categorisation of land rights includes classification and development of a typology of tenure systems and land rights by a recognised authority. It can be a mandated authority or a co management with a social authority. It must be a trusted authority. In all cases identification is needed, each tenure and land right needs to be classified.

The result of classification is a coded system and a brief description of tenure types and rights types related to the areas where those types apply. The descriptive component may include conditions related to gender, equity. Further, there may be restrictions related to land markets, investments, natural resources (mining) for certain tenure types. Apart from tenure and land right types also restriction types and responsibility types need to be classified. This requires again a classifier.

4.5 Party types (right holders)

A tenure system may be applicable for a group of persons or for a group of groups of persons. Membership can be defined or not. For example: foreigners can be under a different regime when it is about relations to land rights. Or persons who are not a member of a community can be under a different regime where land rights are concerned – e.g. cannot acquire land rights within the territory where communal lands are recognised. Classifications or typologies are also needed for types of persons, parties or right holders, see Figure 3. There can be many types of parties – there is something like a continuum of rightholders ranging from more individual to more social types of parties (groups). Parties can be persons, or groups of persons, or non-natural persons, that compose an identifiable single entity. It should be noticed that a party can hold a share in a right, e.g. in case of marriage, or groups of persons holding rights.

Women’s access to land can be organised by registration or recordation of shares in rights. Women shares in land rights or land use rights should always be recorded registered in land administration. A non-natural person may be a tribe, a family, a village, a company, a municipality, the state, a farmer’s community/cooperative, a slum dwellers group/organisation, a religious community, and so on. This list may be extended, and it can be adapted to local situations, based on community needs.

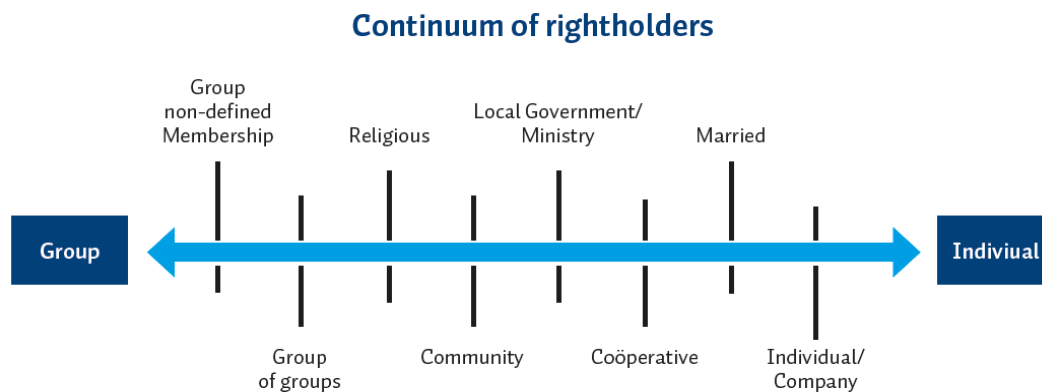


Figure 3 Continuum of rightholders

Figure 5 Example of Representation of spatial units (Source: Missing Maps)

5. Data Collection

5.1 Introduction

The proposals in this document are based on the concept: *Categorise, Collect, Convert*. Collection is a key issue for implementation of the continuum of land rights and is introduced in more detail in this section. Collection of data means providing authorisation at institutional level (in order to set purposes), recordation (STDM/LADM) at organisational level and monitoring at technical level (keeping overview).

5.2 Participatory Approaches

Imagery is a powerful tool in participatory approaches. People, living in informal area's in developing countries, which are visited by someone with an enlarged satellite image or aerial photo in his or her hands will invariably give attention to this image or photo. The visitor will be surrounded by many people almost immediately. People really understand what they see on the image and can contribute to updating, elaborating and correcting it. They can identify the place and area where they live, and where their neighbours live, and what the applicable social and tenure relations are. If they trust a process, and have a measure of control over it, the quality and usability of information can be significantly increased. Various effective, innovative approaches of data collection, representation and validation have been developed and are in use in many parts of the world by GLTN partners and others. (UN-Habitat/GLTN 2010; FIG, 2010).

5.3 Social Tenure Domain Model

The Social Tenure Domain Model can be used for storage and maintenance of collected data. STDM can manage the links between a range of right holders and a range of spatial unit types. The STDM is a specialisation of LADM. See Figure 6 for an overview of the STDM.

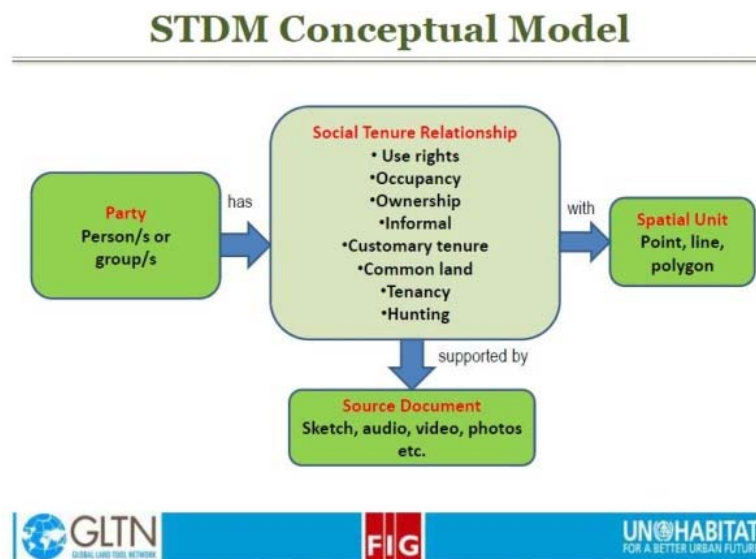


Figure 6 The Social Tenure Domain Model (Source: UN-Habitat)

The STDM contains attributes on parties, social tenure relationships and spatial units. See Figure 7. Spatial units may be represented as points, lines, and polygons – See Figure 4. This flexibility is most optimal in support to the implementation of the continuum of land rights approach. In Figure 7 the range of land rights as in the continuum is represented by the vertical line in the middle. The range of parties by the vertical line at the left

and the continuum of spatial units by the vertical line at the right. See Figure 7. The real options are available after the classification process (resulting in a typology).

One (or more) of the different types of parties can be associated to different types of land rights. The associated parties/land rights can be related to spatial units which can be represented a points, lines, polygons etc. The lines (boundaries) may have a specific accuracy.

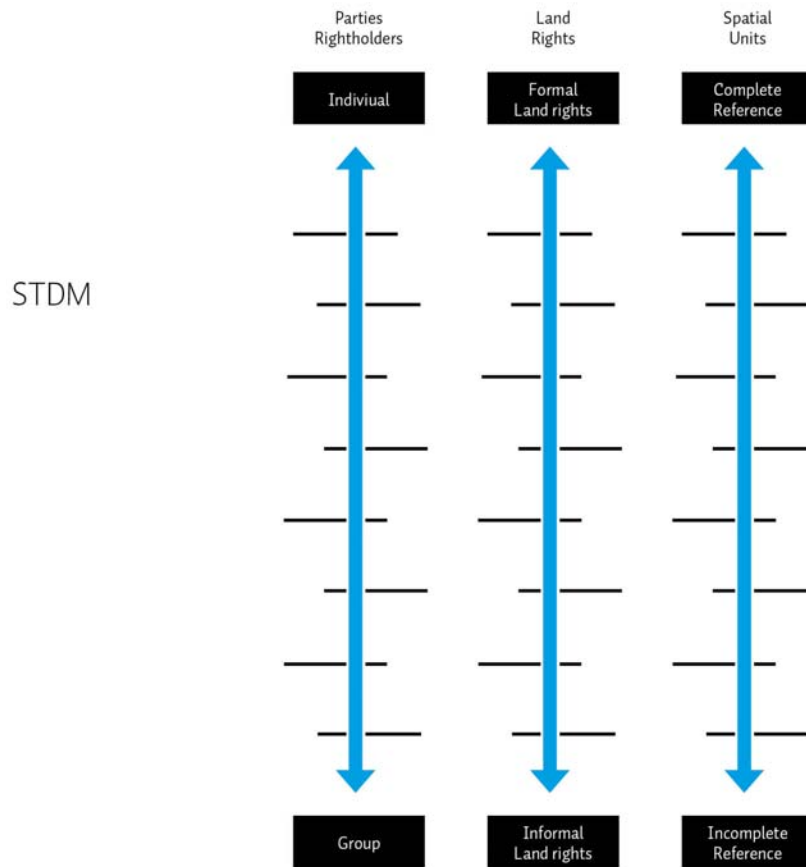


Figure 7 The STDM in relation to the continuum approach

5.4 Data Acquisition

Surveys may concern the identification of boundaries of spatial units on a photograph, an image, or a topographic map. Surveys can be conventional land surveys, based on hand-held GPS. In all cases the representation of 'legal' reality should be distinguished from the 'physical' reality.

There may be sketch maps drawn up locally. Depending on the local situation, different registrations or recordings of land rights are possible. In rural areas there can be spatial units covering customary areas. Those spatial units can be recorded as 'text based' spatial units, where boundaries are described in words. Or as 'line based' spatial units, drawn on low accurate satellite images. Depending on context, a settlement, community or tribe may be represented by its (legitimate) leadership or chief. Formal property based spatial units can concern formally registered ownership with a related owner and with identified boundaries by accurate field surveys.

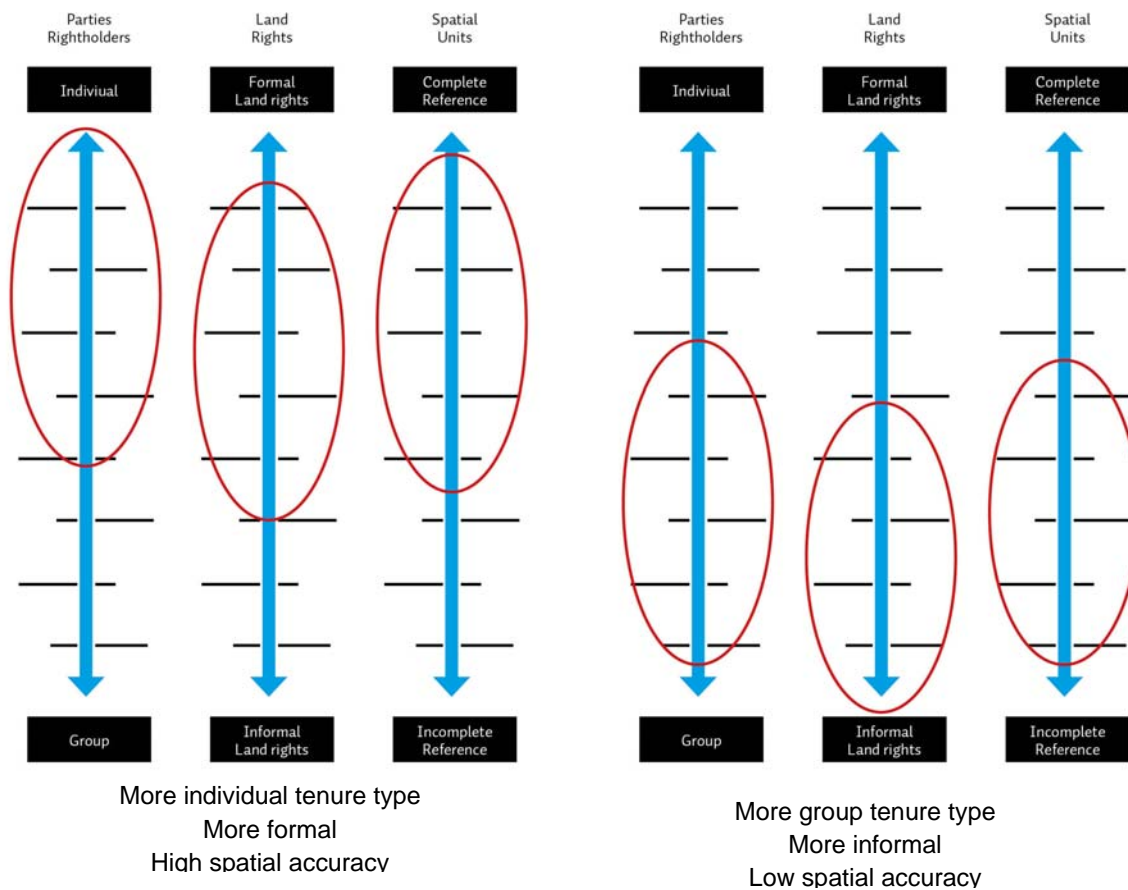


Figure 8 Different qualities for spatial units

Different accuracy options are available – depending on the available resources (including time), see Figure 8. Improvements are possible: a boundary can be surveyed later in time with a higher accuracy – this is represented in Figure 9 by the ellipse which is in the ‘lower accuracy range’ at the left and in a higher accuracy range at the right.

5.5 Visual boundaries

The spatial component of a land administration concerns the identification of spatial units (where land rights apply with related right holders) in the field.

Visual boundaries can be easily identified on high-resolution imagery in the field using participatory mapping approaches. In some countries, members of local communities have been successfully trained to become ‘grassroots surveyors’ in a few weeks. The required human resources for collecting evidence from the field can be effectively organised in this way and scaled up. Based on briefings with neighbours and community members, the boundaries can be drawn with pen on top of an image.

Administrative data, such as names and personal IDs can be linked on site during this process using preliminary reference identifiers for the spatial units. If boundaries are not visible in the field or not visible on the image, some simple field surveys may be needed for data completion. It is always important to remember that the local community can check and agree on the data – if possible the same day. The community ‘sits around the map’, a social process, where people determine their own rights in land – guided by a grassroots surveyor and/or land professional.

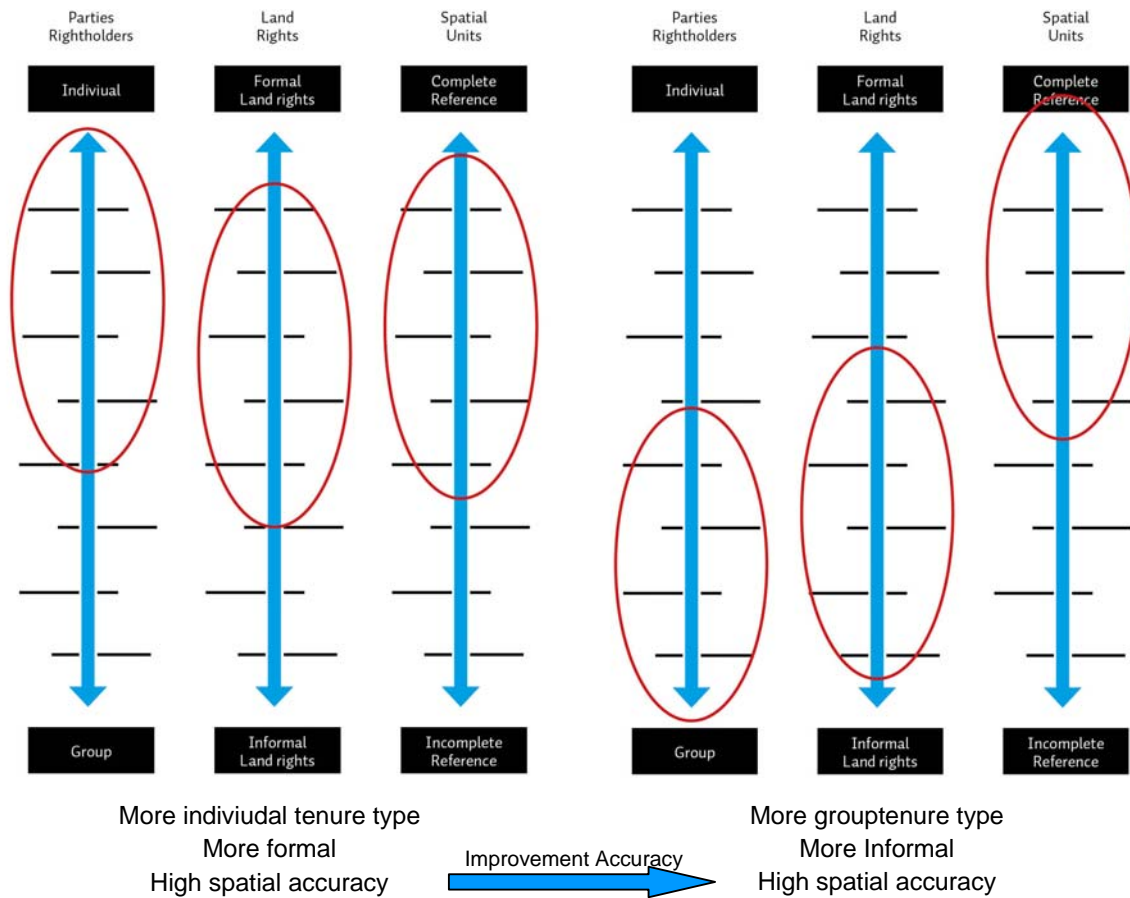


Figure 9 different qualities for different units – quality improvement later in time

5.6 Scalability

There are alternative data acquisition approaches that can be adopted within the context of purpose, budgets and availability of human resources. This ranges from accurate measurements supported by Continuously Operating Reference Stations, through total stations, handheld GPS, plane table, tape, chain and rope. See Figure 10. Unmanned Aerial Vehicles (UAVs) are emerging as a promising alternative in cases where only high accurate data are accepted. Imagery data sources such as GoogleMaps or Microsoft VirtualEarth can be used, and the inclusion of high-resolution data at those sites may be agreed. Administrative data collection can be paper based or digital. Quality labels are crucial for later improvements.

Monumentation in the field should be avoided – unless people organise this themselves. Placing beacons is expensive, time consuming, and not efficient for achieving land administration with complete coverage. High resolution imagery is normally sufficient resolution to resolve conflicts about landholdings. The approach is not new and has been successfully used in several countries during the last few decades, for example Cambodia, Ethiopia, Kenya and Rwanda (FIG, 2014). The new aspect is that it is now scalable and can be applied in a massive way including management of big volumes of data. In the near future applications using mobile phones can be expected.

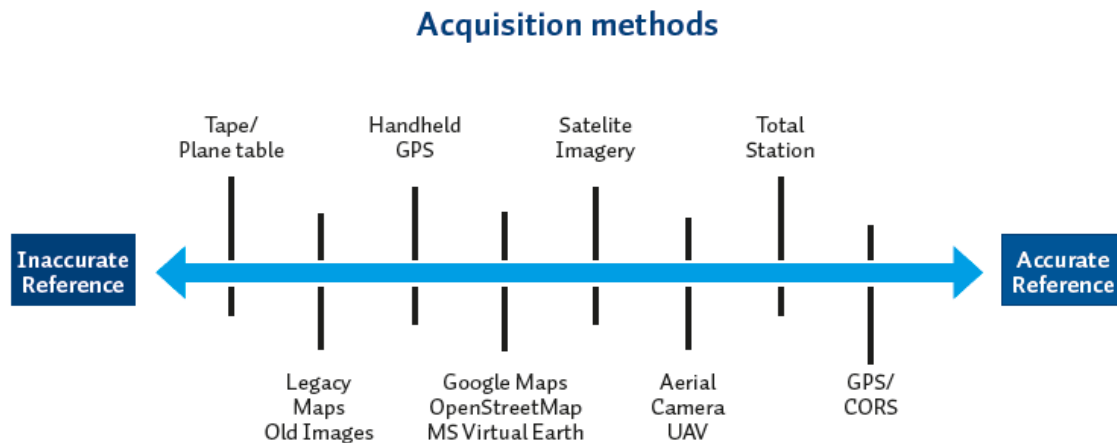


Figure 10 Continuum in data acquisition methods

5.7 Capacity

Capacity development is crucial. Simple, easy to learn, data acquisition methods are needed. This must be coordinated and supported by professionals capable in capacity development and innovative, participatory methodologies – e.g. surveyors, legal experts and other land professionals.

Worldwide only 350.000 surveyors are available. Those high level professionals should not perform the data acquisition themselves. Instead they should provide and share their knowledge. A key activity for surveyors is in geo referencing data from different sources and in national object identification. The huge task of data collection requires management of resources, logistics, education of local trusted persons, etc.

In many cases the land professionals themselves may need post graduate education in order to be prepared for new and challenging, citizen centric, approaches.

5.8 Automatic feature extraction

Automatic feature extraction from ortho-imagery to support topographic mapping is now mature and can be used to assist the spatial data collection for land administration purposes.

This assumes a cloud free satellite imagery composition. Images from fieldwork can be scanned and then compared with the result of automatic feature extraction from the imagery in a GIS environment. First a pass generalisation can be completed to obtain a set of vectors, which reasonably represents the visual boundary. Some interpretation and editing will be required as there may be topographic features inside a spatial unit of a right-holder. In the case of invisible boundaries on the imagery, some extra field observations may be needed.

As a next step, the vectors obtained as a result of feature extraction can be re-used in the spatial unit layer for land administration. Then the polygons can be closed and corresponding spatial units will then be automatically referenced to their final identifier. Administrative data collected by paper can be linked based on the preliminary identifier. See Figure 11.

Proper geo-referencing and automatic feature extraction can be done later through post processing, once resources and capacity/expertise is available. From an information management perspective, this requires versioning and management of historical data. The scanned imagery from the field has to be archived as source data. In case automatic feature extraction is not available then digitisation on top of the scanned images with boundaries drawn in the field can be executed.

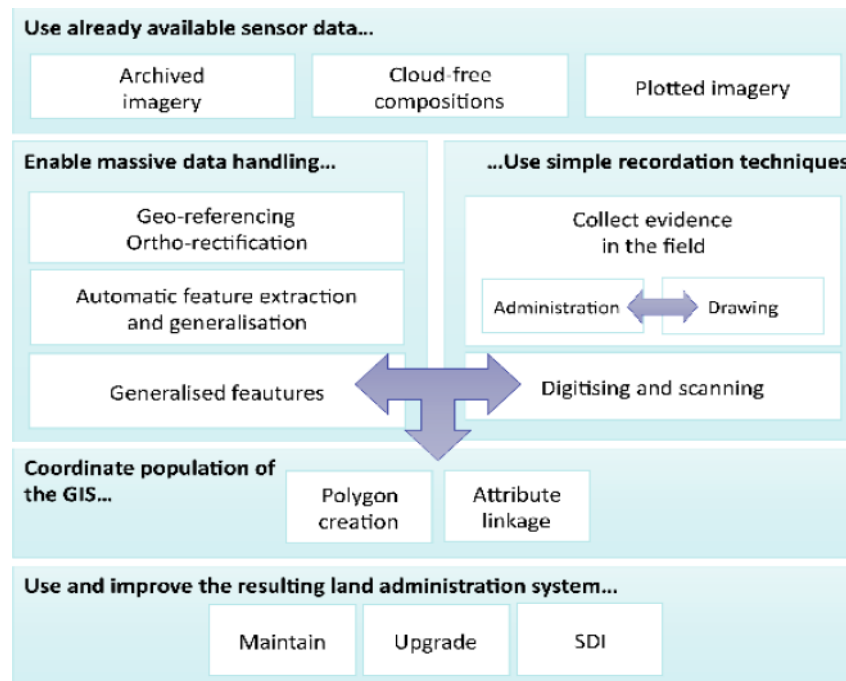


Figure 11 Scalable data collection approach

Version management is needed in any case because quality improvement of geometric data is an important second step. This upgrade can be organised in a sporadic approach during data maintenance, based on accurate field surveys, with GPS, for example. As soon as a set of new co-ordinates is available in an area then existing data can be transformed. Systematic quality improvements can be related to land consolidation and implementation of urban plans.

5.9 Sources of Software

GIS functionality is available to support all the data acquisition and data handling processes. Functionality for data collection in land administration is, for example, the Social Tenure Domain Model (STDM) provided as open source software by GLTN or FLOSS SOLA with support of FAO (FLOS means 'Free and Libre Open Source Software' and SOLA is a project for 'Solutions for Open Land Administration'). STDM compliant software is also available from industrial software providers. Functionality for surveying and feature extraction is available from many software providers.

Note: the ISO 19152 does not include yet compliancy specification as for LADM in Annex A of the International Standard.

5.10 Maintenance

Inclusion of new data and data updates should be documented. This documentation may concern legal/administrative data, spatial data and technical data. Updating of data in one organisation may need updating in another organisation. Organisations may be accessed 'in the cloud'.

5.11 Organisational

It is very important to see the organisational impact of the post processing option: data acquisition can start and can be organised independent from the data handling for feature extraction. Geodetic expertise, software

licenses, hardware, etc is needed for post processing and GIS activities. This may be supported by donors and can be organised on availability.

A set of instructions for data collectors is required. Data collectors should be known.

In a radical democratic approach the data collection may be done by the citizens themselves. Identification and approval mechanisms may be required and may be available from apps installed on mobile phones. In all cases land rights have to be recognised by the State.

6. Legal and technical Conversion

6.1 Introduction

The proposals in this document are based on the concept: *Categorise, Collect, Convert*. Conversion is a key concept for implementation of the continuum of land rights and is introduced in more detail in this section. Conversion means recognition at institutional level. It is the step from recordation to formal registration of land rights. This includes conflict resolution and also options for formalisation and maintenance at organisational level and information-infrastructure at technical level.

The features of the continuum include options for conversion from one type of tenure to another type of legitimate tenure. This may involve a legal or administrative conversion from one tenure type to another. Or it can be a technical conversion as a quality improvement for spatial data in a Fit-For-Purpose approach. Conversions are possible between types of parties (right holders). There can be a legal conversion from one tenure and/or right type to another. And there can be a technical conversion – e.g. from paper to digital environment¹.

6.2 People to land relationships

People access land in many ways; for long and short periods. People possess land in different ways, including though simply occupation due to basic needs – everybody needs a piece of land to sleep, live and walk. Possession of land can be with or without societal approval. Land tenure forms emerge according to scarcity of land. People start to have opinion on others' relation to land. Rules of 'management' and 'access' develop, as do disputes and conflicts. Land tenure is a person-to-person-to-land relationship

6.3 Legitimate land tenure

The VGGTs and the continuum (and its features) recognise legitimate land tenure holders and their rights. This is illustrated by Zevenbergen (see Table 1).

Table 1 Combinations Legal/Extra Legal with Legitimate/Non-Legitimate Land Rights (Zevenbergen)

Land Rights	Legitimate	Non-legitimate
Legal	Law followed in letter and spirit; usually formally documented	Law followed in letter but not in spirit; titles gotten via unethical processes
Extra-legal	Societal and/or historical accepted access to land; no formal documents	Criminal land access

¹ Note: parts this subsection include inputs derived from a presentation on this subject given by Prof Dr Jaap Zevenbergen in Dhaka, Bangladesh. Presentation titles 'Conversion of Legacy Data (Introducing good international practices and standards' presented at the Training Workshop 'Modern Land Administration System and Legal Issues for Land Management', held 29 - 30 November 2014 in the CIRDA Conference Centre, Chameli House, 17, Topkhana Road, Dhaka.

Table 1 illustrates four ‘combinations’:

- **Legal/Legitimate:** In this case existing laws or documents (or legal cases without documents) are the basis for ‘conversion’. The legal conversion includes a verification against the laws and regulations that existed when the right and document came into being. There may be a need for a ‘transitional’ law to make the rights fit a/o adapt to new land policy and legislation. There can also be a technical conversion - e.g. linking boundary data, conversion to digital environment, etc. Boundaries might have ‘moved’ a bit – in reality and/or on the representation of reality: the map. Norms should not be too strict when it is about areas.
- **Legal/Non-Legitimate:** Those ‘rights’ are based on tainted origin or a ‘poisonous root’; and are likely not to be established purely legal. If evidence of unethical processes can be given, the right and title should be ‘revoked’. If sold to others who did not know, it becomes tricky; two ‘legitimate’ claims are competing;
- **Extra-Legal/Legitimate:** Those land rights need to be recognised according to e.g. the continuum of land rights or VGGTs. Where this applies the rights need to be identified and (officially) documented. Two approaches are possible: areas where all land rights are recognised and registered or areas where a prescription term starts with a recordation of existing rights and a conversion to formal rights later in time. Multiple sources of evidence should be allowed – verbal (by local leadership, neighbours – can be recorded), documents linked to utilities/taxes, (aerial) photos proof presence. There may exist (informal) participatory maps. Adverse possession / prescription rules apply – legal mechanisms are needed and must be published in advance; and:
- **Extra-Legal/Non-Legitimate:** This is a consequence of criminal activities and should not be recognized. Enforcement should be applied; if not for longer time than it becomes ‘legitimate’. Example: a mafia group protects a group of people illegally occupying a piece of land which is under held by someone else. After the prescription period the land right is claimed (by the mafia).

From those options possible conversions can be derived: from Legal/Non-Legitimate to Legal/Legitimate. Or: land rights obtained as a result from unethical or criminal activities are reversed back. In some types of title systems this may not be possible.

6.4 Land Tenure

Feature no 6 in subsection 2.2 of this paper states that the continuum of land rights provides the possibility of movement from one form to the other, in either direction, along the continuum, depending on changing circumstance and/or need. At country level conversions from one tenure type to another may or may not be possible – depending on the conditions and limitations related to the particular land tenure type and circumstances. Land transactions may be allowed or not. Again a typology or classification is needed. Restrictions to land rights may be established as a result from e.g. spatial planning. The wide range of functionality of the LADM is in support to the operational use of the continuum of land rights – that is the management of different tenures in one environment. The operationalisation is based on this functionality as an integrator in order to get data on land rights available in a single environment.

This includes recognition of a continuum of land rights, with it a continuum of approaches, a continuum in recordation, and the continuum of spatial units and subjects (parties). The recognition, support and protection of land rights (meaning tenure security and certainty) for all is the focus of the operational use approach. This implies the inclusion of a land-administration policy development, organisational development, system design and development. Those land administration systems can operate in formal and informal environment (‘self-made land administration’). Conversion of existing land rights and quality upgrading of existing datasets is a crucial issue. The conversion of existing legacy data sets may be related to challenges. The management of a wide range of documentation is possible: this concerns evidence from the field and legal, transactional, and

administrative documents. Attention needs to be given to recognition and strengthening of informal (i.e. unregistered) land rights and other (unconventional) transactions between different tenures and parties, e.g. transactions to secure women’s and minorities land rights. The occurrence of ‘land grabbing’ and opposition to bona fide and beneficial large scale land acquisitions could be avoided if a proper documentation and protection of the existing situation concerning land and land use rights is available. Visualisation of user requirements for land administration as a basis for monitoring progress in land administration development will get some attention.

6.5 Land recordation

STDM Supports recordation of land rights, and LADM supports registration. Land recordation is based on a first initial data collection by a recognised data collector – which can only be a trusted party. Maintenance of the data can be organised within a community or urban area. Conversion of this category of data to data in support to recognised legal, registered and formal land rights is possible at any moment in time – based on the legal options as described above. For conversion it is relevant that the data structure of a recordation and a registration is the same. STDM and LADM are in support to the recordation and recordation of all types of land rights. The standardisation aspects are on the data structure. A common data structure allows easy and efficient implementation and data exchange between recordations and registrations. Overlaps in tenures are allowed if it fits to the requirements for a recordation or registration. Overlapping rights are allowed and can be provided for decision making.

Figure 12 provides an overview of the continuum in recordation options from simple to more complex. The presented options are also valid for registrations. AS typology of recordation and registration systems is needed in order to organise a conversions. LADM offers the inclusion of such a typology. One specific type of recordation or registration is the destroyed system – because of war/disaster, etc. In such a situation many citizens may have copies from registered documents.

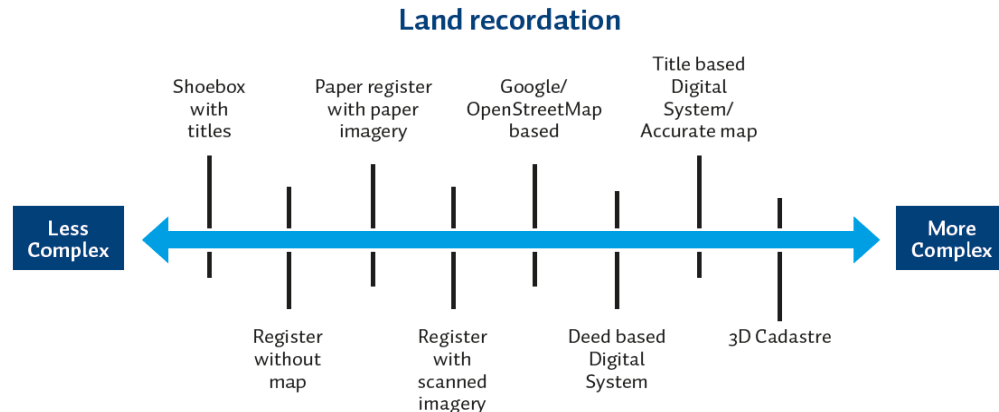


Figure 12 Continuum of recordation

7. Implementation strategy

7.1 Introduction

GLTN is involved in ongoing global advocacy work to promote the continuum of land rights as a viable approach for tackling the pressing land challenges facing many countries around the world. It is important to recognise that for a government to get to the stage where they are about to implement the continuum often requires a prior political process. This is important not only to ensure that the political will and resources required for implementation are committed, but also that the particularities of the national and local legal framework, social context/s and culture/s are recognised and incorporated into the approach. The

implementation strategy given below applies to those growing number of cases where the need for the approach is recognised and, in some form at least, about to be / in the process of being implemented.

7.2 Goal

The implementation of the continuum of land rights at country level can be formulated as follows: ‘recognizing, recording, administering a variety of appropriate and legitimate land tenure forms’.

Recognising a variety of appropriate and legitimate land tenure forms should be based on an overview of the existing de facto and de jure land rights. Codification can be done by state authorities and social authorities. Co-ordination needs to be organised; it should be clear and communicated which authority is responsible for this task in which area. Overlaps in tenures may be possible, the boundaries of areas related to authorities may be fuzzy – for this reason a national tenure overview needs to be established.

Recording a variety of appropriate and legitimate land tenure forms implies collecting overview of all the existing land rights. A plurality of units of measurement is being used. Some rights may be extra-legal and/or not legitimate – but need to be recorded for decision making in relation or recognition.

Administering requires a mandate to a State or social authority resulting in final recognition and publication of all those land rights in one single environment. This may include registration. In short:

1. Categorise Land Rights; this is based on a recognition of the continuum of land rights
2. Collect overview of the existing people land relationships in the country
3. Convert from one tenure type to another where needed in order to improve security of tenure

7.3 Actor

GLTN (network) community, consisting of 66 key international land actors and their networks, and linked to donor-partners. GLTN partners include the FIG, the World Bank, LPI and FAO. (For a full list see <http://www.glt.net/index.php/the-network/glt-partners>).

7.4 Means

Implementation of the continuum approach by means of better recordation of land rights, (social) tenures and resources in integrated information systems. This must be related to recognition by government that this land information is collected.

The legal value of this information has to be recognised in order to include this information in a balanced way conflict resolution. This requires legislation on the legal value of this information (ex-ante or ex-post) and improved conflict resolution systems.

7.5 Equaliser

The term ‘continuum’ applies to land rights, but also to other key dimensions relevant in fit-for-purpose land administration (Enemark et al, 2014).

Great variations in methods and results are possible, depending on the particular implementation context – there is a ‘continuum in continuums’ with a continuum of parties, of spatial units, of data acquisition methods/technologies (with a related continuum of geometric accuracy), of recordation/contents/quality, of information management/organisation and a continuum in purposes of land administration.

Also in purpose of a Land Administration there can be different options, see Figure 13 here below with some examples. See also Saers (2015).

Functionalities and purpose

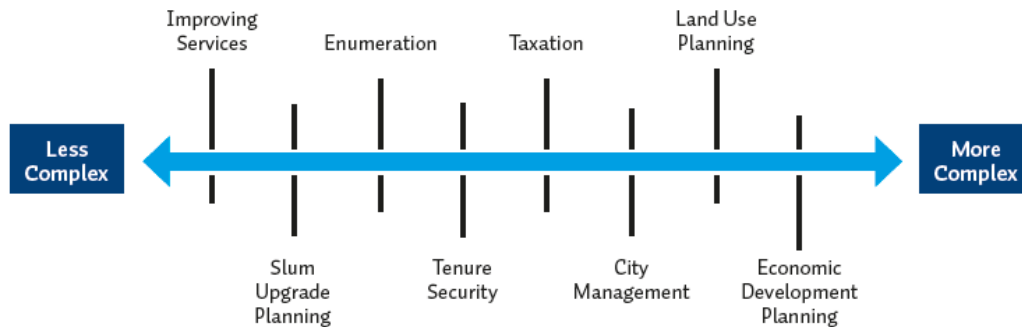


Figure 13 Purpose

The equaliser concept can be used to set a goal for strengthening land administration services, and then each of the nodes on the slider is a range that can be achieved depending on a factor, such as cost, or time, or quality, or all three.

Different sets of equalisers may also be used to address different goals in a jurisdiction, for example a land administration policy that is striving to improve social stability through tenure security, could involve large rural areas and low cost alternatives. This may be assessed differently on an equaliser to a land administration policy that aims to improve the economic stability by increasing land market development, thus focusing on urban market development and foreign direct investment requiring higher accuracy cadastral surveying and a computerised registration system.

The equaliser is a useful tool as can be adapted to highlight the different options to suit different needs, and is not only presenting expensive, unobtainable options often seen as 'best practice'. This concept can be carefully arranged to also show the assessment based on quality, benefit or value trade-offs in the instrument or service it delivers.

The equaliser is a useful tool as can be adapted to highlight the different options to suit different needs, and is not only presenting expensive, unobtainable options often seen as 'best practice'.

This concept can be carefully arranged to also show the assessment based on quality, benefit or value trade-offs in the instrument or service it delivers. See Figure 14.

For example:

- An administration for customary tenure (in order to protect against 'external threats' as land grabbing): group person type, customary right type, spatial unit type with fuzzy boundaries
- An point cadastre in a slum area in order to improve services: natural person type, informal right type, point spatial unit type
- A conventional parcel based land administration in a residential area (taxation, tenure security): (non-) natural person type, ownership right type, parcels type
- 3D Cadastre in business area: (non-) natural person type, ownership holding, volume spatial unit type
- State lands: government person type, state land right type, set of lines spatial unit type

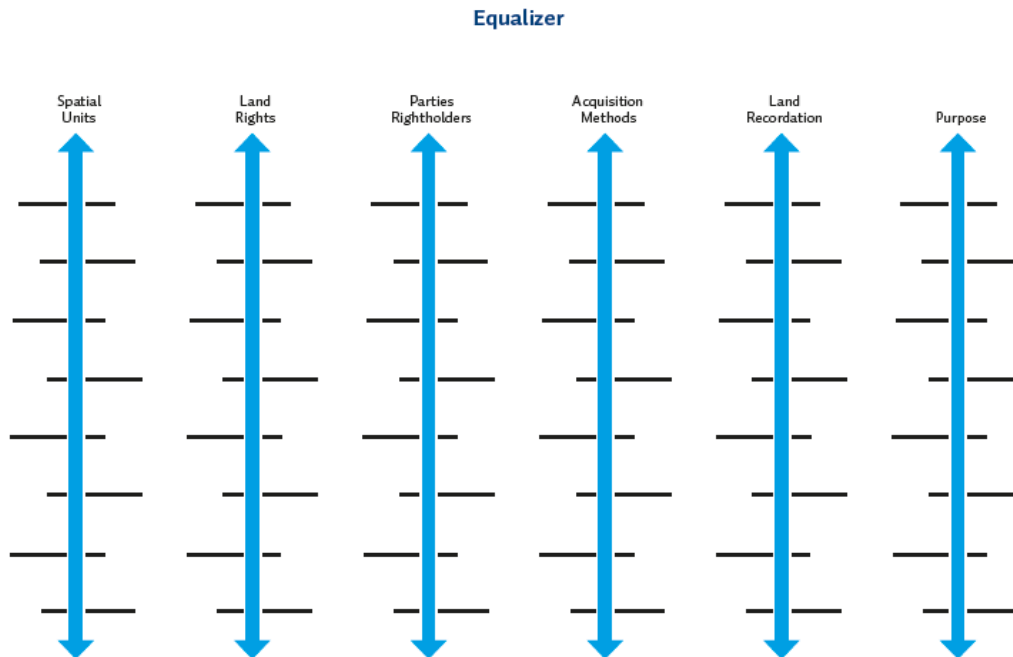


Figure 14 Equaliser

7.6 Digital National Tenure Atlas

Implementation of the continuum approach means the linking between a complete tenure system and the area where it applies – at a national level through categorisation, development of a typology and representation of this in an Atlas. To organise this process of linking and to share the results in a transparent way the availability of modern technologies is assumed.

This Atlas includes:

- the national boundaries
- the boundaries of tenure systems
- the boundaries of areas for data collection (monitoring)

There can be labels on the status of formalisation. Publication concerns a map with the representation of spatial units with linked rights and right holders

7.7 Recognition of tenure types

The process of recognition of tenure types within the continuum of land rights can be institutionalised at central state level or can it can be legally delegated or mandated to a de-central level. Overview at country level can be created by means of classifying existing tenure and land rights. A classifier is required and needs to be organised on a legal basis. This may be social or state authorities; or it may be a combination of state and/or social authorities. The classifier needs to describe the tenure systems and to check if all requirements are met, including ensuring that concerns such as gender and marginalised groups and the poor are accommodated.

The boundaries of a territory of a tenure system can be labelled as fuzzy, visual or fixed. Those boundary labels should be included in the National Tenure Atlas. Other representations of spatial units where tenure systems or land rights apply are possible. Availability of a spatial framework is a condition for the implementation of the

continuum approach. Categorisation **implies** building a classification or typology of tenure systems and land right linked to areas where they apply. A classifier is needed. The result is coded tenure types and land rights presented in a National Tenure Atlas.

7.8 General GLTN –

This subsection presents, for discussion, highlights of a draft strategy that GLTN partners are currently developing:

1. Develop guidelines for tenure security assessments, categorisation and/or typology formulation in accordance with the continuum approach.
2. Develop a specification for the proposed *National Tenure Atlas*.
3. Make an inventory of global spatial data providers offering services and tools to include voluntary collected data – e.g. Google Earth, Microsoft Virtual Earth, Open Street Map, MapMyRights, Missing Maps, Open Tenure in FLOSSOLA, CommunityLandRights, Mapping for Rights, Forest People Programme, ESRI solutions, etc. This also includes Land Matrix, Land Portal, FIG (OICRF, Cadastral Template).
4. Organise a global conference for interested infrastructure and services providers to discuss the draft strategy.
5. Organise a conference for providers of tools, devices and instruments (open and closed software's, apps, mobile phones, GPS devices, etc.) for development of tools, devices and instruments in support to data collection (finger prints or signatures and photos related to location). This could be prepared, organised as a separate event or combined with a World Bank, GLTN or FIG event.
6. Build on existing work around performance measurement (indicators) and contents of databases for land administration
7. Pilot methodology outlined in this paper in a number of countries.
8. Develop guidelines and policies for data infrastructure and for ICT infrastructure that would be needed to get transparent access to the data. This means that data from different sources (recordations, registrations and meta data in the national tenure atlas) can be combined.

7.9 Country level

This subsection presents, for discussion, highlights of a draft strategy that GLTN partners are currently developing:

Categorise – Country Level

1. Build broad support for all relevant levels of government including ministries and social authorities for the continuum approach and its incremental implementation.
2. Create and agreed tenure classification and typology, and appoint a classifier.
3. Develop a basis for an approach of recognition of previously unrecognised land tenure types and land rights. Check gender issues. Include water rights. forest rights, etc.
4. Publish the land tenure and land rights classification, typology and codes and related tenure descriptions and areas of application in transparent way in a National Tenure Atlas. Include the International ISO Country Code in order to make the code unique. This atlas should be established (geo-) infrastructure as soon as resources are available. Publish a conflict classification, types of parties, spatial units, etc. Areas where little no land market applies are also to be included in the atlas.
5. Develop a flexible spatial framework with options for local reference and inclusion of global reference in post processing.
6. Develop object, subject and document identifiers for easy implementation at local level. Identifiers act as links between all records related to it.

7. Identify new roles of professionals and other relevant actors (para-surveyors etc.) from measurement to modelling to management.
8. Look for link with global providers of data – Land Matrix, UN Overview of boundary data, SDGs, etc.

Collect – Country Level

1. Make a decision on the application of ICT (databases, GIS, networks, security).
2. Appoint an authority with a mandate to (actively) mobilise and certify land data collectors.
3. Offer (an option for) certification for trusted parties and goal keepers. Data collectors should be aware of requirements for legal and technical conversion.
4. Create awareness on the tenure issue amongst all organisations involved in mapping activities (mapping communities in slums, for health care, disaster prevention and other purposes). Undertake a pilot on non-conventional mapping methods and make them inter-operational with the official national mapping systems, see also UN-GGIM (2014).
5. Set minimal requirements for data to be collected in land recordation – Social Tenure Domain Model (STDM) based and for linkage to national level data systems.
6. Offer capacity development in application of STDM and associated tools such as participatory enumeration.
7. Publish authorised data collectors in a transparent way (including both legal and legitimate) – by the classifier (in cooperation and coordination with (social) authorities).
8. Publish code tables including quality labels, forms/templates for data acquisition (by the classifier in cooperation and coordination with authorities)
9. Develop a monitoring tool for land administration projects which includes overview of projects (including project areas for data collection and data conversions, overview of authorised data collectors, type of recordation, type of registration, type of data collection (including spatial unit types and related quality labels).
10. Use the National Tenure Atlas to identify areas for data collection. Approaches may be different – data are the same. Different approaches mean different labelling.
11. Obtain cloud free imagery. A donor country or organisation may be supportive.
12. Organise data collection per area/project in clear steps to include: an overview of the volumes of parties and spatial units; a recommendation for data acquisition approaches (FFP) and budgets and reality; and the process of the real data collection. Incorporate lessons from the piloting work done by the Global Land Indicators Initiative – GLII (GLTN, 2014).
13. Make a complete recordation of land rights with Fit-For-Purpose (FFP) approaches. This is the basis for recognition. Geo referencing and also conversion of administrative data can be organised in post processing. Include mapping of conflicting tenures and rights.
14. Prioritise access to justice for all affected parties, including an effective dispute resolution system.. This means that all land rights should be classified, mapped, published and accessible. Disputes must be identified and classified through a dispute typology. A dispute resolution strategy and system should be developed and rolled out. Disputes be represented as spatial units and published as such.
15. Improve quality of all data, incrementally over time.

Convert – Country Level

1. Establish a legal framework to allow for conversion between tenure types along the continuum.
2. Take steps for upgrade along a continuum of land rights recordation including:
 - a. Publication of conversion options between tenure types including to formal registration.
 - b. From (recognised) trusted third Party or external administration to National Land Registration
 - c. From customary inheritance rules (included into the National Tenure Atlas per tenure type) and other accepted social rules, to notarised processes and full legal protection.

- d. Transactions made possible between parties, spatial units, between (shares in) rights etc. Transactions types (see overview conversion). This means that all possible transactions have to be identified and prioritised for classification.
3. Include legacy and historical data, for example reconstruct of situations using historical data (situation before illegal eviction, displacement, “land grabbing”, etc.)
4. Technical conversions Analogue/Digital, homogenisation, map improvements etc
5. Link data to the source (within SDI source documents). Today all digital data (spatial and thematic) can be stored in a Data Base Management System (DBMS). Information products are becoming flexible combinations of digital data components and additional facilities and services. This can replace the exchange of copies of data sets between organisations. Multi source Information products require avoidance of redundancy and good standardisation protocols.
6. Develop linkages with paper-based systems.

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