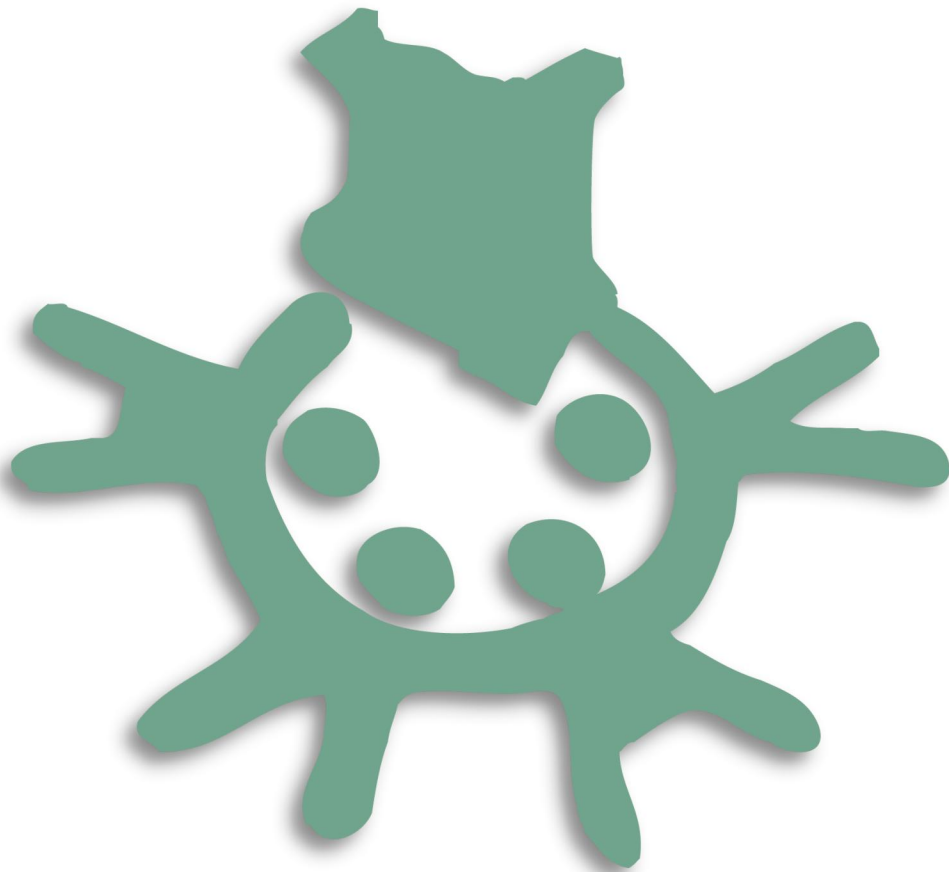


Technical Considerations for Establishment of Community Land Registers

*Information Requirements for Application in Informal
Settlements*



Pamoja Trust

Creating Voice And Space With The Urban Poor

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Acronyms

ADR	Alternative Dispute Resolution
ASAL	Arid and Semi-Arid Land
CIPSODAR	Capture Input Process Store Output Decision Action Results
CLA	Community Land Act
CLR	Community Land Register
CMIS	Content Management Interoperability Services
DIKW	Data, Information, Knowledge, Wisdom
GLTN	Global Land Tool Network
ICT	Information Communication Technology
IS	Information System
MLPP	Ministry of Lands and Physical Planning
NLC	National Land Commission
NLIMS	National Land Information Management System
NLP	National Land Policy
RDBMS	Relational Database Management System
SDGs	Sustainable Development Goals
SOP	Standard Operating Procedure
STDM	Social Tenure Domain Model
UN-Habitat	United Nations Human Settlements Programme
WGICLA	Working Group on Implementation of CLA

1. Introduction

Land is a very important resource globally more so with its role in attaining the Sustainable Development Goals (SDGs) (United Nations, 2016a). In Kenya, land is critical to the economic, social, political and cultural development of the country. Its development and management is crucial to the attainment of economic growth, poverty reduction and gender equity. Secure access to land, sustainable land use planning and equitable distribution of land are very important for food security and nutrition security, employment, growth of industries, attraction of foreign investors, foreign exchange earnings and generally the socio-economic development of the country (Government of the Republic of Kenya, 2013).

About 66% of land area in Kenya is classified as community land, with about 22% under private ownership and 12% being public land. Over 80% of the total area lies in arid and semi-arid land (ASAL) characterized by low agricultural potential, leaving only 20% of land mass occupied by 75% of the country's population. The rural-urban balance stands at 78% and 22% respectively (Mbote, 2016). Although land adjudication and registration has been ongoing, still a majority of Kenyans lack security of tenure, which, as a result, hampers economic development as land, is one of the critical factors of production.

In addition, the effects of rapid urbanization have significantly contributed to the development and growth of informal settlements, which are characterized by a lack of tenure security (UN-Habitat, 2005). More than 34% of the total population in Kenya lives in the urban areas with 71% of this confined in informal settlements. The annual growth rate of informal settlements in Kenya is 5%, the highest rate in the world, and it is estimated that the rate is likely to double in the next 30 years if positive intervention measures are not put in place. The fact that residents of informal settlements in Kenya have no security of tenure over the land that they occupy or possess subjects them to the possibility of eviction and has been a major barrier to improving services and other basic infrastructure (Brueckner & Lall, 2015).

The National Land Policy (NLP) (Government of the Republic of Kenya, 2009), which came into force in December 2009, called for the extensive overhaul of current policies and institutions in an attempt to address chronic land tenure insecurity and inequity. It recognizes the absence of tenure security as a key challenge hindering land planning and development in informal settlements. To deal with the challenges presented by squatters and informal settlements, the policy recommends the Government to establish a legal framework and procedures for transferring unutilized land and land belonging to absentee land

owners to squatters and people living in informal settlements.

The Community Land Act (CLA) of 2016 gives effect to Article 63(5) of the Constitution of Kenya 2010 to provide for the recognition, protection and registration of community land rights; management and administration of community land; the role of county governments in relation to unregistered community land, and for connected purposes. It secures the interest of communities as far as ownership of community land that is under control of a community is concerned. While the law is designed to address tenure for pastoral and other poorer rural communities, Mbote and Odote (2015) argue that there is a basis for vesting land in informal settlements on residents of the areas based on a “community of interest”. While the definition of a “Community” in the CLA leaves it open for interpretation in the context of an informal settlement, it can also be argued that slum dwellers represent a community with a homogeneous socio- economic interest or other similar interests. This argument presents an opportunity to test the applicability of the law in informal settlements in a push towards tenure regularization, where such a pilot intervention would help improve normative knowledge as well provide valuable lessons on the development of a legal and regulatory framework for improving tenure of urban slum dwellers.

One of the key components of the CLA is the Community Land Register (CLR) which is designed to provide accurate and reliable information about ownership and composition of the community; textual and spatial attributes of the community land; and, record of transactions, including conversions, on the land. The register is required to be an absolute record of proof which guarantees and protects community land rights hence its design, implementation and maintenance needs to be clearly defined from a technical, legal, regulatory and institutional perspective. This report provides key technical recommendations using two analytical models that respectively look at the structural and process design of the CLRs.

2. Structural Components of a Community Land Register

The CLR is a social-technical information system that contains area, ownership, community composition of community land. It should provide evidence/proof of land rights including of the transaction, of the parties involved, of the land involved, of the acceptance by the community (UN-Habitat, 2012). According to Heeks (2006), an information system (IS) is described as "a socio-technical system of information, people, tasks and technology that accepts, processes, stores, and outputs information for decision-making or learning". As an information system, the establishment, maintenance and integration to national land information systems - such as 'ardhisasa' (Government of Republic of Kenya, 2021) - should be based on participatory approaches that involve the community members, county and national government authorities, Civil Society Organizations (CSOs) and development partners. The composition of the CLR and roles of the different aforementioned stakeholders can be further described using the 'onion-ring' model shown in Figure 1 below.

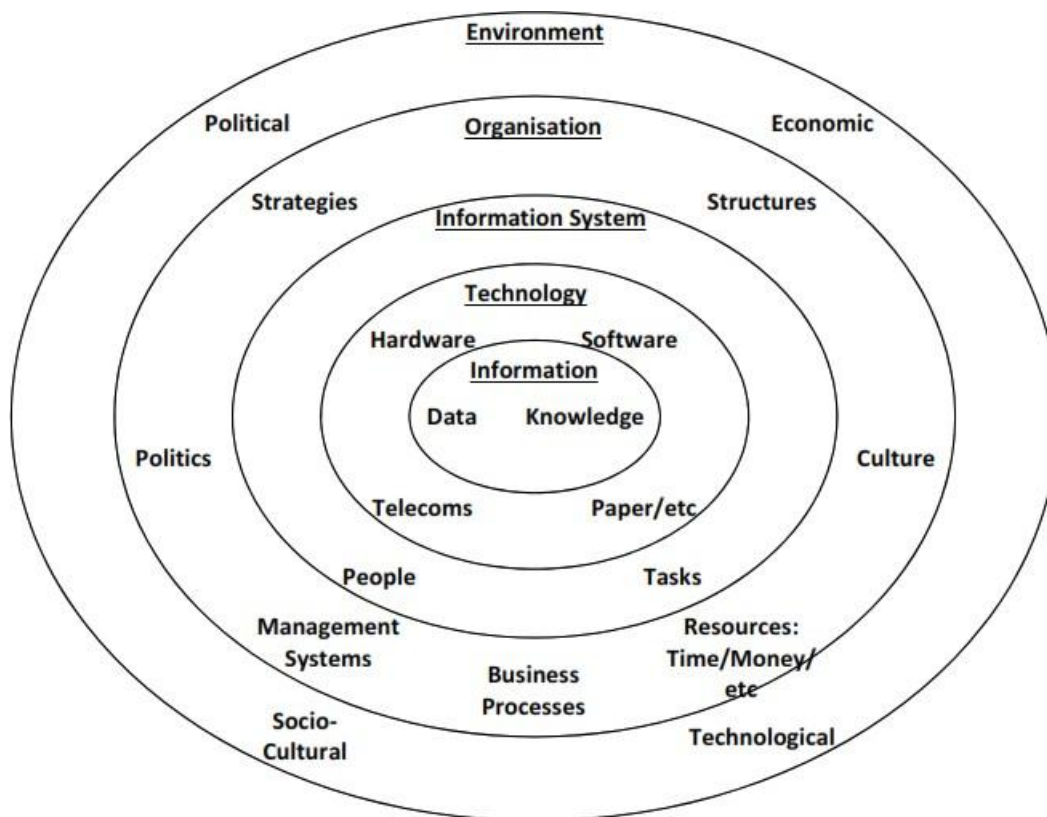


Figure 1: 'Onion-ring' model for information systems (Heeks, 2006)

2.1. Information Layer

This layer is based on the Data, Information, Knowledge, Wisdom (DIKW) Pyramid as shown in Figure 2 below where each building block, starting with data, is a step towards a higher level that answers different questions about the data and how it adds value to it (the block). This process can also be iterative where new knowledge and wisdom can be used to perform further analysis on the data in order to get more insights on specific issues.

The DIKW model can be applied to the CLR to support two fundamental purposes of the CLA i.e. to provide tenure security on community land and, to manage the use and development of the land. By using the lens of the model, it is possible to get answers to such questions as who are the bonafide community owners of the land, where is the land located, what are the community priorities, what are the root causes of conflict etc. We will look at data and information buildings blocks in this section, and cover the Knowledge and Wisdom blocks under Decision, Action and Results in section 143.6.

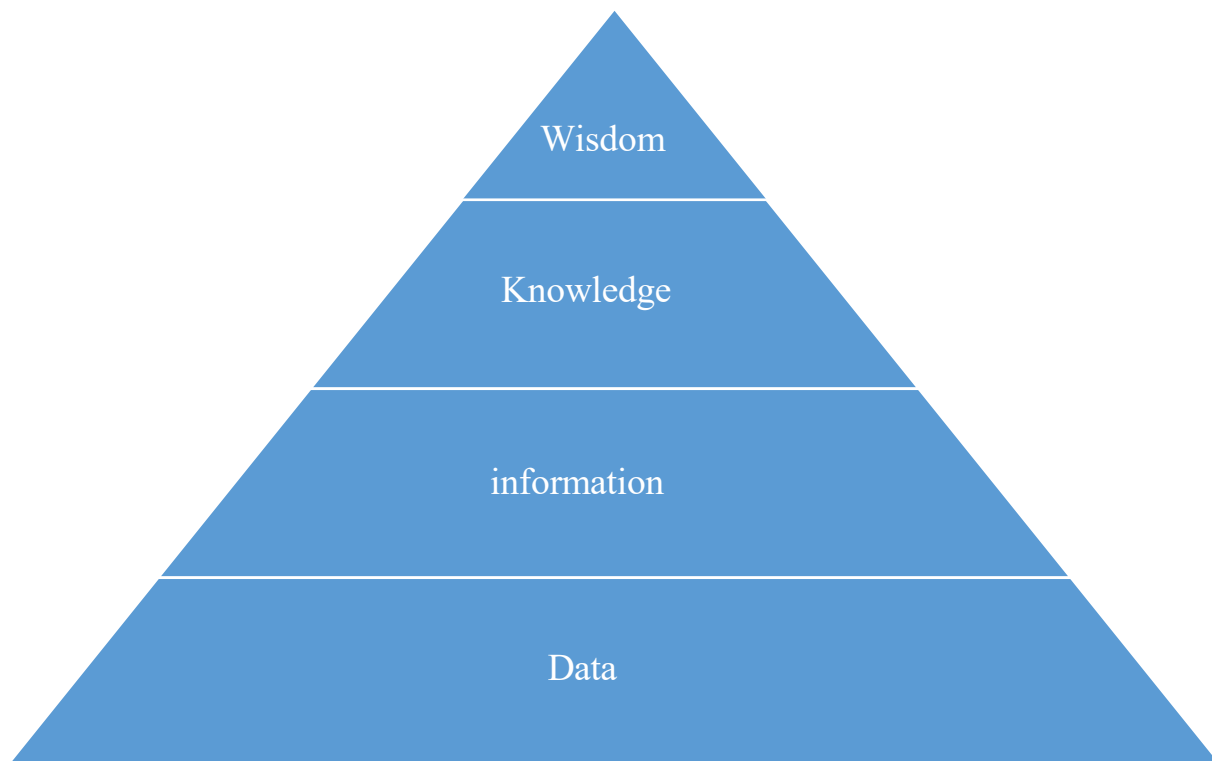


Figure 2: The DIKW pyramid (Frické, 2019)

Data is defined as a collection of related non-random facts obtained by observation or research and recorded. The CLA (2016) and Community Land Regulations (2017) provide a generic framework describing the key data that should be contained in the CLR, these include:

- Cadastral map
- Name of the registered community
- Register of community members
- Representatives of the community
- User of the land
- Specifics of the community members as may be determined by the land registrar
- Transactions on the community land including land type conversions

While this provides a good basis for the establishment of the data model for the CLR, it is still missing some key details on the logical grouping, organization and relationship of the conceptual representation of the data. The Social Tenure Domain Model¹ (STDM) can be used as the basis for the core data model of the CLR as shown in Figure 3. The elements in the model can be described as follows:

- A community is a grouping of multiple natural persons;
- The natural persons in a community can also be grouped as households where each household can still constitute natural persons who are not necessarily in the official community register such as minors;
- The validity of a community is supported by such documents as signed application forms, certified copies of minutes, rules and regulations of the community etc.;
- A community has a one-to-one relationship with community land evidenced by a certificate of title or a certificate of lease;
- Community land is a spatial representation which contains one or more community facilities.

It is important to note that this is a basic data model which can be expanded to include more context-specific entities and attribution such as agriculture, grazing, commercial-related data. It can even be refined further to represent the assignment of each community member to the corresponding spatial block within the community land.

¹ Further discussed in Chapter 4

Liew (2007) defines information as more refined data that is useful for some kind of analysis. The basic model in Figure 3 can provide a variety of information including, but not limited to:

- Bonafide members and representatives of the community;
- Tenure type that the community has with the land (i.e. lease or ownership) with supporting documents;
- Any conflicts related to the land;
- Available land for land use planning;
- Demographics of the community;
- Developmental priorities of the community etc.;

By asking relevant questions on ‘who’, ‘what’, ‘when’ and ‘where’ on the data in the CLR, it becomes possible to derive valuable information and make it more useful for different contexts such land valuation, infrastructure development, provision of basic services, education, health etc.

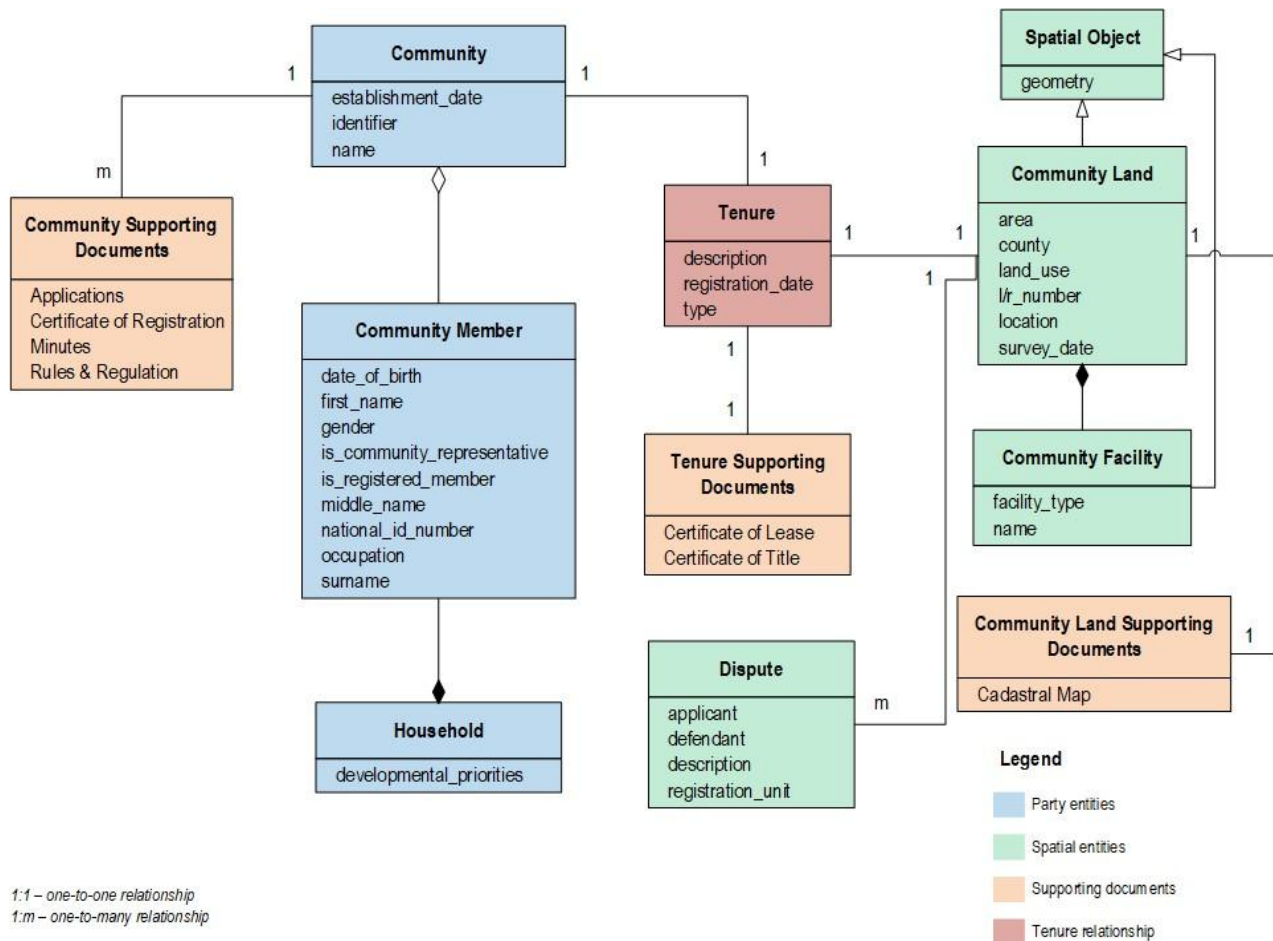


Figure 3: Basic data model for community land that is based on an adaptation of STDM (Gitau, 2022)

2.2. Technology Layer

It is important to choose a technology ecosystem for the CLR that is inherently people-centric by using tools and approaches that are not only affordable and scalable but, more importantly, can also be quickly rolled out based on the technical capacity of the local land stakeholders particularly the communities. Hepworth (2007) emphasizes the importance of understanding the users of electronic information products and services during their design and development stages, hence it will be important to undertake a capacity assessment during the inception stages of establishing the CLR to identify the most appropriate suite of complementary digital and paper-based technologies for data collection and management.

Due to the cost and additional overhead of maintaining a system that is always connected to a remote server through an active internet connection, a standalone system is preferable where the data is stored locally in a computer located in the office of the respective community land registration unit e.g. at the county or a lower administrative level. Such a system can then intermittently connect to the internet to synchronize the data with the primary server hosted or managed by the Ministry of Lands and Physical Planning (MLPP). The frequency of synchronization will be determined by a number of factors such as frequency of data updates in the Register. Key features of the CLR system, with some open source examples, include:

- A Relational Database Management System (RDBMS) that is ACID² compliant when processing transactions to ensure their integrity. Examples includes PostgreSQL, MySQL, Spatialite;
- Ability to store geospatial raster and vector data e.g. PostGIS extension for PostgreSQL;
- Ability to maintain an audit trail where each operation on the data is monitored and stored e.g. which data was accessed, which user account accessed it, when was it accessed;
- Integration of logical security measures such as use of passwords, encryption of data and authentication of requests for any data operation;
- Ability to perform automated data backups using custom scripts or data management tools;
- Ability to manage documents with support for document versioning using open standards such as the Content Management Interoperability Services (CMIS) e.g. Alfresco;

² ACID – Atomicity, Consistency, Isolation, Durability

- Ability to visualize and perform simple spatial analysis e.g. QGIS, PostGIS, GeoDjango;
- Ability to generate simple reports that might also include maps e.g. QGIS.

These are just a few guiding technical features for the CLR system and which can be further refined during the actual design stage of the system. It is important to ensure that a system-agnostic data exchange format is used for integrating the CLR data with the NLIMS.

2.3. Information System Layer

As defined earlier, the CLR is an information system that consists of information, technology, people and tasks. While the law defines the role of the land registrar as the primary custodian of the CLR, it does not describe other stakeholders of the Register (or IS) and their respective roles and responsibilities. Hence, it will be important to define how changes in the Register will be captured and who will be responsible for this. It will also be important to define the role of the community in maintaining the Register. Hence, an information management Standard Operating Procedure (SOP) manual will need to be developed that contains guidelines and responsible parties with regard to classification of users with access to CLR; data access, updates and backups; confidentiality; monitoring, authorizing and revoking access to the Register; operation procedures etc. Ultimately, this needs to be complemented and draw upon the national policies and legal frameworks such as the Data Protection Act of 2019

2.4. Organization Layer

There are two facets to the ‘organization’, these are:

- The county office at the community land registration unit where the CLR will be located;
- The MLPP, which will be the primary custodian of all CLRs.

While there is an existing roadmap developed by the MLPP, through the Working Group on Implementation of CLA (WGICLA), it will be important to ensure that:

- A detailed implementation strategy is developed based on the key milestones in the roadmap. This should include various elements such as capacity development; change management; resource mobilization; partnerships and collaboration; public participation and sustainability;
- There is adequate funding to roll out and sustain the implementation of the CLA including the establishment of management and operational structures at the Ministry and at the land registries in the counties; awareness and advocacy; recruitment of personnel including land registrars; setting up physical office space etc.;
- Detailed SOPs are developed for opening, updating, converting CLRs as well as on dispute resolution building upon the guidelines provided in the regulations;
- The CLR is not developed in isolation but rather as part of the broader land registry where it will be located with emphasis on strengthening the GIS services at the county level (Mutua & Mwaniki, 2017).

2.5. Environment Layer

Forces outside the MLPP and NLC will influence their internal functioning when it comes to the management of community land. These forces include:

- Economic Forces – the country’s economic landscape i.e. availability and allocation of domestic funding to the land sector will influence prioritization activities by the land authorities at the national and county levels. Hence, it will be important for these authorities and partners to come up with innovative financing mechanisms as part of the resource mobilization strategy, highlighted earlier in 2.4, to finance registration of community land.

GLTN provides a number of guiding frameworks on land-based financing which are premised on the fact that land is a key factor of production and an important source of financing for development, including infrastructure, social housing and basic services (UN-Habitat, 2016b);

- Political Forces – Political goodwill and commitment will be a key contributor to the success of the CLA. There are two possible types of manifestation of political will. First (and most unlikely) is top leadership support where the President emerges as a champion of community land and promotes its entrenchment throughout the political establishment, government and communities. Two, is when top leadership provides an enabling policy, financial and programme environment for key land institutions at the national and county levels to fully expel their duties in registering and managing community land. Some of the key factors that will be important in generating political will include use of: i) evidence and consideration of the socio-cultural, political and economic context to frame community land; and, ii) well networked community land champions and strong national advocacy institutions familiar with the salient socio-cultural and political sensitivities and concerns related to community land and how to effectively participate in policy development and implementation processes;
- Technological Forces – Kenya is an internationally recognized for its innovative Information Communication Technology (ICT) sector that has been characterized by a thriving technology environment that is home to the most cutting-edge startups in the continent. As such, it will be important to ensure that key ICT players –both state and non-state – are involved in the design, development, testing and rollout of the CLRs including their integration with other national information systems such as ‘ardhisasa’ and ‘e-citizen’. It is also important to note that the National Information Communication and Technology Guidelines (Government of the Republic of Kenya, 2020) will influence the information requirements of the CLR particularly the four priority areas: mobile first; target market; skills and innovation; and, public service delivery. It is important to note that ICT is not just about technology but it is about the ways in which information and technology are used to deliver better services and enhance trust and confidence in land administration and government (UN-Habitat, 2016c).

3. Process Description of a Community Land Register

Information adds value to organizations by contributing to the decision-making process; hence, in order to take decisions, people need information. Therefore, the key relationship between people, organizations and information is that between decision-making and information. When designing CLRs, it will be important to ensure that the data in the Registry is used to make decisions and take actions that ultimately lead to securing the land tenure rights of communities. The Capture-Input-Process-Store-Output-Decision-Action- Results (CIPSODAR) model, as shown in Figure 4, can be used to inform the design of the CLR IS. The first step is asking what Results are to be achieved, then finding out what Actions and, hence, what Decisions need to be made in order to deliver those results. Then working back to find what Information is needed to make those decisions. And finally working back again to find what Data you need to capture (and process) in order to create the required information.

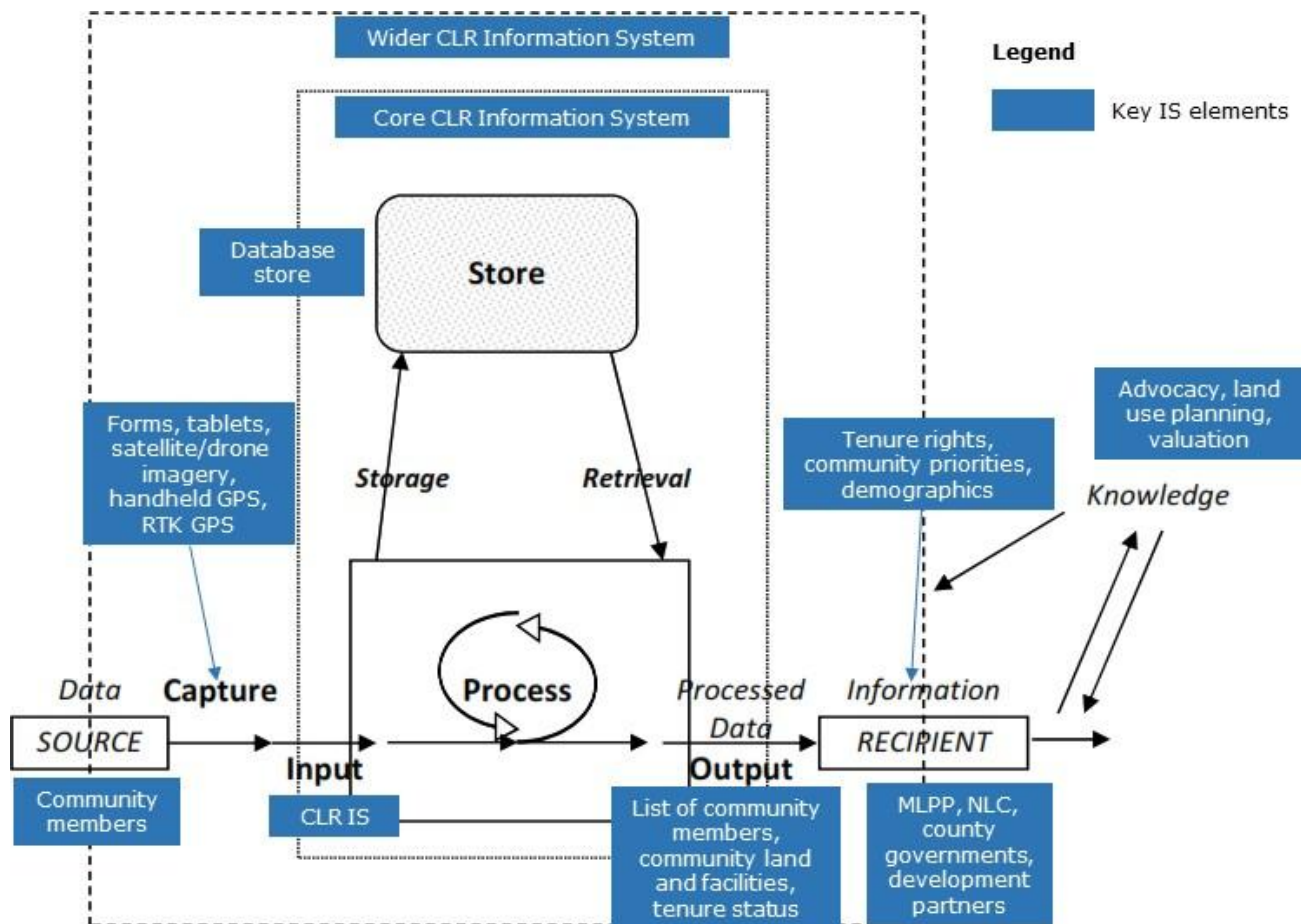


Figure 4: CIPSODAR model applied to the CLR process

3.1. Capture

The regulations already provide various templates for application forms used to register communities, corresponding community land, dispute registration etc. It will be beneficial to complement this with digital forms that allow the data to be captured using handheld data collection devices such as tablets. This will help improve data accuracy and integrity; provide extra capabilities such as collection of additional binary data such as photos and fingerprints; improve productivity by reducing time for data capture in the field.

High-resolution drone or satellite imagery can be used to overlay the cadastral maps to help provide spatial orientation of the location of land. The imagery can also be used to capture additional base datasets such as infrastructure, utilities, grazing land, water resources etc. The cadastral maps will be captured in accordance to the guidelines stipulated in the Survey Act and Land Registration Act respectively using such devices as handheld GPS, RTK GPS etc.

3.2. Input

The data - captured using the different application forms - will need to be reviewed by the land registrar and, if it passes all the quality control checks, then it can be manually entered into the CLR IS, with the paper forms scanned and also imported into the system. If the forms will be captured using digital techniques, then they can be downloaded, staged for manual review before being automatically import into the system. The high-resolution imagery can be directly imported into the system for visualization and overlaying with other spatial datasets including the cadastral map. Finally, the IS should provide an interface for linking the community data (members, supporting documents etc.), cadastral maps, dispute data etc. by using, for instance, a unique identifier that is manually entered or automatically generated by the system.

3.3. Process

Once the data has been entered, the CLR IS can run a number of automated checks and processes such as validating the L/R number of the cadastral map against the NLIMS; checking if the national I.D. numbers of community members exist; sending alerts to relevant authorities of new or updated registrations in the system; synchronizing the data with the NLIMS; perform analysis and produce analytical reports that are designed to be generated automatically etc.

3.4. Store

The processed textual and spatial data can be stored in an RDBMS at both the local land registry as well as in the NLIMS, with the latter designated as the primary database. Scanned documents and photos can be stored as flat files with their corresponding metadata also stored in the backend database and linked to the specific community and/or the respective members. A comprehensive data model that builds upon the one shown in Figure 3 can be used as the basis of designing the database schema for the CLR data store.

3.5. Output

The CLR IS can be used, say upon approval by the Ministry of community registration through NLIMS, to generate various documents such as certificate of (community) registration, certificate of customary use and occupancy, certificate of title or lease etc. Depending on the level of customization of the data model, it can also be designed to produce context-specific analytical reports such as community demographics, socio-economic development priorities, health-issues, required agricultural inputs and services etc.

3.6. Decision, Action, Results

The type of decisions reinforced by the CLR could be categorized as hybrid as they include both structured/hard decisions such as the tenure status of the community and unstructured/soft decisions such as including those related to disputes and other context-specific issues and challenges faced by the community. The hard information, documents and analytical reports provided by the Register can facilitate decision making at the three levels, that is, at the operational, tactical and strategic levels (Bocij, et al., 2019).

At the operational level, the tabular and map information was used to validate the data collected for the registered communities. This process can result in more accurate community data (including membership) to support analysis and higher-level decision-making.

At the tactical level, the information can be used to identify those communities that are eligible to receive the corresponding certificates based on the tenure status. This can also be used in Alternative Dispute Resolution (ADR) processes to ascertain tenure status, boundary extents, access to and use of community resources etc. Based on the community development priorities, the information can be used by local and national stakeholders to mobilize funding for various development initiatives such as infrastructure development, housing, improve access to water; community agricultural, health or educational resource centres etc.

Hence, at the strategic level, the initial experiences, challenges and lessons learnt in registering community land, as well as community profile and cultural dynamics, can be used by stakeholders to lobby policy makers to amend the regulations, as well as other legislation related to land use and management, in order to make it more fit-for-purpose.

4. Existing Land Information Tools

The Social Tenure Domain Model³ (STDM) can be considered to provide the basis for establishing the CLR. STDM tool allows for the recordation of all possible types of tenures; STDM enables to show what can be observed on the ground in terms of tenure as agreed within local communities. Conventional land administration systems cannot easily handle customary and informal tenure systems. The concept of the Social Tenure Domain Model - as shown in conceptual model in Figure 5 - is to bridge this gap by providing a standard for representing ‘people – land’ relationships independent of the level of formality, legality and technical accuracy. The STDM is also a ‘specialization’ of the ISO-approved Land Administration Domain Model (LADM). In this context, specialization means that there are some differences, which are mostly in the terminology and in the application area. LADM development took place in parallel of STDM development as a concept and a model, and that the core developers of both models are the same or supportive of each other. For example, any form of right, responsibility or restriction in a formal system is considered as a social tenure relationship in STDM. The STDM information tool provides the front-end interface for testing and applying the STDM concept and model. It is built on top of free and open source geospatial software products. The client is based on the QGIS open source framework, whereas the backend is based on a PostgreSQL/PostGIS stack for managing both spatial and aspatial data. The tool also provides basic document management capabilities for attaching supporting documents in line with the concepts presented in the analytical models discussed in chapters 2 and 3 respectively.

STDM tool was (and is currently being) implemented in many countries and in various contexts and purposes. While STDM is frequently used in improving security of tenure in informal settlements and customary areas, the tool is flexible enough and can be adopted for use as a CLR IS.

³ <http://www.stdm.gltn.net>

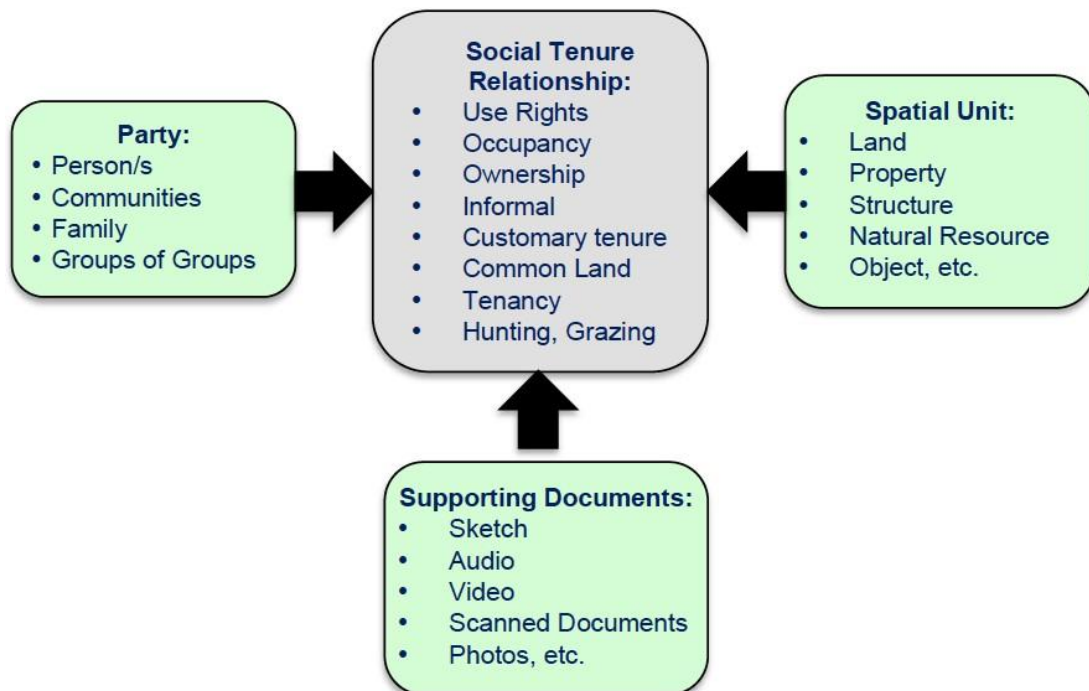


Figure 5: The STD Conceptual Model explains the interrelationship between parties, social tenure, and the spatial units supported by relevant documents (UN-Habitat, 2014)

5. Conclusion

While the concepts and recommendations presented in this document have primarily focused on the Community Land Register, they also highlight the importance of low-cost community-driven technology approaches for documenting community land rights in order to provide secure tenure for those communities in urban and rural areas that had been previously excluded from the formal land administration system.

Based on the presentation of the structural components in Chapter 2, it is evident that political factors in the environment layer of the ‘onion-ring’ model are the key drivers that can determine the success of the implementation of the CLA. As the saying goes that “knowledge is power” (Bacon, 1996), the acquired knowledge from the analysed information will help to create better services for all communities with secure tenure as an enabler and accelerator for socio-economic development and improved resilience against effects of drought and climate change. Finally, it will be important to adopt and integrate a multistakeholder approach in the implementation process in order to improve adoption, guarantee sustainability and strengthen knowledge on pro-poor land recordation practices.

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