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COMMUNITY LAND ADMINISTRATION ANALYSIS

AN APPROACH TO SUSTAINING COMMUNITY-BASED LAND RIGHTS DOCUMENTATION IN MOZAMBIQUE AND ZAMBIA

INTEGRATED LAND AND RESOURCE GOVERNANCE TASK ORDER UNDER THE STRENGTHENING TENURE AND RESOURCE RIGHTS II (STARR II) IDIQ

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Cover Photo: A community member in Maguya Chiefdom, Zambia, who has been trained to use a mobile system to report on land data. Brian O'Donnell/Tenure and Global Climate Change Program Zambia

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LIST OF ACRONYMS

API	Application Programming Interface
BPMN	Business Process Model and Notation
CaVaTeCo	Community Land Value Chain (Mozambique)
CLUP	Community Land Use Plan
CP	Cadastro Popular (Mozambique)
CRU	Create, Remove, Update
CSO	Civil Society Organization
DFID	Department for International Development
DINAT	National Directorate for Land (Mozambique)
DLA	District Land Alliance
DUAT	<i>Direito do Uso e Aproveitamento da Terra</i> (Mozambique)
FAO	Food and Agriculture Organization
GESTERRA	Capacity Building Programme on Land Management and Administration (Mozambique)
GIS	Geographic Information System
GoM	Government of Mozambique
GPS	Global Positioning System
IDIQ	Indefinite Delivery/Indefinite Quantity
ILRG	Integrated Land and Resource Governance Task Order
LADM	Land Administration Domain Model
LAS	Land Administration System
LTR	Land Tenure Regularization
LUP	Land Use Plan
MAST	Mobile Applications to Secure Tenure
MCC	Millennium Challenge Corporation
MLNR	Ministry of Lands and Natural Resources (Zambia)
NGO	Non-Governmental Organization
NLTP	National Land Titling Programme (Zambia)
NSDI	National Spatial Data Infrastructure (Zambia)
ODK	Open Data Kit

ORAM	Associação Rural de Ajuda Mútua
OSM	Open Street Map
RRR	Right, Restriction, Responsibility
SiGIT	Land Information Management System (Mozambique)
SPGC	Provincial Geographic and Cadastral Service (Mozambique)
STARR II	Strengthening Rights and Resource Tenure II
TCO	Total Cost of Ownership
TGCC	Tenure and Global Climate Change
TRUST	Technical Register Under Social Tenure (Tanzania)
USAID	United States Agency for International Development
ZILMIS	Zambia Integrated Land Management Information System

I.0 INTRODUCTION

This report was prepared under the United States Agency for International Development (USAID) Integrated Land and Resource Governance Task Order (ILRG) under the Strengthening Tenure and Resource Rights II (STARR II) Indefinite Delivery/Indefinite Quantity (IDIQ) contract. In it, ILRG recommends an approach to sustain community-based land rights documentation through land administration services catering to customary and local communities in Zambia and Mozambique. The recommended approach involves establishing shared community land administration services. The key innovations of this approach are a centralized or shared maintenance database to warehouse data from community-based land management processes and simple tools for communities to use to update the data and receive updated records. The technology platform and related services can be shared across communities at various levels of aggregation – most likely nationally or regionally. Generically, community land administration services reflect the core elements of the vision of Associação Rural de Ajuda Mútua (ORAM) and Terra Firma for a “People’s Cadaster” in Mozambique.¹ This report explains the recommended approach and why it makes sense for USAID to support under ILRG.

The purpose of this report is to test approaches for sustainable, scalable land administration services for customary and local communities that have legal and socially legitimate authority to document and manage the land and resource rights of their territory or land holdings. In Zambia and Mozambique, the prevailing land tenure in rural areas fits this description. ILRG is investing in a proof of concept activity for land administration services shared across communities. Joint technology platform development for both countries has been considered as an ideal approach; however, timing and the availability of funds from other donor sources in Mozambique makes this unlikely. Nevertheless the two country programs will compare approaches for complementarity and learning. ILRG’s objective is to support affordable access for customary and local communities to services that update and maintain records of their land rights in a manner that is compatible with the public land administration system (LAS). The outcome will be sustainability of first documentation of community land rights (which USAID has and will continue to support under ILRG) and of the benefits of documentation to land rights and resource management.

In this report, ILRG explores the **why, what, and how** of the recommended community land administration proof of concept, including background and justification for such an activity for Zambia and Mozambique; the conceptual framework within which ILRG’s investment in community land administration is envisioned; and ILRG preliminary design considerations (behavior patterns that define user needs, technology choices, and sustainability). For both countries, ILRG carried out a rapid assessment (see Annex 1 for methodology) of the behavioral norms related to community land management and the range of transactions that are typical.² A review of existing land administration systems and customary documentation approaches was also conducted in each country. Annexes 2 and 3 characterize the background scenario in each country. Relevant findings are also relayed as the preliminary design considerations are described.

—

¹ Ribeiro & Norfolk, 2018.

² The Global Land Alliance provided a methodology for assessing customary land administration institutional capacities which goes beyond the need of this report to include broader guidance for the implementation of the conceptual model shown in Figure 1. The broader methodology is aimed at service providers charged with assessing how customary land administration structures work and supporting community-based land management processes including land rights documentation. To scope the design of community land administration, the assessment methods related to types of changes to land rights and the behavior patterns around such changes that must be understood to design workflows for the proposed community land administration are used for this report and presented in Annex 1.

2.0 BACKGROUND

2.1 COUNTRY CONTEXT

There are two types of land tenure in Zambia: land administered by the state and leased to the proprietors, and land administered by chiefs (or traditional leaders) and owned by community members. In Mozambique, all land is owned by the state, with statutory lease or occupational rights (both referred to as *direito do uso e aproveitamento da terra* [DUAT]), either being awarded by the state or accruing to users by operation of the law. Local communities, as defined in the Land Law, have statutory powers of land administration over areas where they have acquired communal DUAT, which may be delimited and certified by the state. In Mozambique, there is no “customary land” as such; rather, the law recognizes the existence of customary rights (and other informal and undocumented rights) over areas of state land and provides these with statutory protection.

The overwhelming majority of the land in both countries is therefore administered by chiefs (and their customary structures) or community land authorities. Whereas state land is of direct concern and subject to correspondent authorities to register and maintain, community land has historically been administered through decentralized and (usually) locally legitimate processes. State land records are maintained in the national cadastral registration systems – the Land Information Management System (SiGIT) in Mozambique and the Zambia Integrated Land Management Information System (ZILMIS) in Zambia – while community managed land and customary land both sit outside of the government systems. Due to the invisibility of community and customary land management processes to national actors and the lack of formal documentation systems, they are often criticized as lacking transparency and being subject to arbitrary decisions. Furthermore, while community/customary rights are protected to varying degrees in legislation, they are often perceived to be less secure than state-administered rights.

With economies that are rapidly growing and experiencing high demand for land for investment, both Zambia and Mozambique are seeing an increase in conflicts over land among local land users and between local people and investors and state interests. Local people with legitimate land rights, but who lack documentation, are also having difficulty using their land to access finance or support local development. Population growth and climate change are both making good land scarcer, as well as influencing internal migration to previously undeveloped areas. These forces make the need for documenting and maintaining up-to-date information about land rights more immediate.

Capacity and budgetary constraints, as well as lack of prioritization, prevent many countries from extending formal land administration structures down to the village level. State-run LASs are also largely inaccessible or of little use to most rural landholders for other reasons, including:

- Overly bureaucratic processes and documentation requirements;
- Policy and legal changes that are unknown to or beyond the reach of most small farmers;
- Services that are housed and managed at a long distance from where rural landholders live;
- High costs to register and/or transact rights;
- Uncertainty with respect to the timeframe for the process to be completed; and
- Lack of transparency in the land information for the public to easily access records.

In the above context, the provision of land management services that are accessible and legitimate by customary or community organizations constitutes an important “public good” in areas rarely reached

by state land administration. Recently, demand has been growing to formalize customary and community land holdings and the processes around community and customary land management. The latter includes internal identification, delimitation or demarcation of household boundaries, and issuance of documents – certificates of customary ownership or certificates of occupation for proprietors, occupants, householders, lineage group, and others’ rights within a community land or territory. In addition to community members themselves, businesses, international donor projects, investors, government authorities, and customary leaders are also interested in documentation of customary land. Each has their particular interests related to protecting the rights of existing inhabitants, opening up areas to commercial use, reducing risk of conflict, and generating tax revenue.

There is also growing recognition of the relevance and importance of customary or community authorities and norms in documenting land rights, providing a base for more inclusive and sustainable development. Yet customary and community authorities remain largely ignored and under-resourced and are rarely integrated into the wider land administration architecture of their respective countries, beyond generic representatives of communities for the purposes of consultation and consent. The customary and community systems in many countries today have also endured a long “us vs. them” relationship with national land governance institutions rooted in their colonial and post-independence histories.

Customary systems can enjoy some degree of legal recognition by their respective national governments, at least in principle, and in many countries this recognition extends to the local rights allocated and managed by these systems. Even where the role of customary structures is formally recognized, however, the content and consequences of the work they do is rarely if ever integrated into or recognized by the formal public land administration. Customary systems continue to deal with local conflicts using traditional approaches, which often do not include any kind of mapping or modern technical support, including documentation of resolution processes. Local rights administered in this way remain invisible to outsiders and vulnerable to capture by external interests. In the last decade, community-based, tech-enabled, participatory approaches (e.g., Mobile Approaches to Secure Tenure [MAST]), have begun to make these rights visible by providing first documentation (maps and certificates) of the rights of communities and community members to land and resources.

In both Zambia and Mozambique, customary and local community land rights are recognized in law and prevalent in rural areas, which cover most of each country’s land area. These lands are under the authority of customary or local community organizations/authorities. While each country’s normative framework is unique, in both cases community-based documentation of land rights is allowed as a basis for establishing the boundaries of communities’ lands and for documenting the rights of use, access, and ownership of community members and outsiders. In both countries efforts to modernize national land administration systems are advancing with ambitious goals for systematic formalization/titling. However, these are not yet effectively inclusive of and accessible to rural communities and in Zambia’s case do not cover customary lands by design.

In both countries, this reality gave rise to pilot projects using community-based, technology-enabled MAST approaches to document customary and community land, demonstrating cost-effective methods and tools to document land rights. Approximately 30,000 parcels of land under customary rights have been delimited and locally certified in Mozambique and Zambia over recent years using techniques in line with MAST approaches. In the Tenure and Global Climate Change (TGCC) pilot in Zambia, communities across five chiefdoms (including one state-managed resettlement area) documented the rights of over 16,000 parcels, with certificates subsequently distributed to households. In Mozambique, a Department for International Development (DFID) pilot saw the formal delimitation of 20 community areas covering 66,000 ha of land in total, and the subsequent documenting of household rights in respect to 42,500 ha of this land, through the issuance of 10,200 certificates. The USAID Responsible Land-

Based Investment Pilot achieved 1,733 certified parcels in the names of 1,885 rights holders. The DFID pilot results were achieved at a cost equivalent to approximately USD\$25 per parcel.

While the numbers of records cited above is notable given the lack of precedent, today only a small portion of community land in either country has been systematically documented at the community or household levels, with millions of households standing to benefit from processes that document and support administration of community land rights. The certificates are socially legitimate and legally valid records of land rights. In principle, certificates are expected to be formally recognized by the state and have the potential for use by other key institutions, such as microcredit, insurance, and agricultural input providers and future development partners³. They are anticipated to enable locally based development through access to credit, reduce disputes, and facilitate contractual agreements between local land users and external interests – public and private – who want to use local land for development activities. In some cases, ILRG is observing state pressures on customary land, for example the creation of new township boundaries. The use of certificates is being monitored to identify how effectively certificates protect the rights of existing landholders.

In both countries, where pilot activities have occurred customary and community authorities have paper copies of their land records as do community members, and digital copies of these records are held by the civil society organizations (CSOs) that supported the initial documentation process. Additional data collected in the process of documenting land rights (e.g., information about other resources and demographics) is also held currently by these CSOs. The data on other resources and demographics is not necessary for land rights recognition yet it is of great interest to government, particularly local district authorities responsible for integrated development. That these locally-based (district or province-level) CSOs are holding the data is less than ideal for several reasons including capacity limitations and long-term role appropriateness; risks around data loss/protection; and sustainability based on cost effective provision of easy to access records and processes for updating records.

Essentially, these records are stuck within project files or databases that were designed for the first-time registration of land rights facilitated by local CSOs. Yet it is clear that the rights documented within a customary territory or community land holding are not static, and changes happen similar to changes in other types of land holdings – inheritance, gifting, leasing, subdividing, selling of rights, etc. Over time, if changes go unrecorded, the documentation produced under the pilots will fall out of sync with the on-the-ground reality, reducing their utility for locally based development and implying another round of investment in recording rights later on to again bring reality into alignment with records. Hence there is a need for long-term maintenance systems for these records.

In both countries, the long-term maintenance of land records has not been a priority for community leaders or civil society, in part because the initial excitement of having documentation superseded the long-term challenge of keeping the records up-to-date and the complex social, economic, and technological issues facing community land administration. Evidence supports that the risk of reversion to informality is real for the TGCC investments, ongoing ILRG investments, community land value chain (CaVaTeCo), and other community-based land documentation pilots in Zambia and Mozambique – as it is globally for state and community-based land registration efforts.

In 2018, the TGCC CSO partners in Zambia received 120 formal requests for updates to certificates (including subdivisions, transfers, and corrections) across three chiefdoms and a few thousand certificates. Anecdotally, there have been significantly more verbal informal requests or indications of need. Yet, despite efforts in training community land administration structures in Zambia to request changes to certificates with the local CSO partners and subsequently update local records, the CSO

³ In Zambia, draft land policy provisions that will recognize the rights of customary leaders to document local rights are expected to be adopted in 2020.

partners are not entirely prepared technically, institutionally, or financially to support long-term administration needs. Centralized technical backstopping is required.

In Mozambique, Terra Firma and ORAM present a structure for backstopping through the proposed Cadastro Popular platform, which may address the technical and institutional requirements that are lacking in Zambia; however, financial sustainability remains an ongoing constraint. Cadastro Popular would provide services and tools related to documentation and updating of community land rights, will have a market of three to 10 million parcels based on an estimated three million or more families lacking land documentation and anticipation of subdivisions and other changes to rights. In fact, ORAM has already received requests from an additional 20 communities to extend the DFID project coverage and has requests from four additional district administrations to commence work in their jurisdictions. In a paper presented at the recent International Federation of Surveyors Working Week, the National Directorate for Land (DINAT) reported an annual rate of change of 42 percent in regularized parcels and related ownership details;⁴ while this figure is undoubtedly at the top end of the spectrum, even a much lower rate presents a significant challenge in maintaining a cadaster of land rights.

2.2 JUSTIFICATION FOR ILRG INVESTMENT IN COMMUNITY LAND ADMINISTRATION

In both Zambia and Mozambique, ILRG is engaged in technical and policy discussions around scaling community and customary land rights documentation processes, as well as their links to national systems. While the processes and learning around first-time registration have resulted in robust workflows that are reducing costs and inclusively engaging stakeholders, the short and long-term administration of this data remains in flux. It is important that ILRG contribute to this community land administration learning, prior to (or at least alongside) scaling documentation processes, as many of the skills required for administration can be addressed cost effectively during a documentation process.

In both countries, twin challenges exist: how to meet the substantial demand for scaling up rights documentation, and how to sustainably maintain (archive and update) and provide access to the certificates that were and will be issued. ILRG's agenda includes support to scaling or expanding community-based land rights documentation and answering critical questions related to the sustainability of results: What is the best way to archive records and the data about the rights and rights holders these records reflects (technology/institution)? How do local communities manage changes to rights and what types of changes might they record? How and when will they record changes to the data? How will updated certificates be issued? Essentially, what is the best way to administer records from community-based land rights documentation?

ILRG is already engaging the first challenge. In Zambia, ILRG is currently supporting continued customary land rights documentation and is incrementally upgrading the technology tools used in TGCC for first documentation of customary rights, including adopting features from the Mozambique CaVaTeCo first documentation tool suite. In Mozambique, ILRG is also engaging communities in the first documentation process. However, in both countries, ILRG is approaching these efforts cautiously and in a learning, rather than scaling mode, until the second question has a stronger behavioral and technological basis for moving forward.

The second challenge – sustaining up-to-date records – requires land services that are relevant, accessible, easy to navigate, and affordable. While processes and best practices for community-led first-time registration have been well documented and are converging on a set of technologies, the subsequent administration and use of this data remains an open question in Mozambique and Zambia,

⁴ Balas, Carrilho, & Vaz, 2019.

both from a process and a technological solution perspective – one that USAID is beginning to address in other contexts (e.g., with MAST and Technical Register Under Social Tenure [TRUST] in Tanzania). The case is strong for USAID to invest through ILRG in tackling the sustainability challenge for Mozambique and Zambia. Demand exists and supply is limited, and by applying a similar approach in Mozambique and Zambia wherever relevant, the program can find cost efficiencies and learning between countries. The approaches will deviate to address differences in country needs; however, by investing in the coordinated development of administrative systems, the program may save resources (time, level of effort, and funds) and apply lessons learned from its application in either country.

Top-down reforms to address cost and access issues are not government priorities in either country; however, the success of activities in the field is building increased understanding by state actors. Community land administration is envisioned as filling a gap in the near term and ultimately creating a bridge to or with national land administration systems (national, provincial/regional, or local) and will be designed for compatibility legally (to the extent possible) and technologically. The community land administration approach is at least an important stop gap measure that ILRG considers worth the cost and is aimed at establishing affordable services that will be sustained over time. ILRG believes that the proof of concept investment will yield a suitable model and technology approach that can be used in other countries where the key factors enabling community land administration, such as legal empowerment of community authorities to manage land rights, are in place.

Developing the approach and technology platform for Mozambique and Zambia alongside one another is useful for learning purposes and for cost savings. Each country has a distinct colonial and post-independence legal and policy legacy and different approaches to treating community and customary land. At some level the basic problem to be addressed is the same even while the particular needs and opportunities differ. Doing the proof of concept for both countries as a collaborative initiative allows comparative learning about sustaining community-based land rights documentation through variations on aspects of community land administration, such as what type of organization hosts services, at what level of centralization services are provided, and how community land administration relates to state land administration services. ILRG may or may not use a common platform, given that in Mozambique other (non-USAID) donor funding may be used to develop a platform. If ILRG were to fully fund two separate models, the resources (time and person days, and therefore financial cost) involved in the planning and developing of those approaches would theoretically double. Similar platforms are likely to be designed or selected with the appropriate flexibility for customization as needed; the types of changes to rights and needs for data access (user requirements) can be supported by a common core set of system workflows. ILRG has a particular opportunity now to leverage likely investment by the Tenure Facility and possibly other donors in Mozambique in the Cadastro Popular initiative (continued piloting of community-based land rights documentation in different locations and support to community land administration approaches) that will help meet ILRG objectives in Mozambique and can provide learning for Zambia. Should ILRG engage in land administration or documentation activities in other countries, a separate analysis will be required and a different approach may be justified.

3.0 SUSTAINABLE COMMUNITY-CENTERED LAND ADMINISTRATION

3.1 A MODEL FOR SUSTAINABLE COMMUNITY-CENTERED LAND ADMINISTRATION

ILRG proposes to address sustainability of documentation of community and customary land rights through supporting the establishment of community land administration processes for Mozambique and Zambia. The land administration services that would be introduced include:

- Warehousing and managing changes to current and historic customary land rights data;
- Providing access to information about certificates issued (to public officials, rights-holders, others);
- Recording changes (updating); and
- Issuing new certificates (to additional parcels, as a result of changes to existing parcels and rights, or duplicates).

These land administration services as envisioned are justified as responding to the needs and demands of communities and customary authorities building on community-based land rights documentation. In other words, community land administration is part of a broader community-centered conceptual framework for land administration as summarized in Figure 2. A program to enhance and work with customary land management structures on land administration will aim to deliver the following main products:

- Maps and records of existing rights over a defined territory, with sufficient detail to clearly identify boundaries between land parcels;
- Updated maps and records as land rights change through sale, exchange, marriage, inheritance, sub-division, etc.; and
- Certificates and related documentation confirming and proving these existing rights and the changes that take place over time (updated or new certificates).

The existing rights documentation processes (steps one to five below) are largely covered in existing MAST documentation approaches. While specific steps differ among cases and countries, they tend to follow a general process that includes: 1) community sensitization and consent for the extent of documentation processes to be examined; 2) establishment/support for community land governance associations; 3) community boundary documentation alongside land governance and land

Figure 1: Delimited community and parcels



use data collection; 4) household-level rights documentation; 5) objections, corrections, and confirmations; 5) certification; 6) land use planning; and 7) administration of land data. The first six steps can take place over the course of a few months to a year (within the life of a development program), while step seven is an ongoing activity expected to last years or decades, long after the life of ILRG.

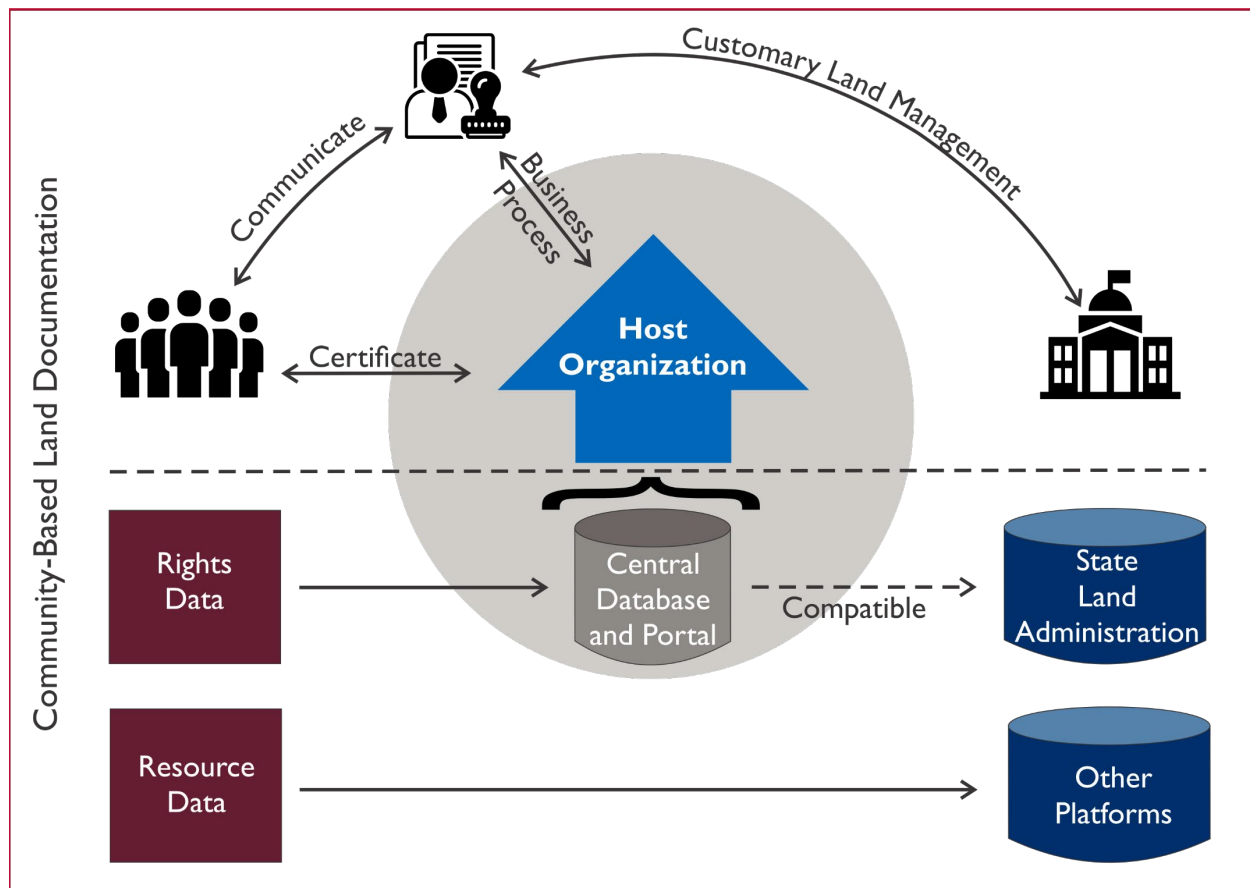
The data generated by steps one through six are currently held and managed in a database that maintains data as a snapshot in time. Community land administration innovations would update this database to be process-focused and designed to track systematic documentation of rights. To ensure security and reliability of the data, the database must be managed by professional technicians. Such a database underpins the security of the rights data being generated at the local level and can produce certificates and other documents that give land users visible and concrete proof of their rights and where they extend to. The result is a certificate confirming the land rights held over specific parcels, rooted in local custom and practice and validated by legitimate local community structures.

Once existing rights are mapped out in this way, the focus shifts to change management. This is in fact the principal role of a state land administration. Customary and community systems are no different; they too must deal with changes in land rights and land use due to land sales and subdivision, marriage and inheritances, and other agreements such as long-term leases or new rights-of-way. Capturing these changes in a form that can be recorded and certified also requires working with local people to understand the processes involved and how they are validated. Using the same techniques as those already employed for delimitation and parcel mapping, it is possible to generate data that can be stored in a central maintenance database and used to issue new certificates reflecting the changes that have taken place.

The outputs of this process are rooted in local knowledge and practice and are validated by structures and key figures whose legitimacy is accepted and recognized by the local community. However, if the certificates and maps generated by the community are to be recognized and accepted by institutions beyond the community, the integrity and reliability of the central maintenance database is fundamental. All the data generated should be stored in a maintenance database away from the community and managed by a competent technical organization. Some data and outputs from this process can and will of course be held at community level. Communities will hold sets of analogue data such as maps showing community boundaries and the borders of individual land parcels within the community, as well as community-managed resources like sacred areas, forests, or grazing lands, the location of public goods (schools, clinics, etc.), and related lists. They may also hold copies of other relevant documentation (for example, certificates of delimitation issued by the government in the case of Mozambique); and retain material such as timelines of local history and other artefacts produced during delimitation and parcel mapping activities. At the household level, individuals and households will have their own physical certificate or certificates covering the land they occupy and use and must assume responsibility for looking after these documents.

The conceptual framework for production and maintenance is in essence an ecosystem of human and technology-enabled, automated data functions for community-based land documentation, land transactions or change management records production and access, and inter-connection with other systems. Figure 2 below depicts this ecosystem, highlighting the community land administration model. The host organization will work with local service providers with a light footprint, operating agilely and virtually. The lower left side refers to MAST models for first documentation. The details of the first documentation approach is not displayed in this diagram as it is not the focus of this paper. One important feature of that work that is worth pointing out is that there are various intermediary organizations that engage with communities to carry out 1st documentation and they would be the most likely recipient of the training and technical assistance services from the community land administration host organization(s). The dashed lines indicate potential elements that connect community land administration with or even merge this within other relevant data systems and services.

Figure 2: Conceptual Framework for Sustainable Community-based Land Rights Documentation



3.2 ALTERNATIVE MODELS FOR PROVIDING RECORDS MAINTENANCE AND UPDATES

In addition to the model shown in Figure 2, ILRG considered and rejected two alternative models to meet the needs for land administration services by communities to keep their land rights documentation (and other resource data) up to date. Below we briefly describe the options and why we rejected each.

3.2.1 COMMUNITY BY COMMUNITY SYSTEMS

In this alternative, each community organization or customary authority would establish its own system locally. ILRG does not recommend this approach because it is not cost-effective for the level of demand in most communities, it requires substantially more up-front investment, and it is unlikely that public or private financing would be available at scale. It would be more difficult to standardize data for harmonization with state land administration systems and, in ILRG's experience, most communities do not have sufficient human and technological capacity to implement and operate land administration systems. One key lesson learned from TGCC in Zambia and the work of CaVaTeCo in Mozambique is that digital data **cannot generally be managed locally**, as there is simply not the capacity available to do this through solutions relying on technological innovations and the maintenance of digital databases. This is not surprising and is similar to lessons learned from local/municipal level government experiences in Madagascar and Benin under the Millennium Challenge Corporation (MCC). In these places, it was

found that digital services for land administration are not viable in every rural local jurisdiction.⁵ What is proposed in this concept note is in response to demand and will build on pilot land rights documentation projects that were done with strong community buy-in. The model ILRG proposes is being designed with the need to be both low cost and of value to communities as a starting point.

3.2.2 MIGRATION OF COMMUNITY LAND RECORDS INTO NATIONAL LAS

Working on top of existing government systems would be ideal for ILRG, if either Zambia or Mozambique had a legal basis and practical interest in pursuing this option in the near term. In Zambia, customary land administration lies outside the mandate of the state, and any effort to bring it into the formal system would be met with significant political resistance for the foreseeable future. Chiefs are very interested in tools that support their ability to manage customary land, but cannot, at present, expect that the government will invest resources. In Mozambique, the current system, while recognizing community rights, is largely inaccessible to both communities and households, and has the potential to make households more vulnerable to losing their land through market pressures. ILRG will ensure harmonization with state rules and processes, where it makes sense. If the practical, political, and legal environments open in the future, ILRG will be ready, but for now the program cannot wait for a state-led process to guide community rights administration and, more importantly, to sustain results already achieved in first documentation.

Presently, then, it is not tenable in either Mozambique or Zambia for the national LAS to take responsibility for community data. This reflects both socio-political and technical constraints. In Zambia, customary land is seen as completely independent of the Ministry of Lands and Natural Resource (MLNR) and under the management authority of chiefs, who will not allow MLNR to administer their customary data. Additionally, there are a broad range of administrative and technical issues to be resolved, which include agreement from MLNR to host customary data, additional configuration of the national registration system to lodge registrations against customary land, and harmonization of data models in source and target systems to migrate the data. In Mozambique, the current development plan for the SiGIT, combined with regulatory and administrative constraints, presents overwhelmingly burdensome opportunity costs to users, which will effectively prevent it from becoming an operational system with up-to-date land data.⁶ Furthermore, there are constraints that relate to the way prior MAST approaches were undertaken that limit the option to immediately sustain results by migrating records into national systems, even if the context was ready for that. There is a gap between SiGIT and ZILMIS and various crowd-sourcing systems with collected customary information. As MAST activities advance in Zambia and Mozambique, harmonization with national frameworks is an active element of work. In the short term, ILRG will promote national information systems being able to see (and place on public portals) records of customary land parcels, as has already been done with the National Spatial Data Infrastructure (NSDI) in Zambia.

There are also limitations with information in the crowd-sourcing systems that were used under the previous USAID activities in Zambia and Mozambique, in that even where information is complete, it does not meet Land Administration Domain Model (LADM)⁷ standards and lacks grounding for legal registration or sustainable customary administration. These include the following:

⁵ Teyssier, n.d.

⁶ The recent (Nov 2018) amendments to the Code for the Real Property Register are a case in point; these now make mandatory the legal registration of all DUAT titles, at a cost of USD \$80/title, and any subsequent amendments to these.

⁷ LADM is the International Organization for Standardization 19152:2012, Geographic information -- Land Administration Domain Model (LADM) and is comprised of four basic entities: (1) Basic Administrative Unit (LA_BAUnit), (2) Right, Restriction or Responsibility (LA_RRR), (3) Party (LA_Party), and (4) Spatial Unit (LA_SpatialUnit).

- Limited maintenance procedures – information is a still photograph and is getting obsolete very quickly since the processes for registration of subsequent transactions are not widely understood or tested. Despite this, local partners in Zambia and Mozambique are seeing a substantial demand for updates to certificates and for extension of existing work, based on direct requests from chiefs and districts for assistance with land documentation processes. TGCC and ILRG partners have supported alliances in three additional districts to follow certification processes, and local chiefs and the House of Chiefs frequently ask ILRG for assistance in extending the documentation process;
- Limited visibility – information has largely been invisible for interested stakeholders. Despite efforts of USAID programs to develop platforms for visibility, it is unclear whether local stakeholders are using the platforms effectively. This is due to limited recognition of the importance of long-term administration of the data, and a lack of a culture of using spatial data for decision-making;
- No provision of legal extract from this “customary” registry; and
- Not ready for integration or communication with a national system – customary data and state land data can be quite different data models. ZILMIS is not yet ready to handle even state land data consistently or effectively and so could not be relied upon to host customary data effectively. The data model for SiGIT has only recently been provided to the Government of Mozambique by the software vendor, making harmonization impossible until now. CaVaTeCo data fields and the schema are in conformity with SiGIT but there is no facility yet for the bulk upload of digital data into the system. A portal for this is currently being designed by the DINAT.

The above considerations favor a community land administration approach for non-governmental provision of land administration services that cater to the needs of customary and community systems and accompany expanding community-based land documentation initiatives. This approach allows the key elements of each customary systems to be translated into workflows and programs that can be tested using accessible, low-cost modern technology to connect community land management processes with a shared maintenance database. With appropriate training and resources, the expectation is that village and community land managers can use this technology to record and register the customarily-acquired land rights of millions of smallholder and family farmers and rural communities by posting to and interacting with a records storage database. It is likely that there could be particular types of transactions or particular locations that will be best served by the community land administration host organization or service providers sending an agent to input the information into the database or support access to the maintenance database.

In addition, the community land administration approach will establish and test a platform that will be seen as legitimate by customary and local authorities, since it comprises data generated by them, and also could make community land information available for use by multiple end users like investors who want to make responsible investments. Finally, for Mozambique and Zambia, there is an opportunity to build a common core technology architecture and tool suite, for use across communities and also across the two countries, with flexibility to accommodate variations in context (if Tenure Facility investments do not fully materialize). ILRG believes that the approach and technology will be applicable in other places that share similar-enough policy and legal frameworks and similar-enough patterns in changing land rights over time.

4.0 COMMUNITY LAND ADMINISTRATION DESIGN: ACTORS AND BEHAVIORAL CONSIDERATIONS

4.1 COMMUNITY-LEVEL BEHAVIORAL CONSIDERATIONS

An essential task in the design of a community land administration system (and for implementing projects that support implementation of the conceptual model shown in Figure 2) is to examine and determine the roles, relationships, and systems of communication among community members and community organization structures that generate and validate the information supplied to the main database (land authorities) and between the community organization structures and those who operate the database and provide essential technical support (host or service provider). This examination is best done in relation to a typology of changes to land rights that require or benefit from updating certificates. ILRG developed a methodology for assessing such behavioral norms and applied it in a rapid appraisal in several communities in Mozambique and through discussions with four traditional leaders and visits to customary communities in the Eastern Province of Zambia. The methodology for assessment is presented in Annex 1 and the findings are summarized in Annexes 2 and 3.

Annex 1 includes a comprehensive table (Table 6) of types of changes that could be registered and would likely be used for a state land administration system workflow design. However, it was determined that a simplified version was more suitable for the rapid appraisals carried out in Mozambique and Zambia. The simplified version initially examined the following actions:

- The validation and legitimizing of new rights/changes in rights;
- Land transaction processes with third parties;
- Land transfers within family groups;
- Ceding of use rights (leasing and rentals);
- Management of commons (with reference to community land use plans (LUPs) developed through the delimitation process) and rights of way (presented in the community meetings in terms of access to water); and
- Other changes driven by factors outside control of the community.

The original transactions matrix was tested and discussed in Ile District in Mozambique and shown to be sufficient for capturing experiences in in Zambia's Chipata and Petauke Districts. The simplified format is used in Tables 1 and 2 below to illustrate behavioral findings and underline the need to adopt a simplified, consolidated list of transactions for designing appropriate workflows for community land administration. Even if statutory law or customary law recognizes the broader array of changes, using the shorter list is consistent with the underlying assumptions that have led to the concept of community land administration and how to develop it in practice.

The simplification of the list of transactions reflects the observation that in a system that recognizes the validity of customary law and practice and allows specific jurisdictions to regulate internal affairs

following their own norms and practices, it is not in fact necessary to codify everything.⁸ This is the case in both Mozambique and Zambia. In the Mozambican policy and legal framework, for example, two key elements stand out: first, the constitutional principle of legal pluralism which recognizes and establishes the full legal validity and equivalence of all the different normative legal systems that exist in the country and second, the way in which the device of the local community created in the 1997 Land Law works together with the provision in the law that DUATs are acquired by occupation according to customary norms and practices. Zambian law can be interpreted in the same way that upholds the rights of communities and local landholders (as long as these align with the wishes of the customary leadership), but the common perspective is that customary land rights are weaker than leaseholds on state land. Indeed, the ability of customary leaders, often in coordination with investors or government, to make decisions that do not align with local communities/landholders wishes is one of the main weaknesses of the Zambian framework. However, a community-based land documentation and related land administration services will reduce this opportunity for arbitrary decisions by traditional leaders and others by creating evidence of existing occupation.

In the development of a community-based land documentation and administration system, how the person requesting the registration and certification acquired this right (through inheritance, sale, gift, etc.) is not of direct concern. What is important is whether the right has been approved and legitimized by the recognized community authority, or, in the case of “internal processes” at the level of extended families and households, whether local norms and practices regarding inheritance and other intra-household land decisions have been applied in accordance with prevailing norms and practices. If there are problems, and people challenge what is happening, then once again the legitimization and validation of a final decision provided by the higher-level authority is necessary and sufficient for the process to pass to the community cadaster.

There are also instances where even the traditional leader is not needed. For example, in Mozambique, inheritance processes taking place within extended families, where local norms and practices are well-known and respected, may not require validation or approval from the *regulo* (community-level traditional leaders), as shown in Table 1, and it is not necessary even to go to the community association and request a new certificate unless the parties involved want to do this. When it comes to considering whether a person who wants to register their land or changes to their land rights should be able to do so, all that matters is that the right held or claimed by that person is proven to be legitimate and free of conflict in the local context.

Moreover, in the case of ceding use (rentals), the empirical testing in Mozambique and Zambia suggests that this kind of arrangement does not need any kind of formalized process and related documentation. Even in the formal context, only rental agreements which extend over long periods of time may be formally registered and attached to formal DUAT title documents and certificates in the property registry, but this is rarely, if ever, done.

This does not mean, however, that land users should not be encouraged to register the land rights and changes to them with the community organization through the community land administration system and update their certification; the sustainability and relevance of the community-based land documentation are enhanced with more complete coverage across the community. When they do, however, care must be taken not to add new barriers or approvals that were not previously present. In some contexts, acknowledgement of a change is sufficient; in other cases, approval of a transfer of rights is required at the level of community structures, but no higher. For example, in Zambézia Province in

⁸ Avoiding the need to do this was in fact a specific objective of the set of instruments built around the local community as a kind of interface between the external normative system and what happens inside each community. Codifying customary law is not just a huge undertaking, it also runs the risk of removing its essential flexibility and multifaceted character with respect to a range of rights that are difficult to capture in a western-style cadaster.

Mozambique, *acknowledgement* is required (though not always) when someone wants to transfer land to another person from the same community, whereas *approval* is required when the transferee is from outside the community.

Acknowledgement and/or approval can be provided for in the relevant work flows. However, the bottom line is that it is not necessary to develop precise and detailed work flows for every kind of land transaction, but it is necessary to have clear points in the workflow to record and confirm the acknowledgement and validation of processes by local customary land managers. This includes confirming the absence of dispute or the resolution of disputes where these are known to have occurred. A workflow that begins with a query regarding the kind and source of the transaction would therefore appear to be sufficient in this context, followed by appropriate boxes to check and confirm the absence of dispute and the confirmation of the process by the local customary land administrator (leader/chief, etc.).

The rest of the workflow involves confirming the steps taken by the newly empowered community land structure (a community association or equivalent) to move ahead and proceed with activities that currently have no place or equivalent in the customary context (surveying and recording changes in land rights and registering these with the database where the community-managed cadaster is maintained). The processes developed by CaVaTeCo to map land rights and then issue certificates offer a good model in this respect.

As described, validation is essential when changes in land rights are taking place. The role of the land chief or traditional leader is therefore an essential component in the process of keeping land databases up to date. In Mozambique, for example, only in cases where inheritances and other internal transactions may have potential for dispute or where the parties feel that validation is needed is the traditional *régulo* called in and the process above (workflow) put into action. The need for validation in all of these situations can be built into appropriate workflows that can then be used when investigating these processes in different countries and cultural contexts.

The objective of understanding the above and the behaviors captured in the tables is to obtain information on local land management processes that can be translated into steps that can then be laid out as a series of yes/no and simple drop-down menu responses for the community land administration workflow engine, similar to those that have been used to conduct the process of parcel mapping and delivery of certificates to land holders. To encourage the registration of changes, accessibility and costs matter here just as they do with the large land tenure regularization (LTR) programs which are now struggling with the same question of keeping their records up to date. The focus throughout should be on simplicity and being able to obtain information on the outcome of quite complex processes, by identifying the key elements that are common to all of them and the key moments when validation of specific steps is necessary. These points can then be included in the workflow steps, which can be translated into simple software solutions to record, confirm and then register the transactions that have taken place.

Based on the assessment of behaviors in Mozambique (see Annex 2 for the questions asked and responses, which are only briefly touched on above), the business processes suggested as most relevant from the community perspective are:

- Transaction with third parties;
- Transaction through internal “family” processes (inheritance, land gift, etc.); and
- Rental or other ceding of use.

Also reflecting the discussion above, in all of these cases, two basic questions arise that should be the subject of appropriate workflow designs:

- 1) Is it necessary to validate and legitimize the process (YES/NO)?
 - If YES, have the following steps been carried out:
 - Contract between parties exists and witnessed?
 - Contract explained to and approved by *régulo* (T)?⁹
 - Declaration of *régulo* (T) produced and signed by him/her?
 - Relevant payment been made to the *régulo* (T)?
 - (Is there a receipt confirming this payment?)
- 2) Is it necessary to record the process with the community association and get a certificate? (YES/NO)
 - If YES:
 - Is validation by the *régulo* (T) necessary?
 - If yes, is there a declaration signed by him/her?
 - The declaration then serves as basis for subsequent cadastral process and certification
 - If NO:
 - Is there some form of contract or agreement between the parties involved?
 - Is this contract and/or agreement is validated by the community association?
 - Community association advances to cadastral process and certification
 - At this point the current procedures already in the project tablets for issuing certificates kicks in, including the taking of photographs etc. when the new certificates are handed over.

Based on the behavioral assessment for Zambia (see Annex 3 for the questions asked and responses with are only briefly touched on above), the workflows suggested as most relevant from the community perspective are:

- Transactions requiring spatial changes;
- Transaction between third parties;
- Transaction through internal processes (inheritance, land gift etc.); and
- Searches/new prints

Similar to Mozambique, in all cases, basic questions arise that should be the subject of appropriate workflow charts:

⁹ *Régulo* (T) is the traditional *régulo*; *régulo* (P) is the politically-endorsed “community authority”

I) Is a new certificate required (YES/NO), because:

- a. It is necessary to validate and legitimize the process from the chiefdom customary level (YES/NO); or
 - b. Are specialized skills required to be mobilized to provide the result (YES/NO).
- If YES, have the following steps been carried out:
 - Has the individual/institution been registered?
 - Have the arrangements been approved from the chiefdom, area, headperson, and household level?
 - Has the host or service provider on spatial work been mobilized?
 - Is the justification for a new certificate or need for search records clear?

Once these conditions are met, certificates can be developed, printed, and updated at the same time, and presented for distribution.

- If NO:
 - Household level document the changes with the headperson/community/association consent and signature.
 - Headperson/community/association records details in the community/area level book.
 - Service provider periodically comes to the community/area level book to update the digital records.
 - If household chooses to update/print new certificate, they can move to YES, above.

TABLE 1: SIMPLIFIED TRANSACTIONS LIST AND KEY ACTORS/ACTIVITIES FOR MOZAMBIQUE

PROCESS	KEY ACTORS	ROLES/ RESPONSIBILITIES	SUPPORTING DOCUMENTATION AND OTHER EVIDENCE	HOW RECOGNIZED? (OBJECT, ACTION, CERERMONY, ETC.)	COST FLOWS
Validation of land transaction when required (legitimacy)	Régulo (T) 2 nd and 3 rd level Régulos (T)	Régulo: Check details; confirm within norms and practices	Contract negotiated and agreed between parties Contract witnessed by neighbors and/or others	Declaration by Régulo with “stamp” Meal for the participants	Small cash sum to régulo T (MZN 50 – 300) Meal supplied by parties to the transaction: chicken and drinks (not a payment)
Transactions between third parties (sale of land or subdivision and sale)	Régulos Community association structures	Régulos: validate the transaction (as per line 1) Association: Confirm Régulo validation; confirm and map borders working with interested parties; issue certificate	Régulo declaration (validation) Contract between the parties		Percentage of value of sale etc. paid to the “land administrators (association) (Field meetings suggested 10 percent, though this is high) Percentage payment divided between régulo T and the association (not the president of the association) – field visit indicated 50/50 split
“Internal transactions” (principally inheritance)	Household heads Eldest son Uncle (witness)	Household heads: indicate land to be inherited (to 1 st son) Eldest son: informs family of inheritance wishes (on death of father)	Uncle acts as witness and confirms what eldest son is saying		No costs unless the association is involved and issues a certificate
Management of commons and rights of way to key resources	Régulos and other leaders	Participate in community LUP	Community and focus group meetings	Community LUP developed and agreed	
Other activities <i>Taking land out of local control (desmembramento in Mozambique)</i>	Régulo and other leaders Public land administration	Régulo and leaders: consider and approve request Public land administration: carries out formal titling process	Declaration from régulo		Small payment to the régulo

TABLE 2: SIMPLIFIED TRANSACTIONS LIST AND KEY ACTORS/ACTIVITIES FOR ZAMBIA

PROCESS	KEY ACTORS	ROLES/ RESPONSIBILITIES	SUPPORTING DOCUMENTATION AND OTHER EVIDENCE	HOW RECOGNIZED? (OBJECT, ACTION, CEREMONY, ETC.)	GENDER ISSUES	COST FLOWS
Validation of land transaction when required (legitimacy)	Headperson Area Advisor (induna, land committee, village action group) Chief/Chief's Council	Acknowledge in cases where actions are internal; Approve in cases where there are external actors	Witness and/or community decision historically Recording in village register or chiefdom register, as necessary Documentation by chief through letter, as necessary	Documentation through a letter May require the production of a new certificate	General cultural issues are likely to limit engagement of women in these processes, except through their existing roles.	Token payment of sugar, oil, chicken, goat, etc. provided to chief Additional payment required to cover costs of the printing, movement, or validation
Transactions between third parties (sale of land or subdivision and sale)	Buyer/Seller Headperson Area Advisor (Induna, Land Committee, Village Action Group) Chief / Chief's Council	Approve person and general right to occupy Document land right change Document constraints/ limitations Issue certificate	Individual housed within village/ chiefdom register Contract of arrangements limitations Certificate	Documentation through a letter Requires the production of a new certificate	Open questions are related to approvals as joint landholders, do both sets of landholders need to approve?	As above payments, though costs may be higher given external individual capacity to pay
"Internal transactions" (principally inheritance)	Households Headperson Area Advisor	Document addition of new persons of interests, or changes to the certificate in an addendum	Documentation within household, certified by headperson, on certificate addendum and in village register	Document declaration Village register (paper) is updated annually into digital records by area committee No certificate generated	In these cases, provisions around protection of spouses, and procedures in the case of divorce need to be codified/clarified	No costs, unless new certificate is generated, which will be done when all existing landholders on a certificate pass on
Ceding use and other forms of rental	Between two separate households/actors	No formal documentation, unless action is with an outside	No documentation	No documentation	Key issues are associated with monetary transactions and	Not registered unless large-scale/commercial

PROCESS	KEY ACTORS	ROLES/ RESPONSIBILITIES	SUPPORTING DOCUMENTATION AND OTHER EVIDENCE	HOW RECOGNIZED? (OBJECT, ACTION, CEREMONY, ETC.)	GENDER ISSUES	COST FLOWS
		large-scale/ commercial actor			decision-making but won't be captured in a local cadaster	
Management of commons and rights of way to key resources	Headperson	Protect rights of overlapping resources	Village or area land committee meetings	Codified in village LUP	Primarily an issue of integration of women in development of LUP	Not applicable
Conversion to state land	Household Headperson Chief Local Council Ministry of Lands	Follow MLNR prescribed process	Letter of consent from chief Local site plan		As above, concept of joint titling and opportunities for objections need to be examined. Assumption that most of these conversions will be associated with outsiders	Costs associated with MLNR processes

4.2 COMMUNITY LAND ADMINISTRATION ORGANIZATIONAL HOSTING OPTIONS

The types of roles for a host organization between people and technology include stewarding the maintenance database and portal; stewarding the workflow engine and communications tools for adding or modifying records in the database and producing new certificates; and setting standards for data collection and providing guidance, training, and technical assistance (and potentially equipment) to other organizations supporting community-based documentation processes and/or the customary and community organizations undertaking these. The list of roles will need to be specified in more detail and will vary from context to context. To be effective, such an organization will need to be trustworthy and legitimate in the view of participating communities and have a light/small footprint and low-cost service provision model. It will also need to be able to attract ongoing donor support, impact investment or establish and collect appropriate fees for service to cover costs. The latter is best from a sustainability perspective over time; however, in the near term, some investment capital is needed.

Based on the three roles suggested above, the most appropriate option is to partner with an existing non-governmental organization (NGO) that has an aligned mission and functions. The CaVaTeCo report considers existing partner opportunities and concludes that the best approach is for Terra Firma and ORAM to establish a new lightweight, single-purpose social enterprise. Sustainability of such a venture will be always be a function of the user numbers, whether revenue is generated from user payments or through other potential revenue streams related to use of data by third parties. If costs can be kept low enough compared to revenues, then the venture could continue to provide community-centered land administration services as a stepping stone into the realm of fully titled rights held in the national LAS. If the costs can be kept low enough compared to revenues, then this social enterprise could continue to provide community-centered land administration services even if/when the national land administration system expands its reach. In Zambia, Medeem and several district land alliances (DLAs) were considered. None are ideal in terms of level of interest, alignment of approach, and capacity. Therefore, a suitable host organization has not been identified yet. In the near term, ILRG has and can perform these roles in conjunction with the DLAs that TGCC partnered with. This approach is not immediately sustainable in Zambia over the longer term. ILRG will continue to explore the question of who to and how to hand off these roles from ILRG, and will build the needed capacity while the proof of concept activity is being implemented.

5.0 PRELIMINARY DESIGN SCOPING FOR COMMUNITY LAND ADMINISTRATION TECHNOLOGY PLATFORM

This section describes the technologies involved in the community land administration ecosystem, introduces potential technology options based on what currently exists, and lays out a path forward to ensure sustainability of community land administration technologies following the close of ILRG. In order to arrive at appropriate technology, the report lays out the relevant technology-driven decision points to achieve a sustainable platform, many of which will need to be answered through more detailed design activities before determining the most appropriate software solutions for the technology components discussed below.

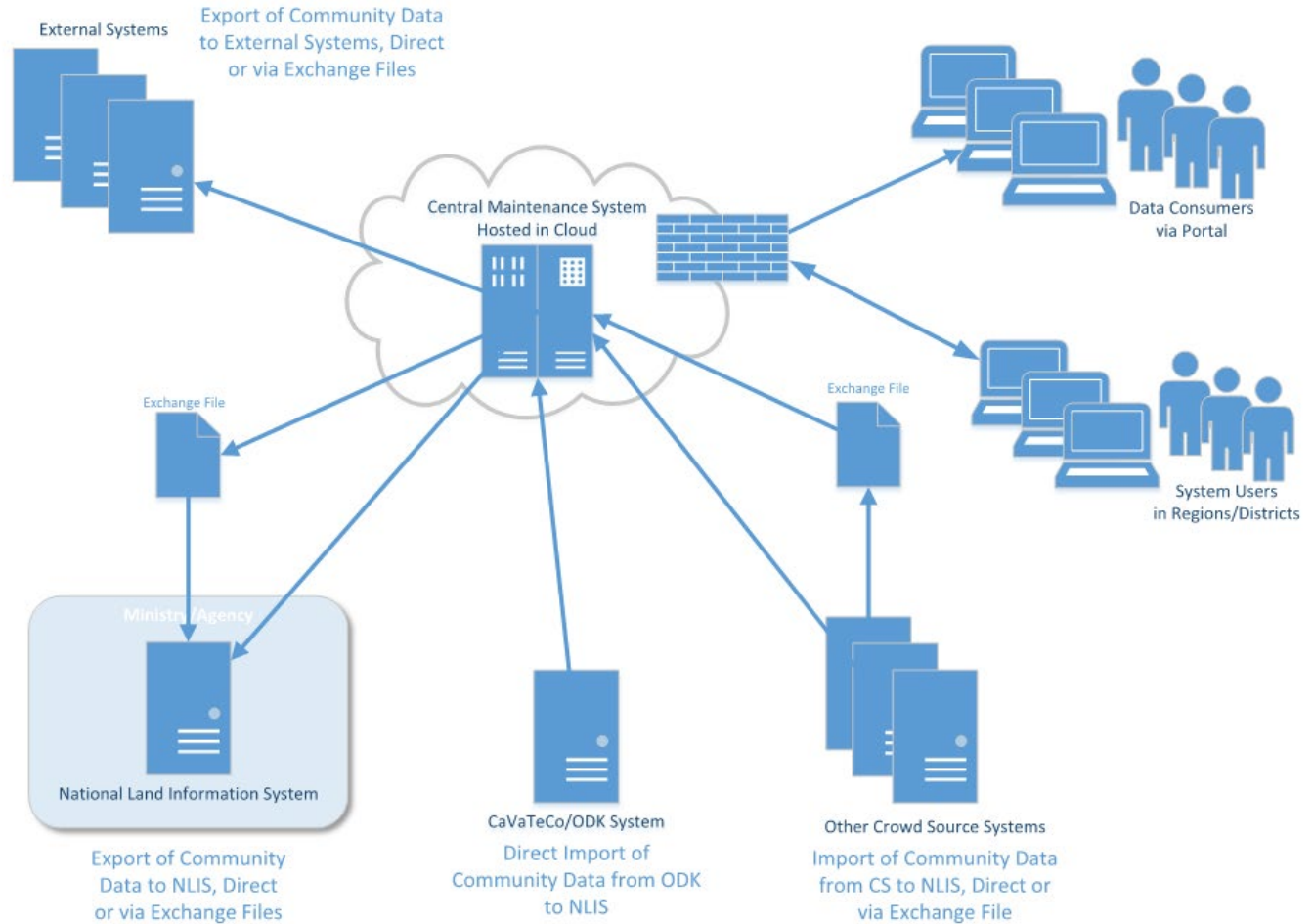
5.1 OVERVIEW

Technology is a key element of the community land administration ecosystem. The community land administration technology platform will be hosted by a national-level institution that has the technical skills and know-how to manage, maintain, and update community land administration technologies. At the field level, it is expected that local service providers will support community access to the platform. While some components of the platform already exist, activities undertaken by ILRG will ensure that the modular components of the platform are sustainable and based on relevant standards. Pilots in Zambia and Mozambique have focused on development and deployment of first documentation technologies. For the purposes of ILRG, efforts around first documentation technologies will focus on ensuring that the approach is replicable and based on relevant standards. ILRG's main new investment will be to establish components of the platform that allow rights data to be updated and maintained, moving beyond the current snapshot of rights as generated by first documentation activities. Community land administration rights data is envisioned to have a level of forward compatibility with state land administration systems, but, as discussed above, several factors make this beyond the scope of ILRG's control.

5.2 TECHNOLOGY PLATFORM DESIGN

The community land administration technology platform will be a trusted system capable of warehousing and managing changes to current and historic customary land rights data. The platform will provide access and transparency through a user portal. The core components of this platform, as shown in Figure 3 below, are first documentation technologies, a centralized rights database, a user portal, transaction request mechanisms, and workflow management. Data will integrate between these core components and other relevant systems. External to the community land administration platform, but part of the greater ecosystem, are external technology platforms such as state LASs and national and global spatial databases, both proprietary and open source. The relative roles and functionalities of each of these components are described below.

Figure 3: Context of the Central Maintenance System



5.2.1 COMMUNITY LAND ADMINISTRATION TECHNOLOGY PLATFORM CHARACTERISTICS

All technology elements of the community land administration platform share the following characteristics:

- *Based on standards to ensure compatibility.* Data, as collected under previous efforts, was not fully compliant with existing standards. To ensure that customary rights data is as compatible as possible with external platforms, first registration data models will be adjusted to allow data sharing between community land administration, and relevant standards and platforms such as LADM, Open Street Map (OSM), and state LASs. At the same time ILRG is working with government to relax standards that make it prohibitively difficult to register land, as well as developing standards where necessary. Within Zambia, despite periodic requests over seven years, ILRG has not been able to acquire the data model for the national land information system.
- *Security and accessibility ensure legitimacy and reliability.* As a trusted platform that sits outside of government systems, the community land administration platform will be both secure and accessible. Security features ensure that communities have control over their own data and

cannot alter data from other communities. Appropriate permissions govern any changes to data and data is held securely following current best practices on responsible data with attention to protecting personally identifiable information. Conversely, the platform also provides access and transparency that allows public officials and rights holders to view and, as appropriate, make changes to data on customary land rights. Through engagement at the field level by a competent technical service provider, and at a national level by a host organization, the platform will be scalable, reliably available, and archived as appropriate.

- *Flexible customization.* The platform is both flexible and simple enough for local administrators to manage it in Zambia and Mozambique, as well as other similar country contexts. To ensure flexibility, selected technologies must be modern, web-based, and cloud ready. The platform is modular and component based, with modules designed to reuse and deploy (i.e., designed for adaptability with country-specific values not hardcoded).

5.2.2 KEY TECHNOLOGY COMPONENTS

5.2.2.1 FIRST REGISTRATION

First registration technologies in both Zambia and Mozambique were developed and tested during previous pilots. Lessons learned from these activities note that there are many mobile data collection technology platforms available and that the key to success of these tools is a data model that allows for compatibility and interoperability.

First registration technologies utilize mobile data collection tools that leverage smartphones or tablets paired with a Bluetooth global positioning system (GPS) receiver. In Zambia and Mozambique, Open Data Kit (ODK) is the core open source software for data collection, which allows for bulk collection of data on customary land. Data entry forms help to automate a multi-phase approach by which alpha-numeric and geographic data are collected. ILRG distinguishes data generated from first registration as rights data (i.e., parcel, certificate, holder), resource data (i.e., land use, community boundary, water points, schools, health clinics), or process data (i.e. information on witnesses, meetings, consent, etc.).

Previous studies have been conducted to compare mobile data collection solutions and ILRG recommends ensuring that the data model used in Zambia and Mozambique is based on standards to ensure that data can be readily exchanged with existing platforms or migrated into formal data schemas such as LADM. ILRG has made incremental improvements to the data collection tools used for first documentation fieldwork to ensure that data collected is compatible with standards such as LADM and to allow data sharing with external systems such as OSM, and Zambia's NSDI.

5.2.2.2 CENTRALIZED RIGHTS DATABASE

One of the core technology components to the community land administration technology platform is the centralized rights database. This database is a warehouse for customary rights data that also allows for updates and changes to registration information. As a process-focused database, it tracks systematic documentation of rights from the issuance of certificates through the different workflows described in Section 4. The database maintains maps and records of existing rights over a defined territory, with sufficient detail to clearly identify boundaries between land parcels. It also provides for updated maps and records as land rights change through sale, exchange, marriage, inheritance, subdivision, etc. As envisioned in the community land administration ecosystem, communities will hold the analog version of data and relevant documentation stored in the centralized rights database. It is important to note that resource data (i.e., land use, water point, community boundary) is not housed in this database. The data schema of this database is based on LADM. In keeping with best practices for responsible data, this database will also house consent agreements from communities and individuals.

The central rights database and other technology elements should be hosted with maximum availability for all stakeholders and users who will work with the platform. There are several options for hosting, which are compared in Table 3.

TABLE 3: CENTRAL RIGHTS DATABASE HOSTING OPTIONS

OPTION	PROS	CONS
Amazon Web Services, Google Cloud, Microsoft Azure, ... ¹⁰	<ul style="list-style-type: none"> • Auto backups • Available 24/7 • Part of system administration is provided by hosting platform • Subscription costs based on performance and/or data volume • Scalable as number of transactions and volume increase 	<ul style="list-style-type: none"> • Legislation in some countries restricting the offshoring of cadastral data • Accessible by local institutions only via internet
In-country hosting (physical server)	<ul style="list-style-type: none"> • Auto backups • Available 24/7 • Part of system administration is provided by hosting platform 	<ul style="list-style-type: none"> • Cost? Requires additional analysis but initial enquiries reveal high costs • Security? Requires additional analysis
Hosting on premises (local network/server)	<ul style="list-style-type: none"> • Locally accessible even if internet is down 	<ul style="list-style-type: none"> • Costs difficult to predict as usage increases • Requires hardware/software investment and maintenance • Requires reliable internet and electricity connection • Requires qualified personnel to administer • Requires consideration of physical security

5.2.2.3 USER PORTAL

As a trusted and reliable source, the community land administration technology platform will be accessible and transparent to users through an online portal. The portal will allow users to browse alphanumeric data, maps, and digital documents. Communities and customary authorities are the primary owners of the data housed and they will be able to access community information through the portal. Appropriate permissions will be built into the platform so that communities may not edit data for other communities and so that personally identifiable information is securely stored. Additional users such as public officials, banks and financial institutions, and potential investors (with consent) will also be able to view customary land information.

5.2.2.4 USER, WORKFLOW, AND REPORTING MANAGEMENT

To effectively manage first registration and subsequent changes to customary land rights data, the technology platform requires user, workflow, and reporting management through what software developers call an “engine,” which allows for simpler customization and scaling. The workflow engine facilitates the technology aspects of the behavioral and business processes described in Table 6 in Annex I and ensures that the correct users are assigned appropriate tasks in a logical order as defined by

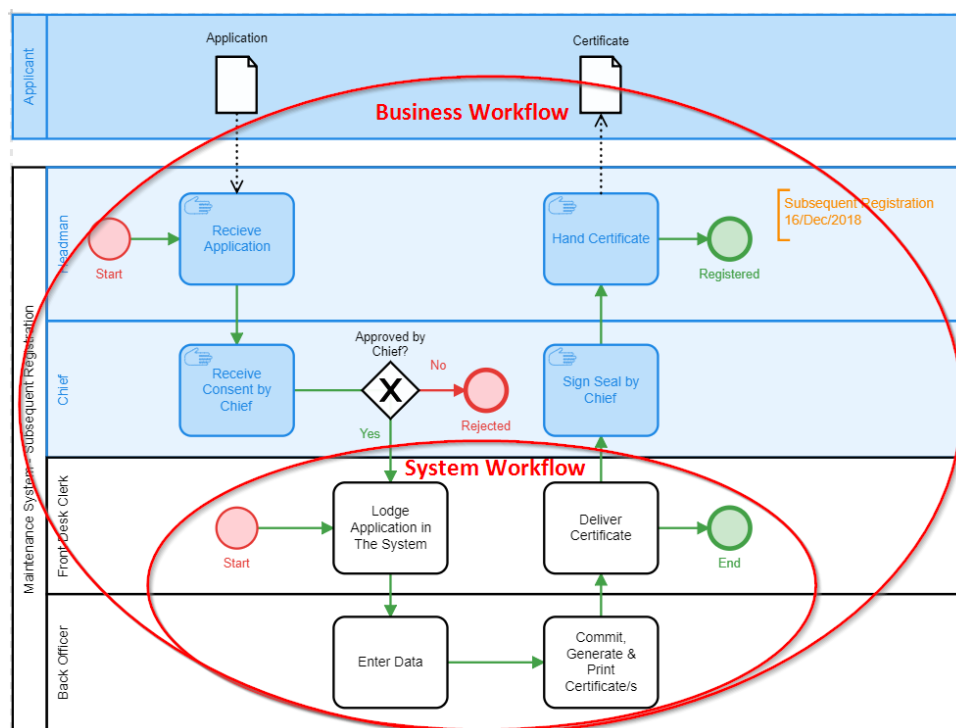
¹⁰ <https://www.softwaretestinghelp.com/cloud-computing-service-providers/>

business processes. Workflows as currently envisioned are depicted in Annex 4. The workflow engine allows for flexible configuration of transactions and business rules.

The community land administration technology platform also requires a reporting engine and flexible, role-based user management. Reports allow users to check the status of data within the platform (i.e., number of certificates issued, number revised, etc.) and provide templates for certificates and other documentation. Permissioned user management allows different roles to be defined based on level of access and need (i.e., administrator, permissions to edit spatial data, permissions to update names on certificates, etc.).

It is important to distinguish between business processes and system workflows (see Figure 4) where business processes are the human tasks performed manually outside of the platform and system workflows are actions taken through electronic software. This report does not include consideration of workflows for first documentation activities as these are not new to ILRG.

Figure 4: Business Process and System Workflow



First documentation of land rights and the six main types of subsequent transactions will each have a unique business process and related system workflow. In relation to the technology platform, our analysis suggests system workflows that are sufficient to capture data across these transactions. These include the following (see Annex 4 for more detail):

1. First registration and parcel mutation workflow – for first registration of the certificate with field visits and for subdivision/consolidation with issuing new certificate/s (spatial changes);
2. Subsequent registration workflow (in case of transaction with third parties or internal/family transfers);
3. Cancellation of certificate workflow;
4. Search workflow;

5. Data correction workflow; and
6. Lost certificate workflow.

5.2.2.5 TRANSACTION REQUEST MECHANISMS

In addition to first registration for data entry and collection, the technology platform requires mechanisms by which authorized users channel information and requests to the centralized rights database. Further design work is necessary to determine appropriate technologies to support requests as some of these business processes may be most efficient using manual, paper-based approaches. In Zambia, previous pilot work utilized SMS-based platforms to track transaction requests. ILRG initially explored the feasibility of equipping customary authorities or other appropriate intermediaries with feature phones to submit SMS requests for changes to customary land rights data, building on the strengths and limitations found during previous efforts. However, paper-based forms and smartphones are ultimately most viable.

5.2.2.6 DATA EXCHANGE AND INTEROPERABILITY

In order for the technology platform to provide effective and efficient services, components of the platform must be interoperable and allow rapid data exchange between first rights registration systems as well as other platforms, to ensure data collected during business processes to have the greatest value and impact for users and stakeholders.

External platforms for data include both government systems as well as public platforms such as OSM. SiGIT in Mozambique and ZILMIS in Zambia do not currently host community/customary land data and do not maintain these records. As discussed above, several factors make interoperability of systems difficult. However, the centralized rights database should provide the functionality for migration of customary records into the national system, primarily through ensuring that the data schemas match those of the state system where applicable.

First documentation data collection activities generate data beyond what is needed for a centralized rights database and include data that is relevant for other functions such as land use planning. In order to increase visibility of community resources and ensure that data collected during first registration is effectively utilized by relevant stakeholders, select resource data should be compatible with external platforms such as OSM. OSM has nearly 1,000 data tags that are designed to let users accurately describe buildings, features, and areas. Many of these data tags mirror geographic features, such as schools and water points, that are collected as resource data during first documentation. ILRG will test migrating relevant resource data to OSM, which will help to ensure that community resources are broadly recognized on a crowd-sourced platform. In addition, ILRG will work with relevant ministries, such as those responsible for education, to ensure that relevant data collected during first registration, such as school locations, is accounted for in ministry planning.

Data exchange amongst technology platform components and between the platform and external platforms can be achieved through two mechanisms—either via open application programming interface (API) for direct system-to-system data migration or via data exchange file (a standardized file exported from one and imported into the other).

5.3 TECHNOLOGY OPTIONS AND DECISION CONSIDERATIONS

Using the broad strokes of technology functionalities and requirements described above as a framework for evaluation, ILRG conducted a rapid review of technology solutions that manage customary rights data to see how current options available in the market align with defined needs. Table 4 below summarizes the main capabilities, which are discussed below. ILRG's analysis found that no product

currently available on the market fully fits the community land administration need, but, following further design activities, some could serve as starting points for development.

TABLE 4: COMPARISON OF TECHNOLOGY PLATFORM OPTIONS

FIRST REGISTRATION								
Mobile data collection	X	X	X	X	X	X	X	X
LADM compliant			X		X	X	X	X
CHANGE MANAGEMENT/MAINTENANCE								
Certificate production				X	X	X	X	X
Support for subsequent changes				X	X		X	X
User roles and permissions		X		X	X	X	X	X
Workflow engine		X				X	X	X
Data exchange/API		X		X	X	X	X	X
Flexible configuration		X		X	X	X	X	X
PORTAL								
Dashboard/data visualization		X		X	X	X	X	X
Permissioned access		X		X	X	X	X	X

5.3.1 DECISION CONSIDERATIONS

The technology platform should be sustainable, ensuring that the software components can be used, maintained, and updated beyond the life of donor funding. Frameworks are emerging from the information and communications technology for development space to evaluate technology platforms for sustainability. These frameworks, guided by the Principles for Digital Development,¹¹ ensure that technology platforms are developed with a holistic understanding of costs to design, develop, deploy, and update platforms well beyond the end of donor funds. Chief among these considerations is ensuring that a technology platform is responding to real user-identified needs and that planning accounts for costs beyond software. Open source software, while free from upfront licensing costs, is not free in the long term, as costs for maintenance and upgrades cannot be ignored. In order to make a software selection that sets the host organizations and service providers on a path toward sustainability, ILRG proposes conducting a total cost of ownership (TCO) analysis throughout the life of the project. Annex 5 includes cost considerations to be included in a robust TCO analysis. In addition, rather than selecting a set of software at this point, ILRG recommends undertaking additional, user-centered design activities to ensure that the technology platform meets needs as identified by the people who will be using and managing the data and technology.

¹¹ <https://digitalprinciples.org/>

5.3.2 DISCUSSION

None of the technology platforms in their current state fit the requirements identified for the technology platform. However, some of the technology options are potentially viable starting points for investment. Table 5 provides a breakdown of key considerations in utilizing each technology option as a starting point for technology platform investment.

TABLE 5: TECHNOLOGY OPTION CONSIDERATIONS

PLATFORM	CONSIDERATIONS	LIKELIHOOD OF USE
Open Tenure and Social Tenure Domain Model	<ul style="list-style-type: none"> + Built on open source components and developed by the Food and Agriculture Organization (FAO) of the United Nations and the Global Land Tools Network - Has never been deployed at large scale - Has not been under active development for a few years and lacks a community of practice to support upgrades and development 	Very low
Cadasta	<ul style="list-style-type: none"> + Global reach dedicated to mapping customary land and resource rights - Current version of software does not include land administration tools for changes and subsequent transactions + However, the platform now leverages Esri's suite of tools that could allow rapid deployment of workflow engine, permissioned user management and strong reporting tools <p>QUESTION: Would leveraging the Cadasta licensing model work for local service providers? Is this a cost-efficient way for local providers to access Esri's technology suite? To date there is limited evidence that users would be willing to pay Esri fees</p>	Good
Medeem	<ul style="list-style-type: none"> + Local Zambian organization with technical capabilities could serve as host organization - Suite of tools are proprietary and based on Esri's platform, which poses considerations for long-term licensing costs - Current suite of tools does not include land administration <p>QUESTION: Could Medeem leverage Cadasta licensing model? Medeem's lack of presence in Mozambique means that we are unlikely to be able to leverage across multiple countries</p>	More likely to be a service provider working off the system developed through ILRG
MAST Zambia	<ul style="list-style-type: none"> + Developed during pilot phase so there is strong local knowledge - Does not include land administration tools or workflow engine <p>QUESTION: Is it cost effective to build from existing MAST software? Or would starting new be more efficient?</p>	Good
MAST/Land Technology Solutions project	<ul style="list-style-type: none"> + Has a basic land administration tool - Would likely require continued and long-term investment in the platform by USAID 	Likely to learn from rather than build from
MAST/TRUST	<ul style="list-style-type: none"> + TRUST is a customized version of MAST that was developed by USAID for implementation in Tanzania and, to date, has been utilized to issue tens of thousands of certificates - Current software is built to be specific to Tanzania processes, which would make replication difficult + TRUST, unlike MAST Zambia, has a limited workflow engine <p>QUESTION: Is it cost effective to build from existing TRUST software? Or would starting new be more efficient?</p>	Good

PLATFORM	CONSIDERATIONS	
Esri	<ul style="list-style-type: none"> + Esri is the global leader in geospatial platforms and most geographic information system (GIS) professionals are trained on Esri tools + Esri's platform now leverages apps and workflow builders that have robust functionality and are readily customizable + Esri tools provide a scalable approach from simple map making to robust data management - Esri licensing is unnecessarily complicated and would be difficult for a local provider to navigate - Long-term licensing fees would make sustainability difficult <p>QUESTION: Depending on the type of organization selected as service provider, how do Esri licensing costs compare to other models?</p>	Low
Landfolio, Aumentum	<ul style="list-style-type: none"> + As enterprise land administration platforms, functionality is robust - Licensing costs are high and platforms are intended for government agencies 	Very low

As detailed in Tables 4 and 5, functionality considerations impact the viability of using different technology options for the technology platform. ILRG partially discarded solutions that do not have land administration capabilities or workflow engines, including Open Tenure and Medeem. On the other end of the spectrum, ILRG discarded products from Trimble and Thomson Reuters, which are primarily designed for well-resourced government agencies working on statutory land administration.

One of the major decision points moving forward with a technology platform will be to decide between a proprietary or open source software model. Esri is the main proprietary option available and has a robust and readily scalable suite of tools for land administration. Globally, Esri is the largest and most well-known provider of spatial technologies and their solutions are backed by a large team of developers. Esri products include functionality from mobile data collection to desktop and web-based interfaces, workflow managers, and complete APIs, which ease integration and extend core functionality. That being said, Esri licensing costs are complicated to navigate and tend to be high. Any selection of Esri solutions would need to take serious consideration of long-term costs into account. Given the past history of partner organizations in country, it is unlikely that they will be able to navigate the Esri structure.

Alternatively, open source software is often lauded for the lack of licensing fees. TRUST and MAST both utilize open source software components and are royalty-free. However, experience has demonstrated that open source software involves costs for customization and support. Without a well-established community of software developers, open source technologies can become costly to customize, maintain, and upgrade or require a high level of technical proficiency (or reliance on specialized consultants) to make changes to system functionality. Open source software options exist for many of the technology platform components, but integration between these components can be either costly or reliant upon specialized knowledge. In addition, TRUST extension and MAST Zambia/Mozambique both have architecture that is hard coded, meaning that changes could be time-consuming and require a specialized consultant for adapting to Zambia and Mozambique requirements. These two platforms include country-specific concepts (i.e., hard-coded references to unique administrative structures) that would require modification by a Java developer to work. Whether or not this represents good value for money depends on requirements identified during design efforts.

A potential middle ground might exist with Cadasta, which utilizes Esri products, but at significantly reduced rates for licensing costs. As stated above, the Esri suite of tools provides a high level of functionality. With access to the full Esri suite of tools, Cadasta might be the logical choice for a host

organization. However, long-term licensing costs and sustainability still must be carefully considered, as it is not clear that Cadasta will be able to provide these services at a free or reduced rate indefinitely. Cadasta also does not have local presence in countries and as a result servicing and updating options are not entirely clear. Recommendations are presented below in Section 7.

6.0 SUSTAINABILITY OF COMMUNITY LAND ADMINISTRATION

A critical concern in developing the kind of system described in this report is sustainability. If the local database is not updated as changes take place, the certificates produced by it will rapidly become obsolete and lose any meaning. Keeping land records databases updated is already a problem for the large-scale titling programs that have been implemented in recent years in several countries.¹² It is also an issue for the community-based land rights documentation. In other words, LTR work of any kind must involve more than just a snapshot of local rights formalized through an initial systematic campaign of mapping and titling; once rights are located on a formal map and certified, the main challenge is to manage and record changes as land is sold, gifted, subdivided, and inherited.

As is clear in the introduction of this report, in both Zambia and Mozambique it only makes sense for ILRG to support further work on the large-scale documentation of community land rights if there is a clear structure and capacity for administering the data and actively using it to meet locally defined development objectives. When locally-generated, socially legitimate processes for managing change are identified and understood, workflows and software can be developed and used to generate socially and legally legitimate, useful, accessible, low-cost documents. These documents then continue to give local people full legal and administrative protection and facilitate their access to the resources and opportunities for genuine community-based rural development.

In that sense, ILRG is proposing to test and evolve a sustainability solution by introducing an affordable and accessible route to updating records as these types of changes happen. In other words, a major value of ILRG's proposed activity is to address sustainability of first documentation results by establishing land administration services that are accessible, easy to navigate, affordable, and useful for local people under community tenure systems. However, the sustainability of the proposed administration system (centralized services to record changes and maintain record archives) also needs to be ensured. This section provides some initial thinking about sustainability, but not a sustainability analysis or sustainability plan. That will require establishment of appropriate templates, such as those referred to in Section 5 above.

In general, it is imperative that the data is trusted and the land administration processes are transparent, accessible, simple, and affordable for local users. If they are not, then it is highly likely that local land users will stop using the system, and the new database will become obsolete and of little real use in the "extra-community" context of engaging with non-community actors and exercising land rights in pursuit of inclusive development options. The direct comparison in this context is the simplicity and ease of use of the various iterations of the MAST software used to record the processes of identifying people, taking photos, mapping parcels, and issuing certificates. New workflows should replicate this approach, while moving away from the simple mapping of existing occupation to developing workflows, reports and processes that can record and certify changes in occupation/changes in land parcels (through splitting up and sale, inheritance, etc.).

Another element key to sustainability is relevance of the services provided. People will only keep using the maintenance database and updating the information it holds about their land rights if it is useful to them. The community work during the behavioral assessment suggests that local people are beginning to realize and value the significance of what the cadaster provides. The cases of conflict that were observed (for example, where a woman had lost her land when her husband died; a man who realized that having

¹² For example, the Rwanda Land Tenure Reform Program and Second Level Land Certification in Ethiopia.

a certificate was now the “machete” he could use to defend his land against an incursion by a neighbor) underlined the importance attached to having a certificate to defend and uphold acquired land rights. These cases also underline the need to encourage local people to use the new community-managed cadaster to record and certify changes in land use and occupancy that result from internal as well as external (sale, etc.) transactions. It is therefore important to consider the wider policy and program context, which provides the credit and new economic opportunities that turn secure land rights into productive land rights.

One key lesson learned from TGCC and the work of CaVaTeCo and the Cadastro Popular (CP) in Mozambique is that data *cannot be managed locally within districts/provinces*; there is simply not the capacity available to do this through solutions relying on technological innovations and the maintenance of digital databases. This is underlined throughout the discussion above, with references to data being sent to and managed by a centralized data management system hosted nationally that is accessible locally by local service providers and community members themselves.

ILRG does not have sufficient information *ex ante* to prepare a detailed analysis of total cost of operating a system over time, because there are further design and service provision decisions to make. Rather, ILRG proposes to go forward with a proof of concept based on the preliminary assessment work reported on in this document. As part of the proof of concept activity, ILRG is committed to collecting data on cost drivers, revenue options, use trends, appropriate fee structures,¹³ and other variables that, together with the next steps described below in regard to final design of the system, will enable definition of the total cost of operating and the establishment of a sustainability plan for the system (technology solutions and related services). This will be done for each country during 2020.

ILRG views the community land administration proof of concept as a valuable investment, as a stop-gap measure to protect the results of the MAST investments in Zambia and Mozambique that are then sustained through public land administration services – if they ultimately become appropriate, accessible for communities to rely on – **or** if it yields self-sustaining community land administration that complement public land administration services through cost recovery mechanisms.

¹³ Data collected by Global Land Alliance has some information on willingness to pay community associations for updating record but it does not discuss how much of that fee could flow to the local host.

7.0 PROOF OF CONCEPT ACTIVITY DESCRIPTION

ILRG is well-positioned in both Zambia and Mozambique to lead the way in piloting community land administration approaches to sustainable documentation of customary and community lands. As described, in both countries the certification processes are unambiguously outside of the state land information system and the policy framework enables communities to manage their land and administer land rights.

Efforts to date have collected large numbers of parcels (over 10,000 in each country) and so there is a critical mass on which to test community land administration. The need for recording changes to rights over parcels and issuing updated certificates as relevant is clear and doing so soon will prevent the reversion to informality of the documents issued under the recent USAID-funded pilot project. There is capacity in each country that can be nurtured by ILRG to provide community-centered land administration services. ILRG can provide the support to develop the technology platform described in Section 5. The provider and the tools it is equipped with can provide near-term services and also fill a market niche over the long term, even while there is potential to stage an eventual integration of the maintenance database with state land administration systems (in Zambia, that will require a policy change).

Against that backdrop, ILRG plans to invest in proof of concept for community land administration. ILRG recommends the following next steps toward development of a sustainable technology platform:

- *Draft process requirements and start-up plan:* The technical team will complete the business and technology process requirements building from the content of this document in order to prepare terms of reference for the final design and development of the technology platform (central maintenance database, user portal, tool for digital submission of change requests, and workflow engine programming). Based on the design identified, build upon the rapid analysis of technology options included in this report to identify the most appropriate starting point for technology options. This may include a modular approach to each technology component described above (i.e., centralized database is open source SQL database while user portal is Esri suite). The start-up plan will include:
 - *Stakeholder engagement:* Describe how managers will effectively engage with stakeholders throughout the life of project, with specific activities to ensure that design and development is user-centered.
 - *Documentation and dissemination:* Describe how documentation will be developed and how information will be disseminated to stakeholders (who receives what, when, and how).
 - *Security and privacy:* Describe security requirements for the platform, what controls are in place, responsibilities and expected behavior of system users, and how data collected and stored in the system will be protected from unauthorized access and use. Determine whether the platform should be hosted locally or on the cloud.
 - *As-is workflows:* Ground truth workflows in Annex 4 to describe how data flows in the current system.
 - *To-be workflows:* Describe how data will flow in the proposed system.

- *Requirements:* Provide detailed descriptions of all the system properties that specify how the platform should work.
- *Host organization strategy:* The Mozambique Country Coordinator and ILRG Chief of Party will determine the best approach to ILRG supporting the identification and initiation of host organizations in each country, including which organization(s) and which roles (from simply hosting the maintenance database on a temporary basis to providing the full suite of services envisioned in Figure 2).
- *Identify a firm or consultant to conduct detailed, user-centered technology platform design.* A selected individual or partner organization will, with input from Tetra Tech's in-house technology expertise, prepare a final design for the technology platform. While previous studies have provided high-level guidance on the current state of affairs in Zambia and Mozambique, ILRG will explore a detailed design and development process. Elements of the design process should inform the start-up plan described below. The decision is also built upon leveraging independent decisions by CaVeTeCo in Mozambique. The processes in Mozambique and Zambia may follow different pathways due to the status of complementary funding, but the two countries will continue to share lessons and processes.
- *Agree on templates and data sharing requirements to enable the preparation of a TCO analysis and a sustainability plan.* ILRG and local partners will agree upon the templates and data sharing requirements and put them in place prior to development and deployment of the platform.

ILRG and the involved partner organizations will produce the following deliverables:

- Final design for technology platform;
- Agreements with local host organizations on service provider support in each country;
- Agreed template for detailed TCO framework and template for sustainability plan;
- Completed TCO analysis; and
- Sustainability plans for Zambia and Mozambique investments.
- *Develop the platform.* ILRG's technical experts or Mozambique's independently funded model, with input from Tetra Tech's in-house technology expertise, will develop the platform, customizing it as needed, and deploy it in each country with the relevant organization(s).
- *Conduct robust monitoring to inform learning.* As the platform is designed and developed, ensure the roll-out is comprehensive and monitoring is well established to inform learning. These activities include:
 - *Total cost of ownership exercise:* Details costs associated with planning, developing and maintaining a system for initial as well as out years. See Annex 5 for the proposed framework.
 - *User guide:* Step-by-step instructions for how end users utilize the system, published to Github.
 - *Systems administration guide:* Instructions for managers on deploying, configuring, and maintaining the system, published to Github.
- *Training plan and materials:* ILRG will create materials for formal training on how to use or administer the system, including learning objectives, needs, strategy, and curriculum.

This work and these deliverables will advance progress in Mozambique and Zambia on the issue of sustainability of community-based land rights documentation and also provide valuable data-driven learning for the broader community of practice. ILRG will take an adaptive management approach to the proposed proof of concept activity, working to improve the information available on requirements, options, cost, and sustainability parameter for services and technology choices.

8.0 CONCLUSIONS

In this report, ILRG provides the rationale and preliminary design thinking for the proposed investment in a proof of concept activity. The report identifies the need to refine the conceptual framework to tailor it to each country, to further develop the technical design of the community land administration technology platform and tools, and to collect data to fully analyze cost and sustainability. ILRG believes that understanding how to provide community-centered land administration services that support sustainable community land rights documentation and management over the long term is an important development priority, and that leaving the existing rights documentation to lapse is not a viable solution.

There is a need to:

- Create a land administration system that is locally accessible and relevant;
- Support the resolution of disputes over land through land documentation processes;
- Use the system to protect local rights against capture by outside interests;
- Deliver alternative development scenarios by putting data and decision making on land management in the hands of local communities to negotiate for their own interests;
- Keep land administration in the hands of households, communities and leaders with the highest level of legitimacy due to their proximity to the land itself; and
- Protect local rights and institutions, particularly those of populations, such as women, the elderly and children.

The goals are in some ways different from many of the LTR programs globally that rely on large, top-down titling programs, which do little to build local land administration capacity, or raise awareness on how communities can manage land to support their own development. These points also underline the political economy significance of the community-based cadaster. Unequal power relations enable outside interests to leverage access to local land, and titling and registration run from outside the community make the process easier. Unequal power relations also determine how local people – with or without documentation to support their rights – engage with other, more powerful economic and political actors who want their land. A community-managed land cadaster produces strong community institutions firmly rooted in legitimate local and cultural practices. If these practices are enhanced with the use of modern technology and methods, local people and their representatives can engage with more outside interests on more equal terms.

The community-managed cadaster approach is more in line with the FAO Voluntary Guidelines on the Responsible Governance of Tenure¹⁴ and with Principle 5 of the African Union Guiding Principles on Large-Scale Land-Based Investments in Africa, which stress that the best land and investment models are those that “lead to shared prosperity at local and national levels, take issues of inter-generational equity into consideration and **do not necessarily require transfers of lands from local communities**” (African Union, African Development Bank, & United Nations Economic Commission for Africa, 2014).

Yet with state systems rarely reaching down to local level, and customary systems still managing the land rights of millions of people, ignoring local-level community systems is not an option.

¹⁴ United Nations Food and Agriculture Organization, 2012.

Community land administration is therefore an LTR instrument in the first instance which then moves into a phase of managing changes in land rights. As the resulting certificates are recognized as legitimate and accepted not just by local people, but also by external agents such as banks, private sector investors, and other state sectors, the community-managed cadaster becomes an important development instrument as well. Local people are able to invest with confidence and engage with credit and other institutions that provide development support. They can also engage with greater confidence with investors and others who either want their land, or who want to collaborate with them through inclusive investment projects of various kinds.

The great strength of this approach compared with more conventional tenure regularization programs is that it uses community systems to confirm, prove and validate local rights, and thus retains local control over the rights that are formalized and certified. Local rights stay within the jurisdiction and protection of local structures and the new cadaster is much less likely to facilitate uncontrolled private sector access to land in the way that more conventional titling programs have done in other countries.

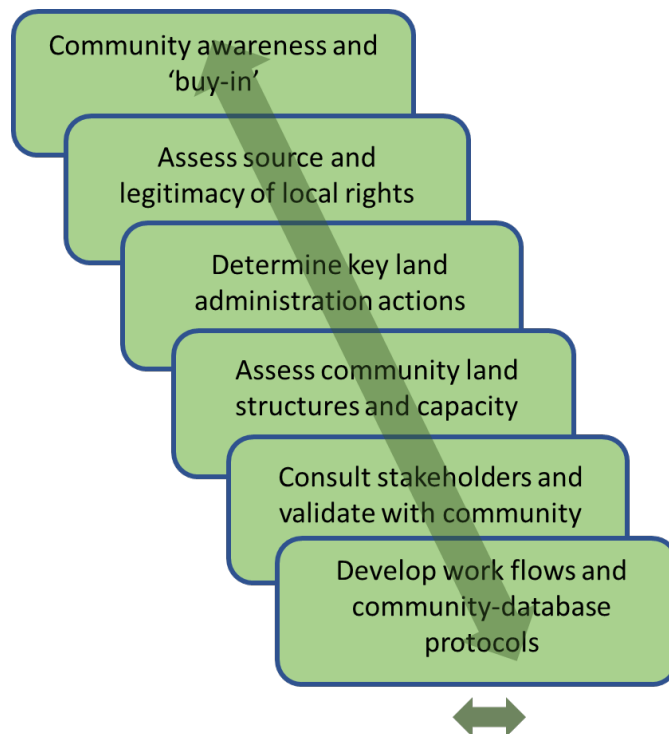
The administration system needs to act as a supporting backbone of this long-term process of protected rights and leveraging their use for sustainable development.

ANNEX I: ASSESSMENT METHODOLOGY FOR UNDERSTANDING COMMUNITY NORMS AROUND CHANGES IN LAND RIGHTS

Figure 5 presents the steps for assessing how customary or traditional management of land rights (internal community land administration) works in a community. The first step is raising awareness in the community about the assessment of their practices in regard to managing land rights and about the purpose related to establishing community-centered land administration services. It is essential that the local population understand what is being proposed and buy into it. Without their committed support, it will be very difficult to achieve success.

The opening discussion can be about the sources of legitimacy in land transactions and the basis of the authority of specific leaders and land managers. Given that it is likely that these key figures carry out roles that are passed down from one generation to the next, a discussion of the history of the community can establish and assess who exercises authority over land management decisions. If a delimitation map is already available, this can be a useful instrument for opening this discussion up.

Figure 5: Steps in Assessing Community Management of Land Rights



The steps shown in Figure 5 look at *how* land transactions and land rights are administered by local leaders and land managers; the existing capacity of local structures; how local procedures can be developed into workflows; and how to structure and support the links (communication) between the community and the database institution.

Within these steps, the assessor considers what happens as people and households transact land, go through marriages and inheritance as elders die, and sub-divide or re-allocate their land in response to changing economic opportunities and circumstances. The final assessment steps include meeting with other stakeholders and validating the conclusions with the community itself. The results will be then be used for defining final requirements for the definition of workflows, protocols, and the technology platform for recording changes. The next sections of this annex discuss in more detail the background and

approach for assessment in relation to key elements of Figure 5.

A1.1 UNDERSTANDING THE RANGE AND COMPLEXITY OF CHANGES TO LAND RIGHTS

The land administration issues that fall within the remit of this assessment methodology include:

- Acquiring and/or allocating land rights, of various kinds (use, ownership, etc.);
- Transferring or transacting these rights between parties;
- Inheriting these rights;
- Lending or renting these rights;
- Revoking or re-allocating rights;
- Managing rights over commons;
- Rights of way and similar associated rights; and
- Dispute resolution, which might include natural resources on the land.

A list of typical land transactions and the processes involved in each case is presented in Section 4. Table 6 indicates what is involved in terms of creating (C), removing (R), and updating (U) the information linked to each type of transaction.

TABLE 6: INDICATIVE LIST OF VALID TRANSACTIONS THAT MAY NEED TO BE REGISTERED AND MAINTAINED

TRANSACTION	RRR CRU ¹⁵	WORKFLOW	PRODUCT
Transfer of right <i>Transfer land right to new owners/s or change co-owners. Variations of transfers: by will; by gift; by sale; compulsory by chief</i>	Right of occupancy U	Transfer	Certificate with new owner/s
Transfer of use but not of possession <i>Rental of land for specified use and/or time; various forms of contract (payment, crop shares, labor exchanges, etc.).</i>	Restricted right of use CRU	N/A	N/A
Allocation of rights over common resources <i>Communal grazing; forests; water sources Period and conditions; Obligations to the community.</i>	Restricted right of use CRU	N/A	N/A
Servitude <i>A non-possessory right permitting a right to enter/use real property without actually owning it, usually right of way. It can be perpetual or temporal, defined by servitude agreement.</i>	Servitude C	Subsequent	Certificate
Servitude termination <i>Termination of easement by expiration of term of the easement agreement or by additional termination agreement/letter.</i>	Servitude R	Subsequent	Certificate
First registration of existing right <i>First registration of occupation right with parcel creation, parties and generation of the certificate.</i>	Right of occupancy C	First registration and parcel mutation	Certificate

¹⁵ RRR = Right, Restriction, Responsibility; CRU = Create, Remove, Update

TRANSACTION	RRR CRU ¹⁵	WORKFLOW	PRODUCT
Subdivision <i>Subdivision of land parcel with titling new child parcels. Parent parcel is archived. Certificate of the parent parcel is cancelled.</i>	Right of occupancy CR	First registration and parcel mutation	Certificates for child parcels
Amalgamation <i>Amalgamation of two or more land parcels with titling new child parcel. Parent parcels archived.</i>	Right of occupancy CR	First registration and parcel mutation	Certificate for child parcel
Resurvey <i>Resurvey of misplaced or disputable land parcel with following rectification of the certificate. Resurvey is performed for titled land parcels only.</i> In boundary disputes, proprietor or neighbor can initiate the transaction, followed by generating one or more certificates.	N/A	N/A	Certificate
Lost certificate <i>Replacement of lost certificate on request from applicant. It is recommended to mark a certificate as such to pay attention that previous one was lost.</i>	N/A	Lost certificate	Certificate
Data correction <i>An owner applies to have the certificate amended in any case where the boundaries, area or position of the land described therein is erroneous or in a situation where the description appearing in the certificate is erroneous in some way.</i>	N/A	Data correction	Certificate
Conversion of customary to leasehold <i>An owner applies for cancelling customary certificate in the system, parcel with registered leasehold tenure continues in the National Registration System. Property in the Registry is marked as archived.</i>	Right of occupancy R	Subsequent	None
Cancellation of title <i>Certificate is cancelled with defining the cancellation reason – compulsory by chief, fake title, etc.</i>	Right of occupancy R	Subsequent	None
Search <i>Search in the registry with generation of search letter. The result is a search letter with positive (details on property and parties) or negative (property not found in the registry).</i>	N/A	Search	Search letter

While it is useful to be aware of the range and complexity of land transactions that might occur, it is impractical to expect answers about all these activities in a village or focus group meeting. It is important instead to focus on some simple guiding principles while using the assessment methodology:

- It may not be necessary or desirable to codify and record every process and activity.
- There are likely to be one or two most common activities, which will involve the key figures and institutions and reveal most of the necessary information about how local land administration works; and

- The key issue in the context of a community-based cadaster is always legitimacy and the validation processes that ensures this, whatever transaction is involved.

A1.2 GUIDING QUESTIONS

It is also important to be clear about the questions that need to be asked and to understand the way in which key issues such as gender and women's land rights are brought into the discussion.

While field workers need to be aware of the range of tasks that constitute "land administration," it is unlikely that they will all occur or be relevant in the village settings. It is therefore important to assess multiple villages that reflect different contexts. Rather than attempting to address each of the transaction types listed in Table 6 one by one, it is better to have a checklist of questions that can guide discussions of those land administration activities that are identified in community meetings, and how the responses can lead to an assessment of how the most relevant transactions are administered and validated. The list of questions below in semi-structured interview format is used to guide discussions with communities, focus groups, and other stakeholders. It is arranged in a logical sequence that begins with assessing what is being done now in the customary context, looks at the specific issues surrounding women and other vulnerable groups, moves on to discussing proposals for building the new local cadaster and what is needed to do this, and ends with the question of transaction costs.

A1.2.1 CURRENT CUSTOMARY PRACTICE AND LEGITIMACY

- What transactions do community land associations, traditional leaders, and community members consider as most important in the local context and which need to be registered through the community-based cadaster?
- How are these transactions validated and what is the basis of their legitimacy?
- How are these transactions documented, and who holds this documentation?
- Is this documentation currently accessible and used in future (e.g. if there is a dispute or a change of ownership, can the original documentation be easily found and referred to)?
- What is the reasoning behind the choice of transactions?
- Are specific interests or sub-groups in the community being served?
- What are the specific roles and responsibilities of key actors in current customary processes?
- How are these key actors chosen/selected? Can they be removed and replaced?
- Are there any forms of accountability between these actors and their communities?

A1.2.2 GENDER AND THE RIGHTS OF WOMEN AND VULNERABLE GROUPS

- How do existing customary practices and behaviors affect and manage the rights of women and other vulnerable over land and natural resources?
- How should the community cadaster process be designed to ensure ease of physical and financial access by members of rural communities, considering possible barriers such as gender, marital status, age, and physical infirmity?

A1.2.3 BUILDING UPON EXISTING CUSTOMARY BEHAVIORS AND LAND SYSTEMS

- How can the creation of a new community-based cadaster improve/modify existing behaviors and practices without undermining its legitimacy and efficacy? (This is especially relevant in the context of gender and women's land rights)
- What measures can be put in place to address issues of inequality and discrimination with respect to the rights of women and other vulnerable groups?
- How can new issues and challenges be addressed in the context of creating and maintaining a community-based cadaster?

AI.2.4 INTEGRATING OR ALIGNING TRANSACTION TYPES WITH ADMINISTRATIVE/ POLICY FRAMEWORKS

- Who are the institutions/persons that would need to be involved in validating their legitimacy on a case-by-case basis?
- What should be the order of intervention of these actors, for each transaction?
- What processes should be standardized nationally?
- Which processes if any could or should be tailored for local preferences and realities?
- What forms of evidence of such involvement would be considered acceptable?

AI.2.5 COSTS

- What costs are involved in customary land management activities?
- What if any compensation is currently paid by whom, to whom, and for what services?
- How is such compensation calculated, and by whom? Is there any form of appeal?
- How can opportunity costs accruing to local land administration actors be compensated?
- Are potential users of the system, at association or individual member level, willing to pay nominal fees for transactions?
- How can these payments be integrated into or adapted for new work flows?

AI.3 A SIMPLIFIED MATRIX FOR RECORDING FIELD DATA

A simplified matrix has also been developed which addresses the key transaction areas and the critical question of what steps are taken to ensure legitimacy and approve transactions. This is presented below as Table 7. The matrix can be used to record and detail the information being generated as the list of questions guides the meeting/discussion.

Responses then indicate the work flows relating to the transactions discussed. Key moments are when a local leader or other authority figure is called upon to confirm and validate the process; or resolve any disputes. Note that these are likely to be the same individuals who may be called upon to resolve disputes and confirm the land rights of parcel holders.

TABLE 7: SIMPLIFIED TRANSACTIONS LIST AND KEY ACTORS/ACTIVITIES

PROCESS	KEY ACTORS	ROLES/ RESPONSIBILITY	SUPPORTING DOCS AND OTHER EVIDENCE	HOW RECOGNIZED? (OBJECT, ACTION, CEREMONY, ETC.)	GENDER ISSUES	COST FLOWS
Validation of land transaction when required (legitimacy)						
Transactions between third parties (sale of land or subdivision and sale)						
“Internal transactions” (principally inheritance)						
Ceding use and other forms of rental						
Management of commons and rights of way to key resources						
Other activities						

AI.4 STAKEHOLDER ANALYSIS

The focus of the work for which this assessment methodology is relevant is community-centered at the local village level, and this is where the stakeholder analysis should start. However, customary land systems function within a complex hierarchy of governance and administrative bodies that reach up to the national level, where public land administrations and political and economic power are concentrated. All these levels need to be considered in order to understand how to construct a community-based cadaster that can survive and prosper within the prevailing political economy of its respective country.

The stakeholder analysis also considers what the roles of each set of stakeholders might be when it comes to both creating the new cadaster and subsequently managing changes to the existing rights that have been mapped and recorded.

AI.4.1 COMMUNITY ACTORS

AI.4.1.1 LOCAL COMMUNITY MEMBERS

The principal stakeholders who will benefit from any LTR process and maintenance cadaster are those whose land is being registered and certified. It is important, however, when assessing how land rights are

managed to consider who is being managed and who falls under the jurisdiction of specific land administrators and leaders. In this context, community members are those who live and use resources within the area defined by the community delimitation.

Community members will also have access and use rights over commons and collectively-held land and resources. Rights over these areas are held and managed collectively and are also an artefact in the cadaster.

The role of local community members in the specific context of the new cadaster is to participate in the identification of their land on the ground during the parcel identification and mapping process; produce forms of evidence that they hold legitimate rights over it; confirm the rights of their neighbors who are similarly identifying and proving their rights; and confirm and legitimize the role of local leaders and others who claim authority over land matters at community level. Community members may also have assigned roles in the administration and management of collective resources; these need to be considered as the assessment progresses.

AI.4.1.2 WOMEN

Women in most customary contexts have a form of land use right over the land they access and cultivate, rather than a right of ownership or possession. This use right is gained through their participation in key societal institutions, principally marriage and membership of extended families. In other words, women in customary contexts mainly get their land rights through their relationships with significant men: their fathers, their husbands, their uncles (in the case of matrilineal systems). A principal policy concern is also to ensure that the land rights of women are enhanced and protected to the extent that they acquire possession or ownership in their own names with documents that reflect this.

It is important, however, to remember that even where customary norms and practices are referred to and often emphasized, many traditional norms and practices are changing rapidly. Rural systems today are often dynamic and are responding to new opportunities and pressures, such as the increasing commodification of agricultural production (leading to men overriding established rules on women's rights), and trends towards direct inheritance from a woman to her daughter instead of via maternal uncles, etc. The assessment should therefore consider not only how women's rights are administered in the customary context, but how current norms and practices can be adjusted to achieve this objective.

Regarding the collective use and management of commons and collectively-held land and resources, it is important to assess the role of women in this context. Beyond getting women's names on certificates, an updating solution for community land rights documentation should ensure that women's roles as decision makers with respect to these areas are clarified and strengthened. A similar point applies to their access to the benefits that accrue from land administration decisions and processes that happen through the community-managed cadaster.

Women often use different areas of land and resources than men. In many societies and rural communities, they will also be relatively disengaged when it comes to meetings with outsiders and teams working on land issues. It is imperative that separate focus group meetings are held with women on their own to fully understand how their rights are administered and what the challenges are facing a cadaster that is also seeking to secure and enhance the rights they enjoy over land.

AI.4.1.3 YOUTH

In the context of diminishing land availability and a demographic heavily set at the younger end of the age range, young people are finding it increasingly hard to find land to occupy and use in their own name. Most land will be held by their elders, with prospects for inheritance some way off. Internal transactions and informal agreements over allocations of family land may be seen as something outside the remit of a cadastral program, where existing rights holders are reluctant to formalize what they see as amicable

and understood intra-family arrangement. Questions about inheritance and access to land by youth need to be mindful of these specific circumstances and what may be needed to record and certify the gifting or informal allocation of land.

As with women, it will be important to work separately with youth to understand their specific issues with relation to land administration activities and challenges.

AI.4.1.4 TRADITIONAL LEADERS

The customary land management system will be managed by predominantly male leaders. These may be local clan or lineage heads, or higher-level chiefs who have authority over a much wider area and several village populations. Often these higher-level traditional leaders will not be involved in the day-to-day administration of local land and will have lower level chiefs or other figures acting in their name to verify and validate land transactions.

Traditional leaders are likely to come from specific families that are linked back to the earliest days of the community in question and have acquired a hereditary authority to rule over the community and act as a kind of supreme authority when it comes to disputes and other key issues including land and natural resources management.

Identifying these leaders and understanding their roles in land management is therefore a key issue for those using this methodology. The assessment also needs to consider their roles and authority relative to other figures who may hold government or political office at local level, but who may not enjoy real legitimacy in the eyes of local people.

Traditional leaders are likely to have a key role in the confirming and validation of existing and new land rights, and in validating changes in rights that result from sales, marriages, inheritances, etc. This role may be rooted in their historical origins as founding families and thus inherited. This is not always the case, however, and even established leaders can be rejected or replaced by the communities they serve. In this case it is essential to consider the legitimacy of these processes and if this is recognized in some way in the land administration/local governance context.

AI.4.1.5 OTHER LEADERS

There are also what can be called “development leaders,” those people in all communities who have acquired authority through their role in new institutions like water pump committees and health committees. Many of these people are women, as the projects that create these entities usually include a strong gender imperative to bring women into leadership roles and give them a voice in local development practice. Such leaders are important sources of information and should be included in meetings and focus groups to discuss land issues; they are key actors to consider when developing a sustainable and equitable community-based cadaster. Critically, they are also often central to the process of affecting normative change in areas such as women’s land rights and the right of women to participate fully in decisions over community-held resources.

The role of these “development leaders” is often one of promoting or leading change, especially when it comes to adopting new norms and practices covering the day-to-day life of the community. They often receive special training in the context of the projects that have been attached to, and have skills and capacity that can complement and enhance the work of the more traditional elements who may have land administration roles. They are likely to be important in discussions of how to adapt or change existing land norms and practices with respect to women’s land rights.

AI.4.2 LOCAL GOVERNMENT

Customary or traditional leaders do not operate in isolation in modern societies and economies. They are subject to and interact with government institutions and actors with political and administrative authority over them. Figures such as district administrators are likely to have a significant role in land management matters, and formal local government structures and political party structures will include people at the local level who represent them and ensure that the government or party line is followed when development decisions are taken.

It is important to account for these local government figures and take care to understand how they interact with customary land administration structures. These relationships have major implications for how the products developed by a community-managed cadaster are subsequently treated by government agencies, which in turn will impact on how certificates and local land rights are looked at by other actors such as private sector investors looking for land.

Each level of local government may also have a specific role in land management and endorsing or supporting the authority of customary land administrators. The assessment will have to consider the roles of local government officials at each level when it comes to developing the work flows and establishing the legitimacy of the community-based cadaster.

Local government agencies are likely to have some kind of role in resolving conflicts that cannot be resolved at the local level. They are also involved in facilitating or guiding consultations and contacts between communities and outsiders such as investors looking for land for their projects. A key question is whether the authority of customary land administrators depends upon confirmation or endorsement by the respective local government officer or some other government representative.

AI.4.3 NGOS AND OTHER CIVIL SOCIETY

NGOs working in and with the communities being assessed are always key entry points to the community itself, as they are known and trusted by the community. They are important sources of information for assessing customary practices regarding land and natural resources management. They may also have a direct interest in the outcome of the assessment insofar as they are logical potential implementation partners.

NGOs are both interlocutors and active agents in the field when it comes to implementing an assessment and setting up a community-based cadaster. They will have significant local knowledge and will be well placed to identify local leaders and facilitate the discussions that are necessary to carry out the assessment. They are also likely to be able to work with communities in local languages.

AI.4.4 HIGHER-LEVEL ACTORS

Higher-level stakeholders affected by or with an interest in the community-based cadaster will include:

- National public land administrations and their respective offices and services at central, provincial, and district level;
- Provincial or regional governance institutions and leaderships;
- Central line ministries responsible for land and natural resources management;
- Civil society organizations that may also work at local level in the project area;
- Associations representing different interest groups (small farmers, financial agencies, the private sector); and

- Private sector entities (investors, funding agencies, firms).

All of these will have some role in the background as the community-based cadaster is investigated and then constructed at local level. Political decision makers at the central ministry level will be key figures at some point as the legitimacy and validity of the work and products of the community cadaster begin to appear and have an effect on local level development and land management decisions. It will be important to consider how to bring these different higher-level entities into the process of conceiving, researching and developing the community-based cadaster model.

AI.4.4.1 PRIVATE SECTOR

Private sector firms and individuals may already be occupying and using local land or be looking for local land for their projects. Investors and those who represent them – which may often include local government figures charged by the central government with promoting new investment – will develop relationships with local leaders, both traditional and non-traditional, and will have a clear impact on how local people perceive the need to formalize and protect their land rights in some way.

As a rule and based on prior field experience, where no immediate threat to their land is felt by local people, they are less inclined to bother with things like community land delimitation and certification; where investors are present and land has already been allocated by the state over the heads of local people, the support for a community-based cadaster may be very different.

Investors are not always looking for land, however. Investment projects may consider options that leave land rights with communities and their constituent families and involve (potentially mutually beneficial) relationships between communities and companies (joint ventures, out-growers, contract farming, etc.). In all of these cases, making local rights visible and providing solid documentary evidence of rights that an investor can recognize and relate to are important preconditions for any subsequent negotiation over access to local land or the development of inclusive agreements.

Private sector actors need to understand how and why the community-managed cadaster has been developed, the basis of its legitimacy, and who they should consult and work with when they look for land or want to negotiate other agreements with local people. To have real meaning, a successful community-based cadaster will not only clarify and protect local rights over specific land parcels, but its products – certificates and other documentation – must be accepted as legitimate and legally binding by external, private sector actors (even if national legislation does not yet formalize this). Private investors should see the community-managed cadaster as a vehicle through which they can engage transparently and constructively with the community in the pursuit of mutually beneficial and inclusive investment and development proposals.

AI.5 ACQUIRED EXPERIENCE AND CHANGING ROLES

The proposed model for providing land administration services that cater to the needs for community-based land rights documentation should build on experiences and partner knowledge of how customary administration currently works under existing local and national systems. This will include experience and knowledge about the constraints and difficulties faced by customary actors and institutions when dealing with external or higher-level structures.

Public and civil society actors and institutions already have significant levels of acquired experience working on land issues at local and community level. These actors may or may not continue to play the same role in the future, when a new system is developed to integrate local land management practices into the wider administrative and policy framework. The model will have to consider current and future roles, being aware that in some instances the role may change or be rendered obsolete by the proposed new systems.

In this context of building on existing local land management practices and the acquired experience of various actors and partners, it will be important to consider a range of characteristics attached to each actor and/or institution. These can include:

- Their location and coverage of the area in question;
- The checks and balances that regulate or condition what each actor and/or institution does;
- The relative authority of each actor/institution, and the source and legitimacy of this authority, and relationships amongst different authorities; and
- The scale and capacity of each actor/institution and their ability to create and maintain adequate, accurate and up-to-date records.

ANNEX 2: MOZAMBIQUE CASE

A2.1 POLICY AND LEGAL FRAMEWORK

The Mozambique land policy and legal framework is recognized as perhaps one of the best in Africa.¹⁶ Indeed, to quote the start-up plan for the Cadastro Popular, “Mozambique is equipped with one of the best policy and legal frameworks for land tenure ... [which contains]... a crucial combination of clauses that open a huge opportunity for the rural poor to undertake the *self-documentation* of their land rights.”¹⁷

Customarily acquired land rights are constitutionally protected, and the various normative legal systems that exist in the country are also recognized as legitimate and valid provided they do not contravene fundamental constitutional principles. This means that land rights allocated and managed through customary systems are constitutionally validated. This validation is given force in the 1997 Land Law which also lays out a clear land management role for the “local communities”¹⁸ that hold collective land use and benefit rights, or DUATs, and use customary norms and practices to manage all the different land and natural resources that exist within their borders.

The 1995 National Land Policy and the 1997 Land Law explicitly recognize customarily managed rights as fully equivalent to the state-allocated DUAT, which is the only legal right over land in Mozambique. There is no distinction between customary land or any other kind of land: the DUAT is acquired either by occupation according to customary norms and practices; by good faith occupation (open and unopposed use for ten years); and by requesting a new land right from the state.¹⁹ The law and its regulations then go on to provide innovative mechanisms to ensure that DUATs acquired by occupation are safeguarded when investors arrive looking for land, and that access to local land is only possible through a process of “community consultation.”

Article 14 of the 1997 Land Law states that these acquired rights – which remain in force even if they are not formally registered – *can be proven and upheld by members of the local communities that allocate and manage them.*²⁰ Article 24 also calls for local communities to *participate in the management of land and natural resources using, “amongst other things, customary norms and practices.”* This role includes defining the limits of the collective DUAT held by the community over the land it occupies and uses (a process called community land rights delimitation); participating through consultation in the allocation of new DUATs to outsiders; and *managing the internal allocation of land rights (customarily acquired DUATs) to community members.*

The legal framework therefore provides a clear basis of developing a community-managed land cadaster. However, the government has failed to use this key feature of the legal framework and has instead

¹⁶ See for example Patrick McAuslan. 2013. *Land Law Reform in Eastern Africa: Traditional or Transformational?* London, Routledge

¹⁷ Terra Firma, op.cit., p13, emphasis in original

¹⁸ A legally-defined entity in the 1997 Land Law, reflecting the physical and social aspects of land use and occupation systems, and defined as: A grouping of families and individuals, living in a circumscribed territory at the level of a locality or below, which safeguards common interests through the protection of residential areas, agricultural areas, whether cultivated or in fallow, forests, sites of cultural importance, grazing land, water sources and areas for expansion (Law 19/97, Article 1(1).

¹⁹ Unlike Zambia and indeed most other African states, there is no division of the country into customary and “formal sector” land. Indeed, the whole country is “customary” insofar as it effectively fully covered by local communities with collective DUATs over large areas with common borders. DUATs allocated by the state to private investors exist within and alongside local communities, as an integral part of the same landscape.

²⁰ Articles 12-15 of the 1997 Land Law; and Article 21(b) of the 1998 Land Law Regulations

adopted a conventional, top-down LTR approach that does little to engage with and build the capacity of local land management structures. This is where the Cadastro Popular comes in, offering an approach to LTR that is rooted in local practice and works with local structures to identify and prove acquired rights, and then issue certificates to individuals and households living within their respective local community. This system is accessible, legitimate, sustainable, and effectively manages the constant changes in land rights that can quickly make a more remote and unresponsive LTR database obsolete and irrelevant.

Traditional systems also have processes at multiple levels for addressing land issues. These allow for land allocation at the most local level of traditional leadership; regular (often fortnightly) traditional “courts” that hear and address land conflicts; and widely understood and followed procedures for taking cases to more senior, customary levels. However, information is often documented in the same notebooks that hold information on other kinds of problems, such as domestic abuse and petty theft. There are no dedicated land data sets, and it is therefore important as part of the process of working with customary land management structures to find a way to create a proper local land management database. This database can then be strengthened and maintained by providing support through effective, technically-enhanced land management.

A2.2 MOZAMBIQUE LAS

A2.2.1 SIGIT

SiGIT is a national land registration system, implemented at the DINAT and developed by EXI Lda²¹; it was financed initially by MCC and subsequently through the Capacity Building Programme on Land Management and Administration (GESTERRA) project, with Swedish and Dutch government support.²² By the end of the MCC-financed project, 114,000 titles had been issued for municipal land, along with over 10,000 titles in rural areas, and 20 land use maps had been produced in the municipalities and 12 districts.²³

The focus of the SiGIT is the development of a land data management and administration system using geo-referencing, with the objective of consolidating the national land registry. The project was implemented in the DINAT, in all the Provincial Services of Geography and Cadaster (SPGC), and several municipalities at national level. At the moment, the project is in the stage of extending services to the regional centers, each of which is intended to serve a number of districts. The system uses technologies from the following companies: Oracle (Oracle Database Enterprise Edition + Spatial Option), Esri (ARCGIS Server, ArcGIS for Server Web Application), and Microsoft (Windows 7).

A2.2.1.1 SIGIT FUNCTIONALITIES

SiGIT functionalities include the following:

- Collection and registration of data of citizens, companies, and other type of entities;
- Massive regularization of DUAT;
- Legalization of DUAT through customary and bona fide norms and practices;

²¹ <http://exi.co.mz/>

²² <https://openaid.se/activity/SE-0-SE-6-5114000401-MOZ-31110/>

²³ SIDA, Midterm Review of GESTERRA Capacity Building Programme on Land Management and Administration within DINAT, October 2016.

- Processing of DUAT acquisition applications;
- Delimitation of community areas and registration of committees for management of natural resources;
- Calculation and registration of payment of DUAT and Imposto Predial Autárquico fees;
- Issuance of construction licenses for municipalities;
- Inspection of plots under DUAT;
- Synchronization of data to the national registry; and,
- Earth Portal.

The SiGIT was initially designed as a system to support the state allocation of discretionary DUAT rights to investors and hold data on such “titled” rights. With the advent of the Terra Segura program, launched in 2015, and the new government of Mozambique (GoM) focus on documenting statutory rights (based on customary or good faith occupation) acquired by current occupants, the SiGIT has had to be modified to deal with a different set of workflow processes and outputs, many of which are ambiguously set out in legislation. There remain many problems with the system’s ability to process data in respect to these rights.

A2.2.2 TERRA SEGURA

The national Terra Segura program aims at documenting and mapping the rights over some five million land holdings within five years. This is all to be stored in the SiGIT system. The main objective of the program is to ensure that acquired land rights of communities and individuals are finally brought into the land administration system and made visible.

A2.3 A NEW COMMUNITY-MANAGED CADASTER – THE CADASTRO POPULAR

Mozambique is also useful as a case study because it has projects already trying to explore how to create a community-managed cadaster. The Cadastro Popular (CP) is one response to the challenge posed by Articles 14 and 24 of the Land Law, and the lack of engagement by the public land administration with local level structures. The CP uses digital tablet technology to firstly delimit “local community” boundaries, and then identify and delimit the boundaries of separate family and lineage-occupied parcels of land *within* the borders of their local community.²⁴

By effectively applying the law as it is related to customarily-acquired land rights, the CP gives visibility and formal legal protection to local rights that may be legally recognized and protected but are not formally registered. This ensures that they are less vulnerable to capture and land grabbing by external interests; it also enables the holder of the right – with CP documentation – to leverage their status to secure credit and engage with investors and others through negotiated agreements over land access.

Critically in the Mozambican context, the local community has a legal personality as a rights-holding entity, with a delimitation certificate issued in its name. To facilitate the land management role of the

²⁴ The Cadastro Popular can be integrated into strategies that promote sustainable and equitable rural development, such as CaVaTeCo (Cadeia de Valor da Terra Comunitária, or Community Land Value Chain). An essential first step is to delimit the local community, which secures the collective DUAT over the land occupied by local community members. Households can opt to map and certify their individual rights managed ‘according to customary norms and practices’ (thus creating the cadaster). The focus of CaVaTeCo is to promote an active and mutually beneficial engagement between local people and incoming investors, which results in positive development outcomes for both sides.

local community, however, CaVaTeCo creates a governance structure which can then assume the land management functions described in the 1997 Land Law and its regulations. This structure is the community property association (community association), which exactly mirrors the delimited borders of the community and by its own statutes includes all members of the community as members.

This community association structure then takes on the enhanced land administration tasks that arise from the process of delimiting the community and mapping the individual parcels of each family or extended kinship group. Once the data is checked and recorded in the CP database, certificates are issued by the association in the name of the rights holder (or holders, men and women in the case of married couples).

Each certificate shows the parcel in question (see the red circle in Figure 6), as well as the borders of its neighbors (all of whom will have confirmed and agreed upon the borders and areas during the tenure regularization process). Crucially, and underling the close functional relationship between this new structure and the traditional land administration, each certificate is signed by both the traditional leader (yellow circle in Figure 6), and the president of the community association (blue circle).

The innovation behind CaVaTeCo and the CP which it is helping to create, is that it “is geared towards assisting local communities and their members to exercise their rights... leveraging the statutory land rights already acquired by most rural land occupants under the Mozambican law.”²⁵

The end points of the process of exercising local rights are important. They provide the context and justification for the questions asked in this assessment and should guide how the answers are then converted into workflows and, ultimately, into land data and certificates. These end points may include:

- Increasing the effectiveness of local community participation in land allocation processes conducted by the state;
- Leveraging local community statutory rights to receive a percentage of local resource use license fees;
- Taking up opportunities to establish partnerships with commercial operators, or to restrict the access of outsiders to local land and resources;
- Developing conservation approaches that enable a community to benefit from programs related to enhancing carbon sequestration or protecting ecosystem services; and/or

Figure 6: Certificate for land parcel within a delimited community

NOME	SEXO	DATA NASC.	TIPO DE IDENTIFICAÇÃO	IDENTIFICAÇÃO	DATA EMISSÃO
Laura Alberto Nabilende	Feminino	17-11-1997	Cédula Pessoal	329694	26-05-2012
Maria da Conceição	Feminino	06-08-1974	Cédula de Eleitor	07908735	25-04-2014

(II) DATA DELIMITAÇÃO: 04-12-2017 (III) TITULO: Alberto Nabilende (IV) PRazo: 30 Dias (V) PRazo: 22-11-2018

(VI) Parcela # 040000005-0000 (VII) Área aproximada 1,8 hectares (VIII) Cálculo da Área: 1,8 hectares

(IX) Assinatura do Presidente da Associação: José Carlos Silva (X) Assinatura do Tradicional: José Paulo Silva, Jr.

²⁵ Terra Firma, op.cit. p 6, emphasis added

- Enabling individuals and families to demarcate their own lands within the collective holding, including addressing tenure issues for women and other vulnerable members of the community.

The CP thus offers a different vision of LTR that is geared towards a more inclusive and equitable process of rural development. This model is rooted in local practice and works with local structures and actors to construct an effective, technically-enhanced land management system. This system results not only in rights being registered and documented, but also in a system that is accessible, legitimate and sustainable; and which can manage the ongoing and constant changes in land rights and land use that quickly become the major challenge of any land administration.

The ODK-based CaVaTeCo data collection kit and methodology, developed and tested by Terra Firma, has been deployed in two successful pilot projects in partnership with ORAM Nampula. It is being used in a DFID-funded project covering 20 communities in Zambézia Province and in another 30 communities in Nampula Province funded by the Dutch government. Components of the CaVaTeCo are also being deployed within the Maragra Sugar Estate in Maputo Province, in partnership with the Illovo Group. Within this CaVaTeCo approach, all data that would be required by the SiGIT to process a DUAT is collected under processes that are locally managed. These rights are certified locally through the issuance of a document generated by the CaVaTeCo platform but issued by a local association representing the community. In the future, members of a community that wish to leverage the additional opportunities that might arise from the acquisition of a formal, state-issued DUAT title will be able to request that their applications also be submitted to the cadastral authorities. The data on all the parcels currently in the CaVaTeCo platform can already be introduced into the national land information system (no data has, however, yet been introduced) so that all the identified land rights can become “visible” within the cadaster.

A2.3.1 CAVATECO PROCESS, PHASES, AND WORKFLOW

The process of first-time, systematic data collection, leading to final issuance of the DUAT declarations, can be grouped into seven phases:

- *Phase 1: Sensitization.* Training, information, and community awareness, team mobilization, community awareness. Possible resolution of this phase is termination of activities, if a community or group does not choose to proceed;
- *Phase 2: Registration of association.* Establishment of legal entity, in the form of an association, meetings at village and community levels;
- *Phase 3: Community land delimitation.* Field intervention to capture community boundaries for the issuance by the state of a formal certificate of delimitation of local community DUAT;
- *Phase 4: Field demarcation and registration.* Field survey with collection of parties and parcels information, parcel layer created in the GIS;
- *Phase 5: Objections and corrections.* Publication period to collect objections and make correction in the parcels/parties records;
- *Phase 6: Certification.* Bulk issuance of certificates for households; and,
- *Phase 7: Integration of information for land use planning.* The mapped out and legitimate land rights need to be an input into the process of developing an LUP.

A2.4 MOZAMBIQUE FIELD WORK: BEHAVIORAL ISSUES

The methodology was applied over the course of four days in Ile District, Zambézia Province in three communities. Meetings were also held with the Ile District Administrator and the Head of the District Directorate for Economic Activities, which includes land management in its brief.

These meetings confirmed that the process of gathering information to fill in answers to the list of questions requires several community meetings that are prepared beforehand and dedicated to the discussion of customary land management processes. It is also useful to accompany meetings scheduled for other purposes; in this context, two meetings were attended that were organized to distribute certificates to community members, and to discuss the development of a community land use plan (CLUP). Accompanying the CLUP process offers good opportunities for addressing collective issues such as the management of common land and the securing and registering of rights of way (for accessing water and driving cattle to pasture, for example).

At the end of the fieldwork, the list of questions and the matrix of land transactions was discussed with the NGO team implementing the community land rights delimitation project. This meeting proved particularly useful for drilling down to conclusions about key transactions and the critical role of traditional leaders in the validation and legitimization of land rights processes.

Current customary practice and legitimacy

- What transactions do community land associations/traditional leaders/community members consider as most important in the (changing) local context and which need to be registered through the community-based cadaster?

As a first step in a community where no previous mapping has taken place, the most important priority is to work with the community association and the project to carry out the process of parcel mapping, using GPS-based techniques and working closely with local leaders and the occupants and neighbors of each parcel of land.

Following on from this and once the whole community has been mapped in this way, the most important transactions that require registration, etc. are those arising from the sale of and/or subdivision of land. It is also possible that in the future, registration may be required for documentation of loans or other financing, as models emerge.

Other transactions that involve inheritance may not require registration, because this is an internal household and family issue, and everyone involved knows what is happening. It is clear in this context that local people do not want to feel compelled to register their land rights, although all those in the meetings attended clearly understood the value of having a certificate which proved their rights and their spatial dimensions.

While people should be forced or mandated to go to the association and record changes to generate a new certificate, the reality is that if they do not, the database will eventually lose currency and become obsolete. As the system is established and people increasingly trust, appreciate and value its benefits, the tendency to not upgrade rights or bypass the system should diminish.²⁶

- How are these transactions validated and what is the basis of their legitimacy?

The first step in a land sale agreement is the contract between the two parties. This may be signed by witnesses and is a matter for the two parties involved to deal with without reference to land

²⁶ The difficulty of ensuring that rights acquired through succession in the customary context are recorded and certified is compounded by the system established under formal Mozambican law (Civil Code, Family Law). Changes in this regard are beyond the scope of a community-managed cadaster, which meanwhile should include provisions for registration/updating rights and prohibiting interference/oversight from outside actors.

administration figures. The régulo or land chief is then called on to confirm and validate the details of the agreement. These days he will sign or stamp a short document to this effect. At this point he receives a small payment (MZN 50 – 300), and the parties involved host a lunch for those present (usually a chicken and some drinks). The party and food are not in any sense formally required as a condition for things to move forwards but are socially expected.

The sale and rights-changing transactions are validated always by the traditional leader or one of his sub-chiefs. The basis of their legitimacy is their being descendants of the founding family in the area, and this authority is widely recognized by all community members.

- How are these transactions documented, and who holds this documentation?

The validation of land processes by the traditional leader involves his signing a declaration and being paid a small sum for this (MZN 100, or about USD 1.50). At the time of signing a ceremonial lunch is provided by the parties to the transaction. This is not part of the indigenous legal process and is more of a social convention. In other cases, this cost may be in the range of MZN 100 – 300.

In the CaVaTeCo/CP context, where rights have been mapped and a community association established, the parties to a transaction can seek registration and certification. In this case they take the document signed by the régulo, and their contract, to community association which confirms the agreement on the ground and takes readings of the new dimensions of each plot. The data is submitted to the database and eventually two new certificates are issued.

There is common and widespread acceptance that the certificate should be signed by both the traditional leader and the community association.

With the declaration the two parties to the transaction go to the community association and the process of confirming the boundaries of the parcel of land and issuing a new certificate begins. The declaration signed by the leader is the essential item to initiate this process.

The documentation is held by the community association (the local secretary has control of any maps and other material albeit in precarious conditions and at risk of damage or loss from fire and other incidents).

- Is this documentation currently accessible and used in future (e.g. if there is a dispute or a change of ownership, can the original documentation be easily found and referred to)?

Each person or household in the CP process receives a plastic-film covered copy of the land certificate; this is held by them and can be used to assert their right over the land they occupy. Whether this can be easily found is a matter for the certificate holder to determine.

- What is the reasoning behind their choice of transactions?

The communities focus on situations where land use changes and/or where land is subdivided and sold; these are viewed as potential sources of conflict if they are not handled properly. The focus is not on the different ways in which a new right is being created (sale, inheritance, etc.), but more on the validity as confirmed by the leaders and other social interventions.

- Are specific interests or sub-groups in the community being served? If so, what are they and are they compatible with the overall objectives of the ILRG program?

This question requires more extensive meetings but on the basis of the meetings attended, there do not appear to be specific groups being served or favored by the CP method. Some cases where there were ongoing disputes were concerned that they had not yet had their processes approved and had not yet got their certificate.

- What are the specific roles and responsibilities of key actors in current customary processes?

The stakeholder analysis carried out both before the meetings (with the NGO team) and with the assembled community, underlined the key role of the traditional leadership in the land management process. The leader is key for validating sale and similar transactions and any other transaction that requires his approval to move forwards. The leader is responsible for assessing the legitimacy of the transaction (although in this context he also relies on a contract between the transaction parties being available which confirms that both sides are in agreement).

Community members were clear that the presence of the community association was important because of its role in demarcating land which has reduced conflict and provided people with the security of the certificate. The over-riding impression was that they value the roles of each side, the traditional leader and the community association.

Local government also has a key role in the application of the framework and in the subsequent exercising of rights that are proven and certified. Thus the district administration: 1) has a role in the adjudication of land disputes that cannot be resolved by traditional leaders; 2) is legally responsible for facilitation of community consultations involving investors that are seeking land; and 3) supports the development of community infrastructure that requires land and may necessitate local resettlement, such as dams for small scale irrigation schemes.

The public land administration services at district level also play an important interlocutor role between the communities, NGOs and other projects supporting land rights activities, and the provincial and central government institutions that have key tasks such as issuing certificates of delimitation and approving the allocation of new private sector DUATs in areas where community land rights already exist.

- How are these key actors chosen/selected? Can they be removed and replaced?

The traditional leaders inherit their authority through their family line. They retain this role until their death, when it is transferred to a son or nephew. While this pattern is generally accepted, it is possible to take these powers from leaders through internal processes, although this is not common.

Where there is a community association, the president and other officers are (s)electd by the community, men and women. These officers are elected for a certain period and can be replaced at the time of turnover.

- Are there any forms of accountability between these actors and their communities?

It is difficult to say based on the meetings attended. Without spending more time in the community, it is impossible to say how accountable leaders are, although it is clear that local people are more aware of their rights and are less awed by the presence and role of the traditional leader.

Gender and the rights of women and vulnerable groups

- How do existing customary practices and behaviors affect and manage the rights of women and other vulnerable over land and natural resources?

In the area visited, women appear to have strong rights over the land and in some cases appear to have priority over their male siblings when it comes to inheriting (although this point requires more time and careful conversations to confirm or correct).

Women who lose their partners prematurely seem to be at risk of having their land taken by the deceased husband's family. One case of this sort was encountered. The woman concerned was clear that if she had had a certificate, this land grabbing would not have been possible.

- How should the community cadaster process be designed to ensure ease of physical and financial access by members of rural communities, considering possible barriers such as:

- Gender

In the meetings attended, women participated directly in discussions and voiced clear opinions about the value of the certificates and their rights to hold land in their names. Those receiving certificates clearly appreciated the moment and saw the certificate as an important guarantee of their rights over their land.

With regard to financial access, when costs were discussed there was no disagreement between the men and women present.

- Marital status

Women present in meetings to distribute certificates appeared to be very clear about the need to have their names on the certificate alongside that of their husband. The process leading to this acceptance involved the CaVaTeCo team discussing this with the communities in preparatory meetings and securing acceptance from the men and women present.

- Age

Further meetings are required to answer this. However, on the basis of experience in other contexts, it is likely that without any formal land registration and certification, children who lose their parents (land rights holders) are in a very vulnerable position and risk having their land taken over by uncles or other extended household/lineage figures. In this context, a process such as a community-managed cadaster with associated certification of rights is an important platform for securing a child's rights (although this is still subject to malpractice and opportunistic behavior, which may or may not be resolved by the régulo or land chief and other village/family elders).

- Physical infirmity

This issue was not addressed in the meetings attended. Given the situation of vulnerability faced by women and children however, it is likely that the elderly and infirm will face similar risks. A community-managed cadaster and certification will establish a more secure platform from which to defend rights and effect changes in behavior amongst other parties and stakeholders.

Building upon existing customary behaviors and land systems

- How can the creation of a new community-managed cadaster improve/modify existing behaviors and practices without undermining its legitimacy and efficacy? This is especially relevant in the context of gender and women's land rights.

Retaining the role of the customary leaders while enhancing land administration capacity with modern and recordable procedures implemented by community-based associations or similar new structures will modify practices while retaining the core legitimacy of the customary system.

- What measures can be put in place to address issues of inequality and discrimination with respect to the rights of women and other vulnerable groups?

See response above.

- How can new issues and challenges be addressed in the context of creating and maintaining a community-based cadaster?

It will be essential to create a strong civil society capacity to provide support to and run the cadastral side (database etc.) of the community-managed cadaster. Setting up new structures like community associations in each community, with elected leaderships and activists will also allow communities to evolve along a trajectory where they accept the value and usefulness of having their rights registered and certified, in a locally-managed context that generates and maintains confidence.

Securing the buy-in and acceptance of government and other external actors is also an important condition for longer-term recognition and maintenance of the community-managed cadaster (underlining here the increasing acceptance by banks and development partners of the certificates and other documentation as inputs to negotiated land access and land sharing partnerships).

Integrating or aligning each transaction type with administrative and policy frameworks

- Who are the institutions/persons that would need to be involved in validating their legitimacy on a case-by-case basis?

Provided that the community-managed cadaster is accepted as a legitimate and legal response to the challenge of providing land administration services to the lowest level or rural communities and the poor, there would be no need for administrative verification and validation of legitimacy on a case-by-case basis. The key thing here is to ensure that the core principles and practices of the cadaster are within the parameters of national law and administrative regulatory frameworks and do not contradict or threaten these.

- What should be the order of intervention of these actors, for each transaction?

At the level of the community, the confirmation and validation by the régulo and/or land chief appears to be the first order of intervention. This is followed by the activities of the association with its technical confirmation and validation of each process ahead of registering the data and issuing certificates. Only in the case of disputes that cannot be resolved at local level, would any higher-level actor (district administrator, district judge etc.) become necessary.

- What processes should be standardized nationally?
 - *The focus on ensuring that all transactions are assessed and confirmed by an acceptable legitimate local leader with historical memory/role as land manager in the local context.*
 - *In this context the workflow only needs to record the kind of transaction involved, with the focus being on how this is legitimized and validated by local structures.*
 - *Setting up a complementary new structure to take on the modern, formalized upgrade to local customary land administration (surveying, recording data, submitting data to the database, certification, etc.).*
- Which processes if any could or should be tailored for local preferences and realities?

This can only be answered on a case-by-case basis; the assessment should include space to discuss locally specific processes and requirements

- What forms of evidence of such involvement would be considered acceptable?

Current procedures whereby the confirmation and approval by régulos in written form is already an advance on traditional verbal agreements, provide a good basis for establishing new forms of evidence (these could be developed and proposed to the communities by their respective associations and/or supporting NGO/database institution).

Costs

- What costs are involved in customary land management activities?

Small payments are made to the traditional leader at time he validates a transaction. Payments to the community association were discussed in theory (as no transactions had yet taken place where payments to the community association/project were required).

- What if any compensation is currently paid by whom, to whom, and for what services?

At this point, the point at which the régulo confirms and signs off of a specific transaction results in a small payment to him of MZN 50 – 300. This is paid by either or both of the parties to the transaction (they decide who pays, as part of their contract), and directly to the régulo (or to his deputy if the transaction does not warrant his presence or he is unavailable).

- How is such compensation calculated, and by whom? Is there any form of appeal?

There appears to be a single value per confirmation/approval, paid in the range of MZN 50 – 300. Appeal in real terms does not exist; this value appears to be fixed by the régulos and accepted by the communities. It is likely that a considerable degree of social control/reaction fixes and oversees the calculation of this cost.

- How can opportunity costs accruing to local land administration actors be compensated?
- Are potential users of the system, at association or individual member level, willing to pay nominal fees for transactions?

Yes. Community meetings indicated a willingness to pay “10 percent of the sale price” to the association for its services and the certificate. This would need to be discussed further and validate in follow-up meetings. Payment is made to the association, and the indications are that community members agree this payment should be split 50/50 between the régulo and the association.

- How can these payments be integrated into or adapted for new work flows?

A check box can be included to confirm that the requisite payment has been made.

Customary versus political/administrative validation

The fieldwork in Mozambique has shown that the role of traditional leaders supersedes that of politically appointed or recognized leaders, due to their long connections with the communities concerned. In the tradition of passing on information from one generation to the next, it is these traditional leaders who are the bearers of the institutional and land occupation memory of the community. They act as a form of supreme court or arbiter in cases of land conflict, and either in person or through their lower level sub-chiefs, their seal or signature on a declaration that a land transaction is valid is accepted by the community association as justification for then proceeding to map and certify a particular land right over a specific parcel.

A2.4.1 FILLING IN THE SIMPLIFIED MATRIX: MOZAMBIQUE

On this basis, the following list of basic processes has been developed (and incorporated in Table I in Section 4):

- The validation and legitimizing of new rights/changes in rights;
- Land transaction processes;
- Ceding of use rights (leasing and rentals);

- Management of commons (with reference to the CLUP developed through the delimitation process); and
- Rights of way (presented in the community meetings in terms of access to water).

In this context the question of validation and legitimacy is the key in all cases:

- The role of the traditional leaderships is paramount, as the holders of the verbal history of the community and the set of rules and customs regarding what is done in specific situations;
- Distinction is made between the traditional community leader and any “political” or “party” community leader;
- The traditional community leader is the key actor here, not the political one;
- In each of new rights, it is essential that the leader validates and, in a sense, “approves” the process underway and the new rights/divided rights that result;
- This process should be preceded by a contract and agreement between the parts involved (in other words neither the leader nor the community association get involved in the original negotiation over what is to be subdivided, what price is paid, etc.);
- At the point of validation by the leader some form of declaration is made which he or she signs;
- A payment is made to the leader at this point;
- The parties involved in the process are expected to provide a lunch with chicken or other animal and accompanying extras – this is not a payment to anyone but rather an event to recognize the efforts made and to celebrate the accord;
- The declaration and the original contract then go to the community association and on the basis of these documents the community association advances to carry out any survey work needed to issue new certificates;
- Payment is made to the community association for this – the community meetings talked of 10 percent of the value of the agreed transaction, which seems very high and needs to be discussed as these procedures are developed in practice); and
- As the traditional community leader has to sign the certificate, a share of the community association payment should go to him/her as well (the community meetings talked of a 50/50 split but again, this needs to be properly discussed and resolved when the procedures are put into practice).

ANNEX 3: ZAMBIA CASE

A3.1 ZAMBIA LEGAL AND POLICY CONTEXT

Zambia has a dual tenure system consisting of leasehold (statutory) and customary tenure. This duality has persisted since colonial times. The term of a leasehold is limited to a maximum of 99 years. Other lease terms include 14-year leases which are provisional, 30-year leases for resettlement schemes, and a 30-year occupancy license for housing improvement areas.

In Zambia, the division of the country into customary and state land within the Constitution and the definition of customary tenure and leasehold tenure in the 1995 Lands Act, creates a clear divide in the administration of land. Responsibilities under the Chiefs Act, as well as the Villages Act, provide formal recognition to the customary administration structures in Zambia though do not present specific guidance on how responsibilities are to be carried out.

The country is therefore clearly divided into state land under the administration of MLNR and its agents, as well as customary land under the administration of Zambia's 288 traditional chiefs. Land rights under customary land are subsequently administered through village headpersons, though specific traditions and approaches vary by tribe and chiefdom. Experiences with documentation differ among each of these areas, with some chiefdoms maintaining full registers and spatial information within a centralized body at the chief's palace, while individual households hold land certificates. Other chiefdoms provide letters of reference for new immigrants to the chiefdom and others lack any records at the chiefdom or household levels.

Despite the inconsistencies embedded in customary practices and periodic accusations of arbitrary displacements by some customary leaders, chiefs are widely seen as the custodians of the land on behalf of their subjects and possess the legal authority to manage these lands. Customary leaders are unlikely to relinquish this power in the near future, and attempts to separate these powers by the central government would result in large-scale destabilization of the country. A middle ground of locally managed documentation has increasingly emerged as a viable solution to the stalemate between customary leaders and the state over who should make land allocation decisions.

There is nothing in the law that precludes chiefs and village headpersons from documenting land or using the documentation to support conflict resolution, future allocation of land to internal or external stakeholders. In recent years, the chiefs have made it clear that they do not want their customary landholdings to be included in state-managed national titling processes, but that they would like assistance in undertaking local administration processes. Recent drafts of the National Land Policy recognize this opportunity and incorporate the concept of customary land documentation.

Yet, while the policy framework is open to customary land administration, there are no public resources presently available to pilot and roll out such a process and skill set. As a result, the sustainability of this activity is very closely related to ensuring local ownership of the process and a low cost and accessibility to support its long-term viability. Private sector companies, as well as CSOs, are testing fee-for-service approaches to documentation.

A3.2 ZAMBIA LAS

The National Land Titling Programme (NLTP) started in 2014 with the idea of placing all statutory land in Zambia on title at a reduced cost for its citizens. In 2013, MLNR set up the ZILMIS to provide secure, transparent, and traceable land transactions with the objective of developing an integrated GIS system that would enable access of information between the land register and cadastral information. The MLNR also developed the NSDI in 2014.

The number of registered leaseholds in ZILMIS is about 200,000 and pending registrations total about another 600,000 properties. Customary land in Zambia officially covers 94 percent of the country's area and is not included in ZILMIS. As noted above, chiefs have been clear that they would like support in undertaking local land administration processes but do not want their customary landholdings to be included in national titling processes administered by the government.

Customary land documents have been piloted in dozens of chiefdoms by a diversity of private sector, CSO and community-led initiatives. While there is increasing coherence in approaches and standards for the documents themselves, much less experience has emerged in administering the documents in a way that keeps the data up-to-date, encourages its use to resolve conflicts, and looks forward to unlocking investment in the land. Similar to the Mozambique process of establishing associations, though not as explicit in establishing new institutions, the Zambia approach sees value in empowering communities through community land governance principles that build on traditional structures of village action groups, chiefdom advisors (indunas) and the chief's own understanding of land governance and consistent application of good governance principles.

Sporadic projects initiated/financed by international donors, investors, and local governments for the paralegal titling of customary land have not changed the general picture. Such projects included the USAID-funded TGCC program in Eastern Province, which used an ODK-based application, and work by Medeem Zambia in 12 chiefdoms.

A3.2.1 MEDEEM ZAMBIA

Medeem Zambia is a company based in Lusaka which provides survey and crowd-sourcing services. The company has implemented projects in 12 chiefdoms with the issuance of 3,000 occupation right certificates for households, averaging 250 certificates per chiefdom. For the implementation of all projects, Medeem uses products developed by the company, namely Parcel Plan, Informal Settlements, ParcelEye, and ParcelSurveyor. Each product provides specific functionality for:

- Documenting survey and interviewing processes;
- Measurement of survey data in remote field environments, using Trimble equipment;
- Editing borders of surveyed parcels, communities; and
- Generation of occupation right certificates.

The technological platforms Medeem uses include Windows, and Esri ArcGIS with Geo Database; ParcelEye is an iOS based application.

The assessment made the following conclusions about Medeem:

- The toolkit of Medeem products looks fully functional covering all types of services provided by Medeem to the clients;
- Medeem products are loosely integrated – data processing assumes many manual operations for data exchange between the applications and for data post processing;
- Using the Trimble GeoExplorer 6000 (Figure 7) for surveying informal properties is not a cheap option, which can be a problem if mobilizing large field teams of dozens for parcel surveyors;
- Parcels are surveyed individually, parcel by parcel, with no shared borders for neighboring parcels, which leads to a high volume of post processing of field data at the office;

Figure 7: Trimble GeoExplorer 6000



- There appears to be no administrative system for Medeem’s properties; and
- Medeem has been focused on ad-hoc, spot data collection. While it could be relevant for technical support, their existing approach, focused on “on demand” registration, does not match the systematic certification approach as tested under TGCC, though their activities could be adapted.

A3.2.2 OPEN STREET MAP ZAMBIA

Open Street Map (OSM) Zambia²⁷ is an NGO with the primary objective of detailing the Zambia map with all possible information. There are many international donor organizations and projects financing such activities to have spatial infrastructure with required data. OSM Zambia is open to host any data that can be provided by ILRG that meets the OSM global standards. The biggest crowd-sourcing projects conducted in Zambia hired up to 500 field mappers and mapped more than 200,000 buildings in urban and peri-urban areas of Mufulira, Monze, and Lusaka. Some target area photographs were captured using drones. USAID has sponsored the development of two university chapters for youth mappers.

There is a procedure for remote data collection with quality assurance/quality control procedures. OSM tools include data collection, cleaning, analysis, visualization, and export. OpenMapKit, the kit for in-field OSM data collection, is based on ODK. There is an OSM plugin for QGIS. The major sponsors of OSM are Google and Facebook, which in return can use OSM maps in their applications. OSM data is not hosted in the country. Hosting of OSM servers is supported by Google, Microsoft, and Facebook.

OSM Zambia can be involved in crowd-sourcing projects with the mobilization of field teams and is open to host any country-related spatial data. OSM is not a relevant host organization, as it is most appropriate for data collection.

A3.2.3 MAST – ZAMBIA PROCESS OVERVIEW, PHASES, AND WORKFLOWS

The process of customary data collection used in Zambia under the previous TGCC program with issuance of the certificates can be grouped in seven phases:

- *Phase 1: Sensitization.* Training, information, and community awareness, team mobilization, training, community awareness; possible end of this phase is rejection of the activity by the community;
- *Phase 2: Establishment of workgroups.* Establishment of entity to work with the project (may be formal or informal, existing or new), meetings at village and community levels;
- *Phase 3: Community points and boundary delimitation.* Field intervention to capture community boundaries for registration of community boundaries;
- *Phase 4: Field demarcation and registration.* Field survey with collection of parties and parcels information, parcel layer created in the GIS;
- *Phase 5: Objections and corrections.* Publication period to collect objections and make correction in the parcels/parties records;
- *Phase 6: Certification.* Bulk issuance of certificates for households; and

²⁷ <http://osmzambia.org/>

- *Phase 7: Land use planning.* Development and generation of physical planning maps with partners.

A3.3 ZAMBIA FIELD WORK: BEHAVIORAL ISSUES IN RELATION TO NEW PHASES OF TGCC OR ALTERNATIVE LAS FOR COMMUNITY

Using the same set of questions/method as in Mozambique (Annex 2), ILRG held a series of discussions with customary leaders, headpersons and service providers through partners in Chipata and Petauke in early 2019.

Current customary practice and legitimacy

- What transactions do community land associations/traditional leaders/community members consider as most important in the local context and which need to be registered through the community-based cadaster?

All changes need to be registered through the community-based cadaster, but not all changes need to have approvals from the chief. All changes need to be registered, but do not necessarily need to have a certificate generated immediately. There needs to be a system at the community level that allows for transactions to be recorded, but that does not require costly/complex set of actions/workflows.

The most common form of transaction is the change of names on a certificate through inheritance or transfer. Currently, there are also a large number of first-time registration cases, where people or parcels were initially left out of the process either on purpose or accidentally.

Transactions that require spatial updates: Establishment of new parcels, revisions of boundaries; subdivision or joining of parcels. These generally require specialized expertise to modify and will have impact on other parcels.

Transactions that require updates to certificates but between “internal” actors: Inheritance, marriage, divorce, family transactions. These can largely be done on paper and updated periodically into the digital database.

Transactions that require changes of ownership between external actors and/or generation of new certificates: Exchange of parcels into a new extended family, or sale of land to people outside the chiefdom, or customary leaders taking parcels away from existing owners. These require approvals from actors who may not be immediately present in the communities.

Searches of records/reprinting of lost certificates: These require specialized skills but may not require full level of approvals from a broad range of stakeholders.

- How are these transactions validated and what is the basis of their legitimacy?

Validation comes through the engagement of a village headperson/area induna and is ultimately signed, approved, or recognized by the customary chief. Community members are comfortable with the presence of a land committee that has specialized skills associated with customary land management, and who act in an assistance role to the chief and headpersons to keep land information up to date. The challenge is establishing a structured communication among each of these institutions. While each chiefdom has a mechanism for communicating among these stakeholders, including weekly or monthly meetings at different levels, the integration of land issues is not always apparent. Land conflict will often be a point of discussion, but the basic transactions among individuals, occupation of land, etc. is not necessarily a point of engagement in these meetings.

- How are these transactions documented, and who holds this documentation?

Transactions between people within the chiefdom and outsiders must be approved by the chiefs, while transactions among people who are already within the chiefdom can be done by the headperson or area land committee on their own, providing the chief with information that it occurred. Transactions within families do not traditionally require any further approval outside of the family itself.

Documentation should be held by the household themselves, while a community register can hold the broader information. Transactions between families (both within and outside the chiefdom) should be documented and result in an updated certificate, while transactions within families would traditional not require any updates. The information, however, should be included in a village register and reach the broader chiefdom register for periodic update.

The challenge for recording internal family transactions while maintaining a mirror principle between the paper and digital records would be resolved by having:

1. Household certificates would have a paper addendum that can be updated with landholder and headperson approval. On this paper would exist the following information:

TABLE 8: CERTIFICATE ADDENDUM TEMPLATE

CHANGE TYPE	NAME/DETAILS	SIGNATURE OF LH/JLH	SIGNATURE ASSC/HP	REGISTER IN ASSC BOOK	DATE
Add / Delete					
Reason:					
Add / Delete					
Reason:					
Add / Delete					
Reason:					

2. The addendum is only approved with the signature of the headperson and association, but this would also imply that the update has been recorded customarily within the village register. This update would be associated with the following details in the village land register. Most relevant here is a confirmation that the records have been collected and entered into the digital database (as evidenced by “signature of digital upload”).

TABLE 9: CERTIFICATE ADDENDUM – VILLAGE LAND REGISTER DETAILS

VILLAGE	PARCEL #	CHANGE TYPE	NAME/ DETAILS	SIG. OF LH/JLH	SIG. OF ASSC	DATE OF ASSC	SIG. OF DIGITAL UPLOAD	DATE OF DIGITAL UPLOAD

- Is this documentation currently accessible and used in future (e.g. if there is a dispute or a change of ownership, can the original documentation be easily found and referred to)?

The status of what is the “real/definitive” document is not clear. For example, as things change at the local level and are not formally recorded at the level of the chief, do the records at the chiefdom level

become the reality or are the changes being made at the household/village level the reality? To date the records have not gotten out of date enough to test these issues, but the expectation is that the program should respect the certificate validity. The above procedures should resolve these issues.

- What is the reasoning behind their choice of transactions?

Transactions need to be defined based on the required actor/actions and their required follow up. These approaches seek to reduce costs.

- Are specific interests or sub-groups in the community being served? If so, what are they and are they compatible with the overall objectives of the ILRG program?

This approach on face value is not discriminatory though extra steps may need to be taken to ensure that women feel comfortable accessing the system and that people who moved to communities to access land have not lost access in their homelands. Youth and other actors who may not have yet acquired full customary rights need to be made to feel comfortable in their access to the system.

- What are the specific roles and responsibilities of key actors in current customary processes?

The roles of chiefs are clear, as are the roles of households and headpersons. The program needs to work more explicitly at the middle level of area advisors and village action groups to promote their role as information sources rather than bottlenecks.

- How are these key actors chosen/selected? Can they be removed and replaced?

The role of the chief in recognizing any of these actors is paramount. The biggest current danger has been the establishment of ad hoc land committees, which helped with the systematic documentation process, but may not yet have the legitimacy to stand on their own. Their relationship to more formal structures, such as the village action group, is a bit unclear.

- Are there any forms of accountability between these actors and their communities?

The use of traditional courts provides accountability between communities and their leaders. There is limited accountability with the chief and any of these institutions. The use of land data may create opportunities for accountability, by making clear which communities are engaging/active and which are not.

Costs

- What costs are involved in customary land management activities?

Costs are primarily related to travel, and mobilization of specialized skills for mapping services. Due to long distances there is a huge advantage to servicing multiple communities at once. This requires logistics and coordination.

- What if any compensation is currently paid by whom, to whom, and for what services?

ILRG is currently trying a fee-for-service model in three of the seven chiefdoms that it started working in. The challenge to date has been getting farmers to pay consistently and at the right time. This however is for first-time documentation. Internal family changes are unlikely to be of interest for payment, hence the above proposed low-cost method. Changes between families or for new arrivals can be monetized more easily and consistently.

- How is such compensation calculated, and by whom? Is there any form of appeal?

Calculation has been arbitrary to date, and ILRG will be supporting looking into this process.

- How can opportunity costs accruing to local land administration actors be compensated?

The role of a district service provider needs to be paid. Headpersons and village land committees may be paid for activities, but there is not a tradition of handing over funding to land committees for public use. This lack of tradition for communities to pay for development services will be a main barrier to adoption for this work.

- Are potential users of the system, at association or individual member level, willing to pay nominal fees for transactions?

Yes, users are willing to pay for transactions.

- How can these payments be integrated into or adapted for new work flows?

The primary issues at present is who pays and how can a single payment be targeted toward the wide range of stakeholders in different locations involved in the process.

Gender and the rights of women and vulnerable groups

- How do existing customary practices and behaviors affect and manage the rights of women and other vulnerable over land and natural resources?

Existing practices mediate how individuals access land as individuals and as families. Changing practices among matrilineal groups are seeing a newfound vulnerability for women and their children as they may not be accepted either in their area or their husband's area. Youth face some of the biggest barriers in this process, as they represent a large portion of the society, but have limited cultural access to land until they are married and sometimes until they inherit from parents.

- How should the community cadaster process be designed to ensure ease of physical and financial access by members of rural communities, considering possible barriers such as gender, marital status, age, and physical infirmity?

The cadaster itself will be gender and user neutral, however there are structural barriers to engagement and use of the data; for example, women are less likely to have national registration numbers, which are a prerequisite for accessing loans. The process to engage these stakeholders will have to be part of the initial outreach, but as well as engagement strategies, as opposed to changing the structure of the cadaster itself.

- How can the creation of a local maintenance cadaster improve/modify existing behaviors and practices without undermining its legitimacy and efficacy? (This is especially relevant in the context of gender and women's land rights) .

Local management of the cadaster is still a bit vague with the relationship between the community leadership and a service provider as uncertain. The goals of reducing costs and ensuring that communities take the leadership/ownership of the product is central to the theory of change. However, this transition is challenging unless existing customary leadership runs with the product. Fortunately, chiefs are keen on the tool and may be the best advocates for the process. It remains to be seen what their incentive structure will be for reaching their advisors (e.g. through positive incentives or fear/force).

- What measures can be put in place to address issues of inequality and discrimination with respect to the rights of women and other vulnerable groups?

As noted above, it is primarily about how stakeholders in associations/headpersons/groups are trained on updating the certificates and using the maps.

- How can new issues and challenges be addressed in the context of creating and maintaining a community-based cadaster?

Integrating or aligning each transaction type with administrative and policy frameworks from the beginning of engagement has been important. Periodic learning events between countries will be important to ensure that Zambia and Mozambique move at the same rate.

- Who are the institutions/persons that would need to be involved in validating their legitimacy on a case-by-case basis?

As above, validation can be acknowledgement or approval and we do not want to add new levels of bureaucracy/approvals to the system. The area committee structure is the most ambiguous at the moment in Zambia for their role and capacity to reach the full range of communities implicated in the work.

- What forms of evidence of such involvement would be considered acceptable?

For the most part, signature of household (man and women) and headperson/association will be the most relevant level of involvement, with a goal of not giving people authority who did not previously have authority.

ANNEX 4: PROPOSED WORKFLOWS AND BUSINESS PROCESS MODEL AND NOTATION (BPMN) QUICK REFERENCE GUIDE

Figure 8: First Registration and Parcel Mutation Workflow

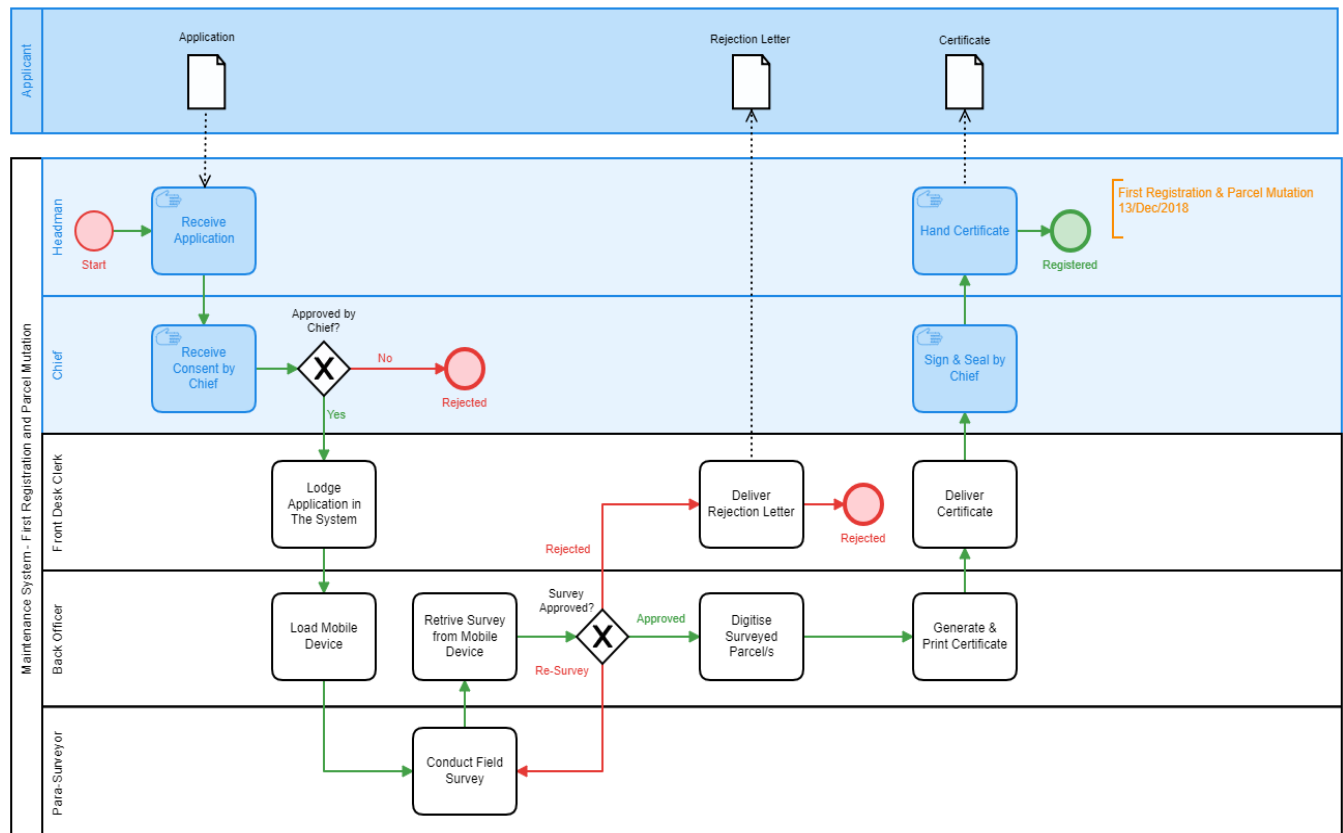


Figure 9: Subsequent Registration Workflow

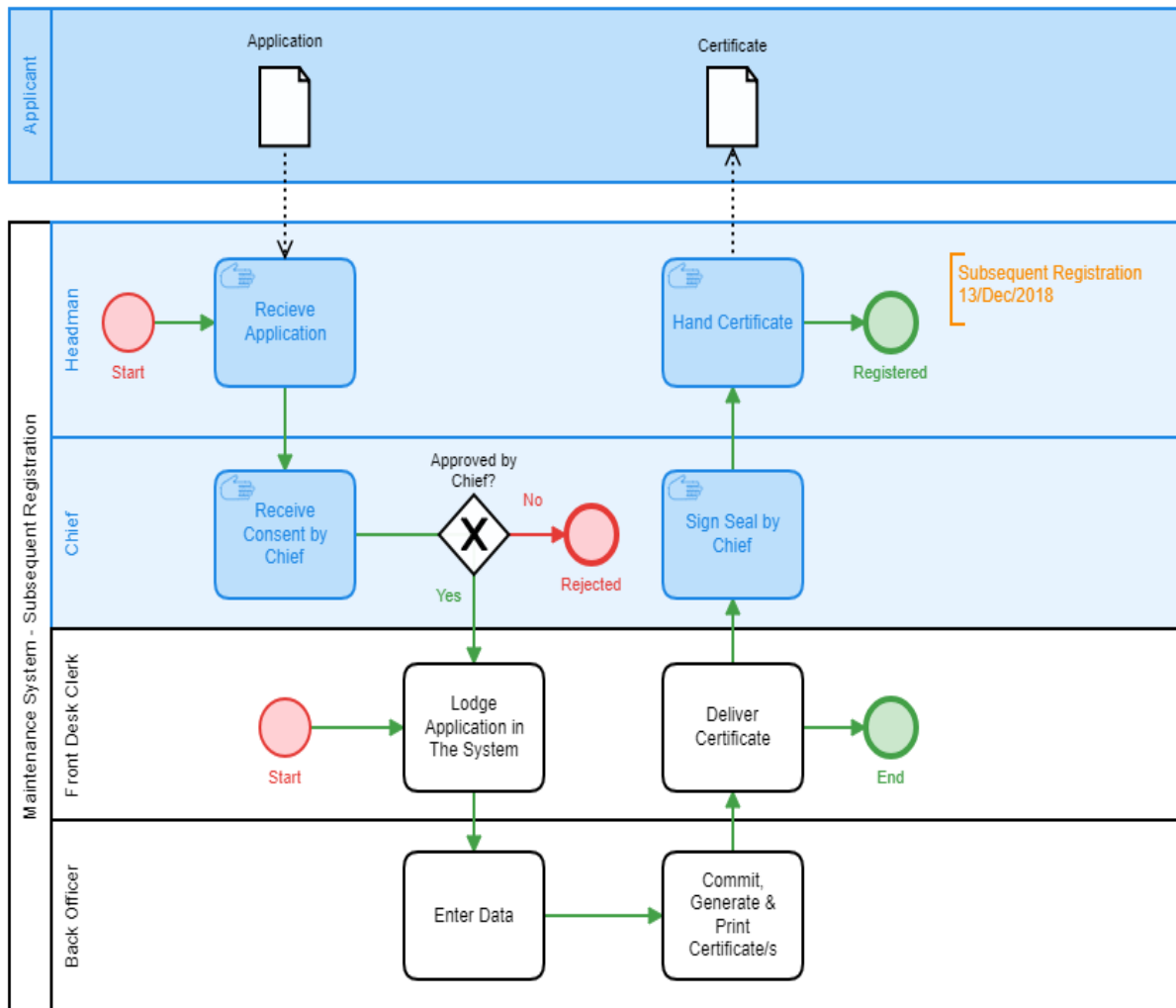


Figure 10: Cancellation of Certificate Workflow

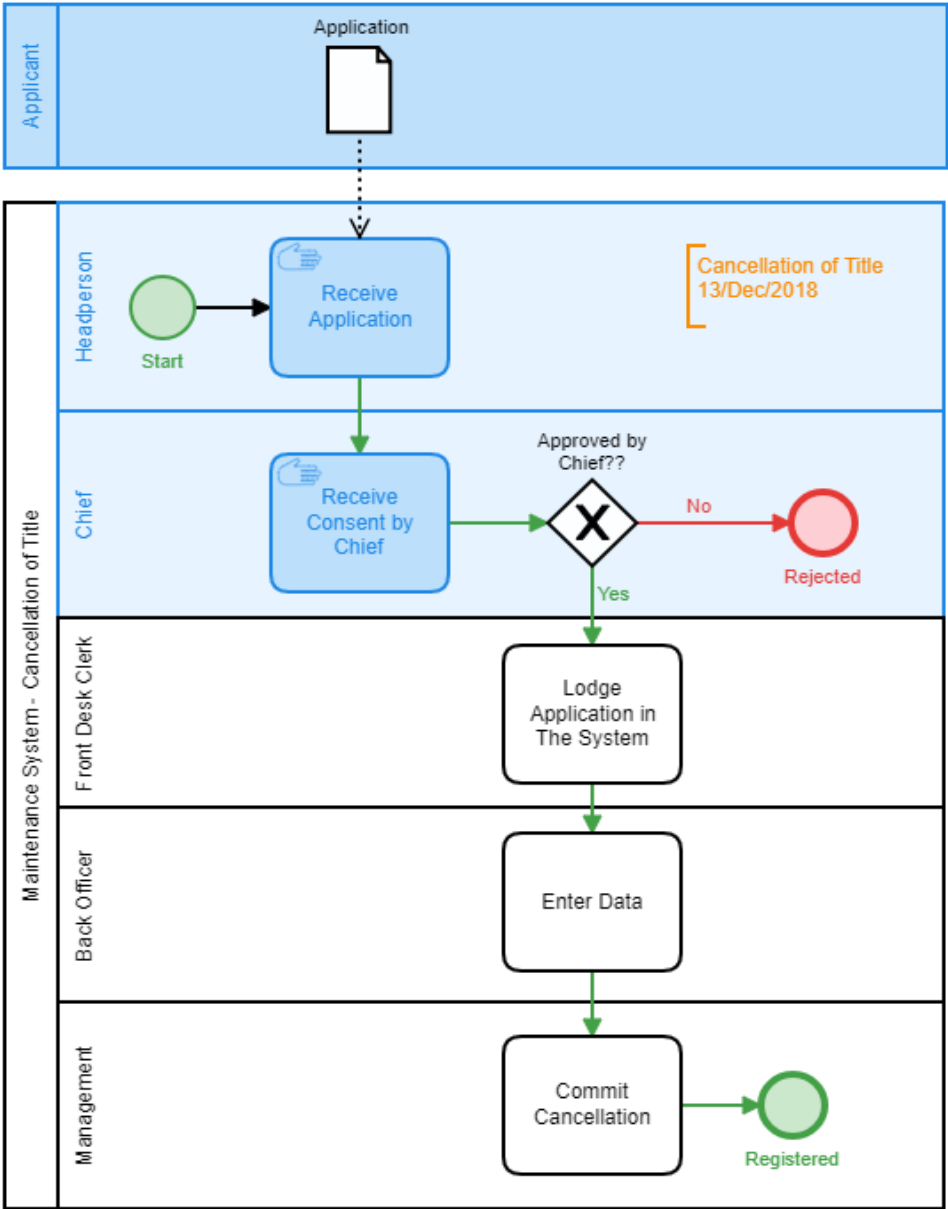


Figure 11: Search Workflow

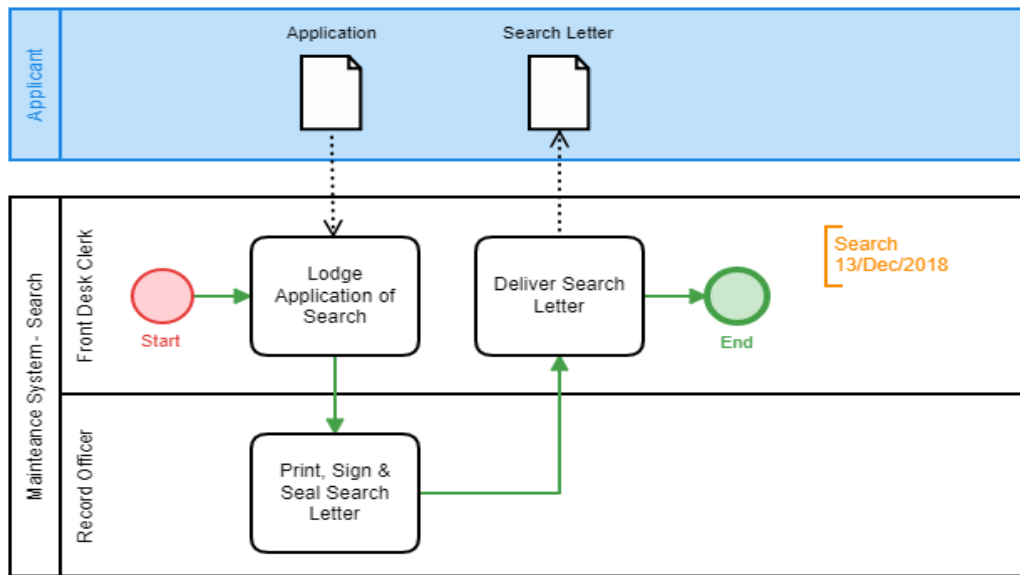


Figure 12: Data Correction Workflow

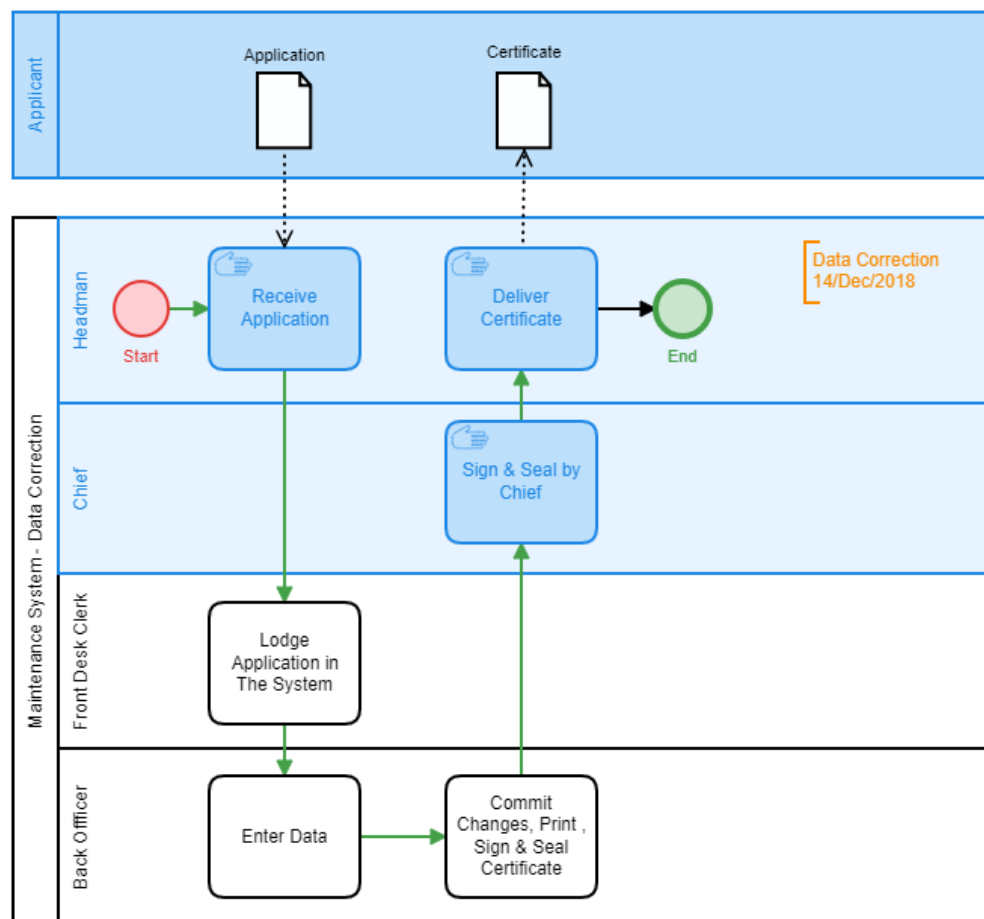


Figure 13: Lost Certificate Workflow

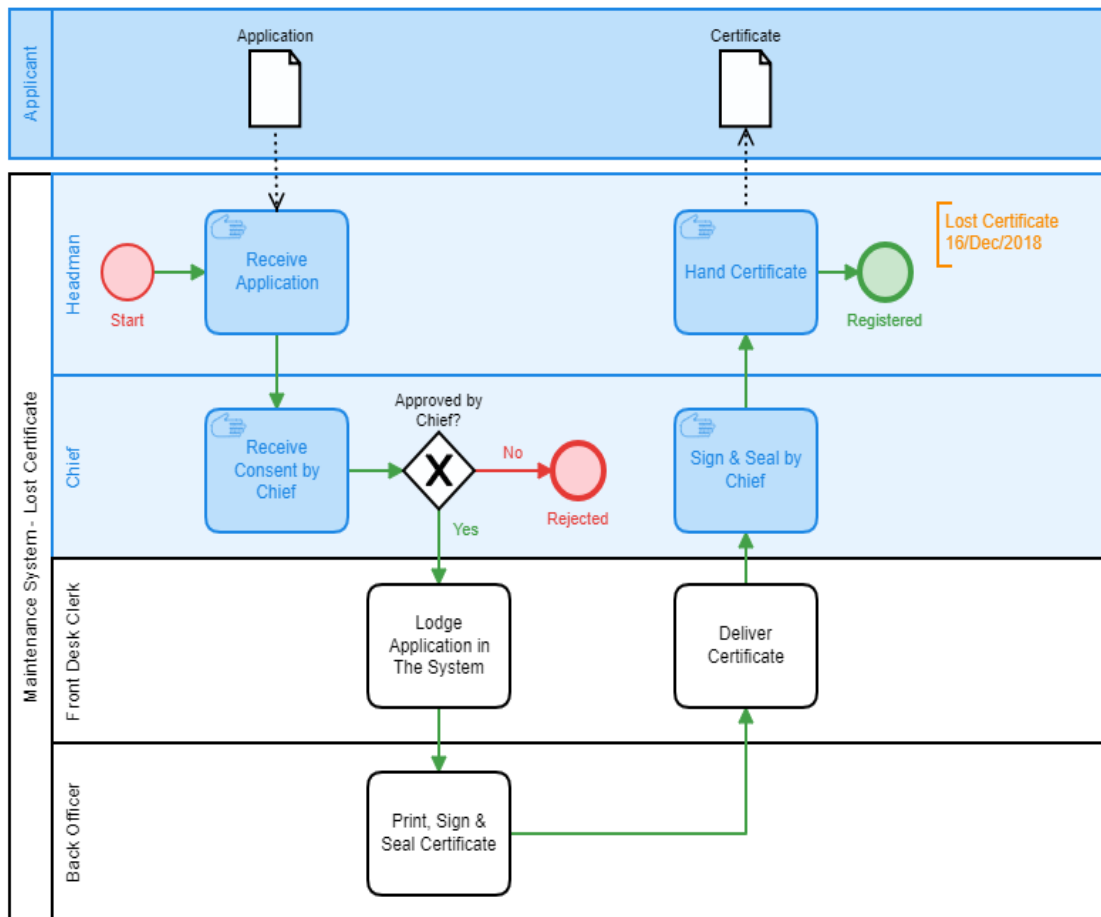
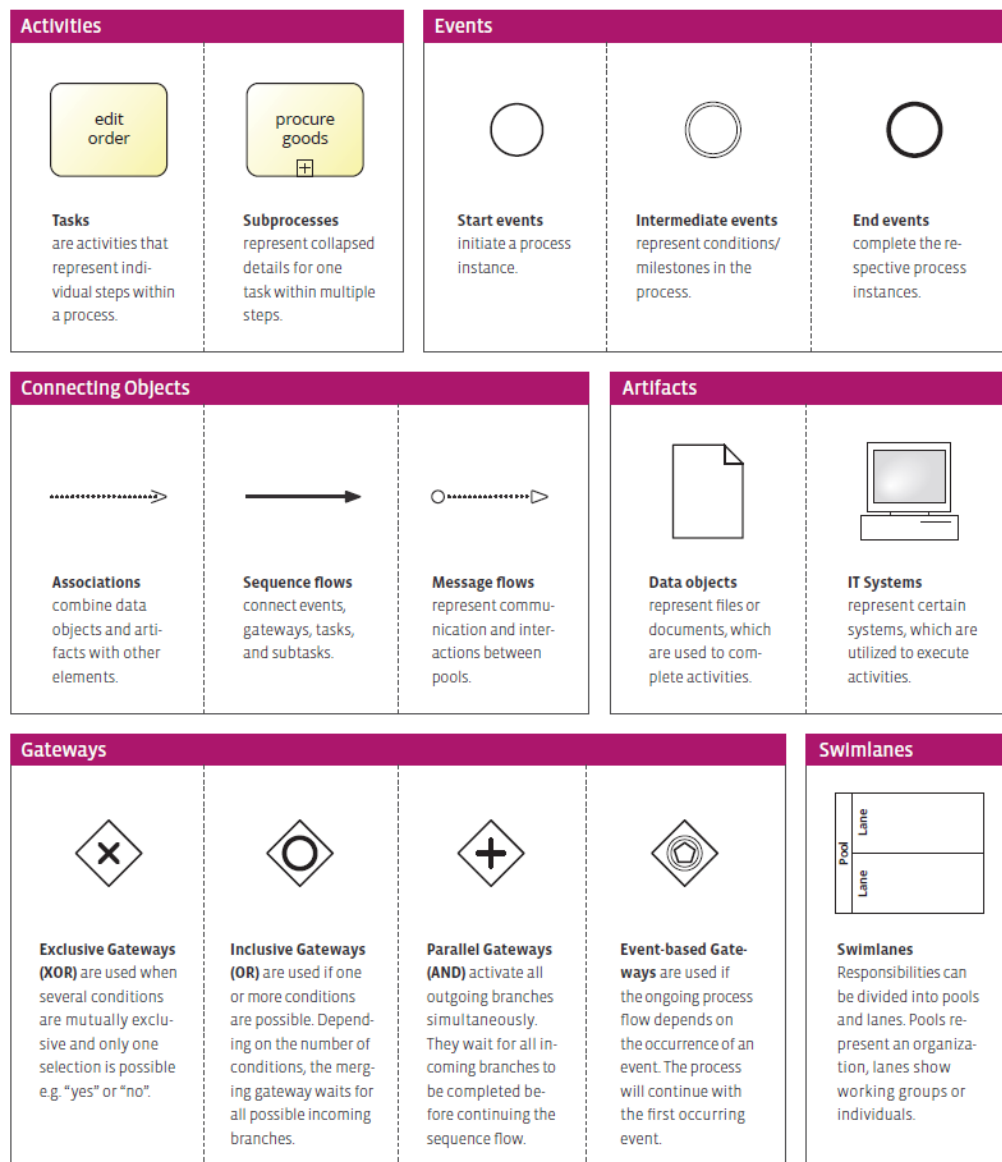


Figure 14: BPMN Quick Reference Guide



This diagram is from <https://www.signavio.com>. For more information about BPMN notation, see the *Introductory Guide* (<https://www.signavio.com/bpmn-introductory-guide/>).

ANNEX 5: TOTAL COST OF OWNERSHIP AND COST DRIVER CONSIDERATIONS

<https://digitalprinciples.org/resource/howto-calculate-total-cost-enterprise-software/>

TABLE 10: COST OF OWNERSHIP AND COST DRIVER CONSIDERATIONS

CATEGORY	COST DRIVER	CONSIDERATIONS
Management and staffing	Salary and travel expenses	<p>What is the level of effort of program management staff associated with training, vendor relationship management, and other meetings?</p> <p>Does capacity of community land administration host organization exist or will the organization need to hire and train new resources to manage the program?</p> <p>Is there an opportunity to build capacity with existing staff?</p>
Development and setup	Software licensing cost per environment and per user	<p>What is the licensing model? (open source, proprietary)</p> <p>What are the licensing costs and how will these change with scale?</p> <p>Is there a flat fee per number of users or individual fees per user or device?</p> <p>Is there a platform fee or costs to add users?</p>
	Software customization, including additional languages	<p>If you are working with a software vendor, what are the costs to add functionality and features now or in the future?</p> <p>If the software is open source, is there a responsive, established user community that will provide support and help add features at no cost?</p> <p>Does the community land administration host have skilled, available technical staff who can customize the software?</p> <p>What is the level of effort for technical staff to customize the software?</p> <p>What are the costs to contract with a consultant who is skilled and familiar with the software code to do the customizations? Is the consultant based locally?</p> <p>What are the costs to translate terms and develop the software in additional languages, if needed?</p>
	Software installation and configuration	<p>What is the level of effort for staff to install and configure the software? If elements of an existing system are being replaced, consider the time needed to uninstall a previous system and to transfer data from the old system to the new system.</p>
	Interoperability with other systems	<p>What is the cost to interoperate with existing tools and systems?</p> <p>What efforts will be needed to ensure that the system complies with relevant standards, including open standards?</p>
	Hardware	<p>Does the platform require servers?</p>

CATEGORY	COST DRIVER	CONSIDERATIONS
		Do users need devices? (feature phones, smartphones, tablets, GPS units)
Deployment	Cost and availability of data, connectivity, and power	What is the cost for the internet bandwidth or mobile data needed for the software to operate properly? Will the community land administration host need to equip its office with generators to ensure that the system remains running during power outages? Does the community land administration host need solar chargers, car chargers, or spare batteries for reliable device charging?
	Printing	What are the estimated costs of printing large scale maps?
	Training	Is there a fee for initial training? Are there travel and other logistical costs associated with training? Do you need to create new training and capacity building materials? How long are the trainings? How many people need to be trained? How frequently will you offer training to new users as the tool scales?
Operations	Voice and data services (mobile data plan, internet, number of text messages)	How many text messages and voice minutes will be used? How much mobile data will be needed for each user? Can you negotiate a below-market rate with a mobile network operator?
	Hardware maintenance, ongoing administration, and replacement rate of hardware	How often will you replace hardware? (typical replacement rate is approximately 20 to 25 percent per year) What are typical maintenance costs? How many staff members are needed for ongoing administration of hardware? What are their costs related to travel to project sites?
	Subscriptions	Is there a subscription fee? Are there costs to receive software updates or to access specific features?
	Software maintenance (fixing bugs, adding features, maintaining customizations)	Will you need to pay new license fees when you update to new software versions? Will volunteers from the open source community be able to do maintenance, or will you have to hire a developer? Consider that some updates may require additional development and testing. Will you get support from a vendor or program staff? Consider the budget implications of operations support for system crashes or to address software performance issues.
	Transfer of ownership	If ILRG staff are deploying the platform, how much staff time will be needed to transition ownership to the community land administration host? What capacity building will this require?

CATEGORY	COST DRIVER	CONSIDERATIONS
		Will licensing costs change due to an increase in number of users? Will the new owner need to procure new hardware?
	Refresher training and additional training activities	What is the staff attrition rate? How frequently will you provide refresher training? What other training activities and materials will you offer?

ANNEX 6: REFERENCES

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