



# Catalyzing Innovation

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## **AN INNOVATIVE, AFFORDABLE, AND DECENTRALIZED MODEL FOR LAND REGISTRATION AND ADMINISTRATION AT A NATIONAL SCALE IN TANZANIA**

**TRESSAN SULLIVAN, ALEX SOLOVOV, GILEAD MUSHAIJA, MALAKI MSIGWA,  
MUSTAPHA ISSA**

Feed the Future Tanzania Land Tenure Assistance (LTA)

Tressan\_Sullivan@dai.com

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## **Abstract**

This paper addresses issues related to scaling up a successful, innovative land registration pilot program using digital technology. Following the successful development of a process for a decentralised land administration system—driven by local land administration authorities using digital land data capture and management tools in Tanzania—this paper explores the potential for and challenges of implementing the system nationally. The paper proposes a low-cost, participatory, digital land use planning, registration, and management process. It examines the potential for a self-sustaining, decentralized, digital land management system for large-scale first land registration and ongoing administration of post-registration transactions. It is proposed that contributions by beneficiaries in conjunction with the involvement of the private and nongovernment organization (NGO) sectors can potentially deliver a self-sustaining system. The paper further examines challenges related to secure data storage and limiting opportunities for corruption.

## **Key Words:**

Community engagement; digital land information systems; land data capture; systematic land registration; Tanzania

## Introduction

This paper addresses issues around scaling up a village land registration pilot program using digital technology to the national level. The Feed the Future (FTF) Tanzania Land Tenure Assistance (LTA) Activity, funded by the United States Agency for International Development (USAID), operates in southwest Tanzania and has successfully demonstrated the use of digital land information systems for land use planning, systematic registration and post-registration transactions for village land.

Taking the program national will depend on meeting the challenges encountered during implementation such as village boundary rectification; land use planning that is a prerequisite to registration; keeping the costs low and community engagement high; ensuring there is adequate storage for paper documents and appropriate nationwide data storage; and safeguarding the integrity of the data.

LTA's stated aims are:

“... to clarify and document land ownership, support land use planning efforts, and increase local understanding of land use and land rights. It is anticipated that the interventions will reduce land tenure-related risks and lay the groundwork for sustainable agricultural investment for both smallholders and commercial investors throughout the corridor and in the value chains of focus for Tanzania's FTF program.” (USAID, 2015, p. 6)

“Local sustainability is a critical component of the LTA activity. The goal of this activity is to empower district and village land institutions in the districts targeted by the LTA to carry forward the capacity building and land administration process independently (and with little or no outside financial support or assistance) when LTA concludes.” (USAID, 2015, p. 7)

LTA operates in 36 villages in Iringa Rural District and five villages in Mbeya Rural District, and provides assistance to district, ward, and village authorities in the delivery of land tenure services under the Village Land Act, 1999; Village Land Regulations, 2001; the Registration of Documents Act, 1956; Registration of Documents Regulations, 1963; the Land Use Planning Act, 2007; and The Courts (Land Disputes Settlements) Act, 2002. Village land comprises approximately 70 percent of the land in Tanzania. Right of occupancy of village land is conveyed through a document called a Certificate of Customary Right of Occupancy (CCRO). The ultimate responsibility for registering village land rests with the Commissioner for Lands who is represented by an Assistant Zonal Commissioner for Lands and at the district level by an Authorized Land Officer. Tanzania is divided into eight zones for land administration purposes and has 133 districts. At village level, the Village Executive Officer, a government appointee, bears responsibility for land registration with the elected Village Council and with the approval of the Village Assembly (a meeting of all residents in the village).

Reserve land, which comprises game reserves, water bodies and national parks, occupies approximately 28 percent of land in Tanzania and is governed by various ministries including the Ministry of Natural Resources and Tourism, the Tanzanian National Road Agency, the Ministry of Water and Irrigation, the National Parks Board, and Ngorongoro Conservation Area through the Land Act No 4 of 1999. General land, which makes up approximately 2 percent of land, is neither village land nor reserve land and consists predominantly of urban land and titled farms and is regulated by the Land Act No. 4 of 1999. Occupancy of general and reserve land is conveyed through a document called a Certificate of Occupancy (CO) and reserve land through government notices. Although there has been some indication that the processes and digital land information systems used by LTA may be used in future for general land, this paper focuses on registration and post-registration transactions relating to village land only, as is the scope of work of LTA.

LTA uses an enhanced version of the Mobile Application to Secure Tenure (MAST) on smart phones operated by trained village residents called parasurveyors in a highly participatory systematic village land registration process that engages all members of the community. The residents demarcate and adjudicate land parcels and capture land data in the field.

LTA's experience in Tanzania has helped to identify and implement best practices to suit the context and has brought to light challenges encountered on a systematic registration program as well as the importance of, and the difficulties associated with, setting up a system to record post-registration transactions.

When applying the system nationally, it is important to note that a process of registering land parcels and augmenting registry offices alone, is not sufficient to bring long-term economic and social benefits or real change to the lives of beneficiaries. Unless land registration projects are implemented in a sustainable manner they will fail “to produce economic growth, facilitate credit, or provide the massive benefits that should come with the creation of formal property” (de Soto, 2001). Similarly, if first land registration projects do not take into account the need to keep the registries updated and provide a system for post-registration transactions, they “remain at best, limited and short-lived real estate inventories, ...‘snapshot’ books, useful for historical purposes only” (de Soto, 2001). If they do not focus on harnessing the involvement of financial institutions to provide loans to beneficiaries using the registered land as collateral, they fail to achieve their intended social and economic aims.

These considerations informed the progress of LTA and its implementation beyond the original aims of the project. LTA successfully demarcated 63,000 village land parcels by December 2018, using the MAST and registered more than 54,000 CCROs at an average cost of less than \$10 per CCRO, covering a

total land area of 291,762 acres (116,705 hectares). The cost to individuals to have a single parcel of land registered where no systematic land program is being implemented is in the order of \$100.

LTA developed the Technical Register Under Social Tenure (TRUST) for recording and registering post registration transactions. LTA strengthened the capacity of district and village land institutions and ensured that communities were fully engaged in the process and trained in land rights. In addition, LTA liaised with and linked banks to beneficiaries to respond to demand for loans using CCROs as collateral.

LTA is in the process of facilitating institutional reform in land administration at a national level. The Tanzanian Ministry of Lands, Housing, and Human Settlements Development (Ministry of Lands) has supported the project to the extent that it embarked on a process of reviewing and revising land administration regulations to bring them into line with LTA processes and procedures. The government has adopted MAST, TRUST, and LTA's processes as the preferred method for all future first registration and post-registration transactions, introducing a unified national land administration system. This is highly advantageous. If "each locality uses its own measurements and standards there is no compatibility on land data and hence no way to implement a national land registration" (Dekker, 2017). A national systematic registration process will not succeed unless "there is a system in place to accept the results of any mass registration programme and that the putting in place of a functional land administration infrastructure should proceed in parallel with the registration" (Baldwin et al., 2018).

### **Digital land information systems: Mobile Application to Secure Tenure (MAST)**

LTA adopted and adapted digital technology developed by the USAID Mobile Application to Secure Tenure (MAST) pilot project, which tested an approach for the mapping of land parcels, adjudication, and delivery of CCROs using an open source mobile application. In its original form MAST was limited to capturing land parcel boundaries and recording land information for producing CCROs including spatial data, claimant details (names, neighbors, land use, and ownership) to accommodate more formal procedures for land registration as per the Village Land Act No. 5 of 1999 and its regulations.

The upgraded version of MAST is able to capture more attribute data including claimants' proof of identity, disputes, and existing rights, which are all recorded and uploaded in the field. The introduction of a snapping tool automatically connects adjoining parcel boundaries and dispenses with overlaps or slivers of land between parcels, which commonly appeared with the original application. The data management interface (DMI) has been greatly enhanced for: automated registration and batch processing of CCROs and transaction sheets; producing maps for public display; generating statistical reports for monitoring and evaluation; and producing district and village land registration and issuance books. The

enhanced MAST accommodates the attachment of a land use plan as an overlay on the satellite imagery, which forms the base for demarcation of land parcels.

MAST is a user-friendly digital land information tool that facilitates the fast, accurate, and inexpensive registration of land and operates independently of mobile network coverage or access to the internet. Community members, who do not need to be particularly technically minded, are trained by LTA as parasurveyors to walk the boundaries of each land parcel in the company of village leaders and neighbors, and to capture the land data using GPS-enabled tablets or smartphones. MAST is an open source application accessible on [GitHub](#). The addition of a [Garmin Glo](#) blue-tooth receiver, which communicates with both GPS and GLONASS satellites, provides position accuracy to within one meter. LTA has used satellite imagery supplied by USAID. Satellite imagery sources, listed by [GISGeography](#) and other free to use sources such as [Google Earth](#) are not as accurate although have been suitable for the village land use planning process. Suitable imagery will need to be sourced for a national scale-up. Archived panchromatic imagery has proved accurate and cost effective enough at \$11.00 per square kilometer. Accuracy of data may also be improved by using new mobile devices with dual-frequency GNSS chips, such as [Xiaomi Mi 8](#), which claim accuracy within decimeters and are still user friendly and able to be operated by residents. The number of such devices will be increasing in the coming years, lowering the price and increasing quality. Even greater accuracy, within centimeters, can be achieved by more sophisticated devices, such as the [Emlid Reach RS](#) device, which may be suitable for the rectification of village boundaries or higher accuracy of land parcel surveying, as it can be integrated with MAST, but would need the operators to be technically competent.

In the LTA model, the data captured offline by the trained village residents on MAST is uploaded to a server on return from the field. Immediate transfer is also possible in places with mobile internet coverage, and in villages without appropriate cellular network coverage, offline data collection is employed. The uploaded data is accessible to the district land administration authorities at present, and in future can be integrated into a national land information system. LTA has coordinated with the Integrated Land Management Information System (ILMIS) project, funded by World Bank under the auspices of the Ministry of Lands, to ensure that MAST and TRUST are compatible with the national database being developed by the ILMIS team. ILMIS has confirmed that it can receive data for storage, back-up and remote data access.

LTA uses MAST to streamline and reduce the costs of village land use planning, a prerequisite to registration of CCROs, while maintaining a high level of community engagement. MAST is able to record the boundaries that demarcate different land use zones and assists in the production of mapping for accurate public displays of proposed Village Land Use Plans (VLUPs) for scrutiny and approval by the

public and for enforcement by village authorities after approval. Similarly LTA has used MAST to demarcate areas and land parcels in villages that are densely populated and require Detailed Village Settlement Plans (DVSPs).

### **Digital land information systems: Technical Register Under Social Tenure (TRUST)**

LTA developed an application for the digital administration of post-registration transactions in the form of the TRUST to ensure that “all the property records (titles, deeds, securities, and contracts that describe the economically significant aspects of assets) are continually tracked and protected as they travel through time and space” (Gramm & de Soto, 2018). TRUST was developed as a web-based application with a user-friendly interface and fully built on open-source technologies. As technology built for long-term use and adaptability, TRUST is based on the Land Administration Domain Model (ISO 19152) with flexibility to accept or feed data to or from MAST and potentially integrate with other land information systems, implementing LADM model. TRUST was developed as an open-source solution so as to avoid licensing fees and to allow for easy updates and maintenance, reducing the system’s cost of ownership and, like MAST, TRUST will be available on GitHub. TRUST allows for important transactional functions that were not available in MAST, including transferring rights of occupation; splitting or merging parcels; registering and discharging mortgages; searching land history digitally; and storing any relevant documents in electronic form. A number of business rules developed for the system prevents errors and keeps land rights records comprehensive, consistent, and up to date.

The successful implementation of a land registration process is not of long-term value unless future transactions are protected. The benefit of streamlining post-registration transaction processes, using digital recordkeeping and lowering the cost of post-registration transactions is that the registry will remain current and owners, after subsequent transactions are less likely to “slip off the register” (de Soto, 2001), as is currently the case. LTA has found that village leaders, whose role it is to oversee post-registration transactions, are not well versed in the post-registration transaction processes and without an easily accessible system, the default is to revert to informal agreements executed with the assistance of the Village Executive Officer but never communicated to the District Land Office for registration. It is not sufficient to provide the technical means to process post-registration transactions without ensuring that capacity to use the tool is strengthened at all levels, that the process is simple, and that the costs to the user are not prohibitive.

The fees charged for post-registration transactions have proved to be limiting. The current prescribed fees for registering mortgages are excessively high at \$100 per mortgage. The Ministry of Lands’ Task Force has recognized this as an issue and has proposed that no fee be levied for registration and discharge of mortgages to encourage registration and increase the potential for financial institutions to provide credit to

landholders. The Task Force has also recommended streamlining of processes to make them easy to follow and not too costly, with travel to district centers reduced to a minimum, and training of village leaders to ensure ongoing use of the system. A real challenge arises here as, unlike systematic registration, post-registration transactions are singular and require individual attention and execution raising the costs and time involved.

### **Land administration legislation**

In Tanzania there is longstanding legislation that governs the occupation of village land administered by Village Executive Officers, Village Councils and the Village Assembly whose role it is to ratify any allocation of land in the village. There are legislative guidelines for how village land is to be registered. Despite the laws and regulations, formal registration of occupancy rights to village land in Tanzania remains very low with individuals or institutions applying for CCROs on an ad hoc basis and covering the costs of survey and land use planning as required. Spot registration fees are approximately \$108 per CCRO. It is estimated that only 5 percent of village land has been registered, not because the framework did not exist for formal recognition of occupation of village land, but because the process is costly and cumbersome.

The right to occupy village land in Tanzania is governed by the Village Land Act, No. 5 of 1999. The Act entrenches the National Land Policy, which recognizes that all land in Tanzania is public land vested in the President as trustee on behalf of all citizens. Part II section 3 of the Village Land Act, 1999, sets out the National Land Policy of 1995, including the following:

- to make sure that there is established an independent, expeditious, and just system for adjudication of land disputes, which will hear and determine land disputes without undue delay;
- to ensure that existing rights in, and recognized longstanding occupation or use of land, are clarified and secured by the law;
- to facilitate an equitable distribution of, and access to, land by all citizens;
- to regulate the amount of land that any one person or corporate body may occupy or use;
- to provide for an efficient, effective, economical, and transparent system of land administration;
- to enable all citizens to participate in decision-making connected with their occupation or use of land;
- to set out rules of land law in an accessible manner that can be readily understood by all citizens;
- to establish an independent, expeditious, and just system for the adjudication of land disputes that will hear and determine cases without undue delay; and



- to encourage the dissemination of information about land administration and land law as provided for by this Act through programs of public and adult education, using all forms of media.

Subsection 3 (2) of the Village Land Act, 1999, provides as follows:

- The right of every woman to acquire, hold, use, and deal with land shall to the same extent and subject to the same restriction be treated as the right of any man, is hereby declared to be law.

It is in light of national land policy that LTA approached the systematic adjudication and demarcation of village land, and preparation and registration of CCROs. LTA acknowledged the land administration system that operates in villages in Tanzania and provided an opportunity to enhance that system, strengthening the capacity of District Land Officers, village leaders, and villagers to execute the system efficiently using easily accessible, cost-effective digital land information tools.

In accordance with the Village Land Act, 1999, and the Village Land Regulations, 2002, CCROs may be granted by village authorities under certain conditions and can be registered in accordance with the Registration of Documents Act, 1924, and the Registration of Documents Regulations, 1963. The Village Land Act, 1999, provides for the resolution of disputes at village level and The Courts (Land Disputes Settlements) Act, 2002, sets out the dispute resolution process if disputes cannot be resolved at first instance. CCROs can only be granted, however, if the village has a valid Village Land Certificate (VLC) showing its boundaries and after a Village Land Use Plan (VLUP) has been prepared and approved in accordance with the Land Use Planning Act, 2007.

Although these are clearly stated prerequisites for the granting of CCROs, the allocation of land has continued with the approval of village leaders irrespective of the status of the VLC or VLUP. The absence of up-to-date land use planning has given rise to land occupation in areas better suited for other uses.

### **Village boundaries**

LTA encountered many cases where VLCs had not been not fully recognized and where village boundaries were unclear. In these cases there were residents who believed they lived in one village and found out later that their land fell outside the village boundary and technically under the administration of a neighboring village. This caused complications for registration and had the potential to foment inter-village disputes.

Between 2008 and 2010, village boundaries were hastily surveyed during an exercise to prepare VLCs throughout the country. Insufficient survey points were used to define accurate boundaries and the boundaries were drawn in straight lines, not taking natural topography that would typically form common boundaries for villages into account. As a result, most village boundaries as drawn on the maps accompanying VLCs do not accord with the actual village boundaries. Some land parcels, although

clearly in one village, either straddle the village boundary or fall completely in the area designated as the neighboring village. To resolve potential conflicts over village boundaries and to register these parcels, it is necessary to provide certainty and obtain clear agreement from adjoining villages about the boundary between the villages. Similarly, where the village adjoins general land or reserve land the accurate and agreed boundary needs to be clearly drawn and recorded. The cost of formally resurveying all village boundaries is prohibitive; this is a challenge that will need to be met when a national scale-up is considered.

A similar challenge is created when villages grow, as it is common for them to split into two. In these cases, the new boundaries have to be redefined and mapped, and the cost of formal survey is prohibitive. The government has placed a moratorium on the splitting of villages, but where the process is already advanced the split villages have to be recognized and formalized prior to proceeding with systematic village land registration as the leadership and administration of each portion of the split village is different. The split villages are operating de facto as two villages. The approval process for split villages in the past was provided by the Department of Local Government and treated as an administrative matter without reference to the Ministry of Lands. VLCs were not rectified and posed a challenge when a systematic land registration process was undertaken in these villages. The Ministry of Lands has intervened and prevented any further recognition of authority over split villages.

### **Village Land Use Plans (VLUPs) and Detailed Village Settlement Plans (DVSPs)**

Another challenge arises from the requirement that a Village Land Use Plan (VLUP) has to be prepared and approved in accordance with the Land Use Planning Act, 2007, prior to commencement of the systematic adjudication and registration of land in any village, and that Detailed Village Settlement Plans (DVSPs) are required in densely populated areas. LTA found that around 90 percent of villages did not have approved and up-to-date VLUPs. VLUPs are usually prepared by the National Land Use Planning Commission (NLUPC), which operates effectively as a private consultancy charging villages for its service. The NLUPC quoted LTA \$6,000 per VLUP which was beyond the budget for LTA.

LTA streamlined the VLUP preparation process to ensure that this prerequisite did not prevent progress of systematic land registration. Under the LTA model, village land use planning is done under the direction of the District Participatory Land Use Management (PLUM) Team, an interdisciplinary team of eight staff drawn from district departments such as community development, water department, forestry, agriculture, livestock, and District Land Officers. The LTA model entails the PLUM team undertaking directing, supervising, and providing technical advice in two villages simultaneously. In accordance with the Land Use Planning Act, 2007, a Participatory Rural Appraisal process is followed. A Village Land Use Management Committee (VLUMC) is elected to work with the PLUM Team to develop a VLUP that

demarcates broad land uses for grazing, agriculture, settlement, environmentally sensitive areas, and public spaces such as schools, churches, mosques, and markets. The VLUMC comprises of nine persons and not less than four members must be women. The committee is nominated by the Village Council and ratified by the Village Assembly. The completed VLUP has to be approved by the Village Assembly following which demarcation and adjudication can commence. VLUPs require the subsequent endorsement of the District Council, Ministry of Lands, and the National Land Use Planning Commission. In considering a national scale-up, the resources and capacity to undertake the preparation of VLUPs in approximately 90 percent of all villages will be considerable. Because land use plans are prerequisite to land registration, using a streamlined planning process, such as the one piloted by LTA, will need to be considered when the program is scaled up, and provision will need to be made to ensure that land use planning precedes systematic registration in each village.

### **Awareness training**

The success of the LTA pilot rests heavily on a consistent focus on community engagement and awareness. Without the full participation of every resident in the village the process would not have succeeded. The LTA village land registration process begins with an introduction of the program to the regional and district authorities, followed by an introduction to the relevant District Land Office (DLO) whose officials are trained and who participate fully in the implementation of the program. Ward leaders, village executive officers (VEOs), and village chairpersons (VCs) are trained to ensure the process is well understood and that they are able to adequately fulfil their roles and responsibilities during the implementation of the program and thereafter.

Work in each village begins with training for the Village Executive Officer, Village Council and the establishment of a VLUMC, Village Adjudication Committee (VAC), and Village Land Tribunal (VLT) where these committees are not yet established. According to the legislation each of the committees has to have at least 40 percent women as members. The Village Council nominates members to these committees who are elected at a village-wide Village Assembly meeting. The program is introduced to the Village Assembly and the residents are provided with training on rights and responsibilities related to village land and the land registration process. The residents' acceptance and approval of the program is sought.

Specialized awareness training is given to women and men so that women's rights to occupy land and rights to land flowing from inheritance are fully understood and implemented. Awareness training is provided to all women groups and small groups of residents at hamlet (*kitongoji* or neighborhood) level, to ensure that men and women have a thorough understanding of their rights and responsibilities, and of the legal framework underpinning the registration of village land. This provides each individual with

sufficient information to make an informed choice as to the type of occupancy he or she might choose to be recorded on the CCRO, and how to ensure that rights to land can be passed on to heirs. Occupancy can be single, joint, tenants in common, occupancy by a guardian on behalf of a minor child, or by a probate administrator while a deceased estate is being wound up, and ownership by institutions where an administrator is recorded. In order to further reinforce this information all secondary school children in schools serving villages covered by the program also receive awareness training on their rights and their parents' rights to land so that they can participate in the program and support their parents in the process. Awareness training is augmented by public information campaigns such as radio broadcasts, television coverage of events, and brochures informing people of their land rights and the rights of women to registered occupancy of land. LTA has achieved a 50/50 gender balance of unique claimants as a result of the strong emphasis on informing women and men of the rights of women to own land in Tanzania as entrenched in the legislation. However overall land occupation for women is only 36% of all land area registered.

In a large-scale implementation process, the temptation exists to reduce time and costs by reducing public engagement. It cannot be emphasized strongly enough that the benefits of well-informed and participating residents is key to a successful systematic registration program and should form the cornerstone of any future program.

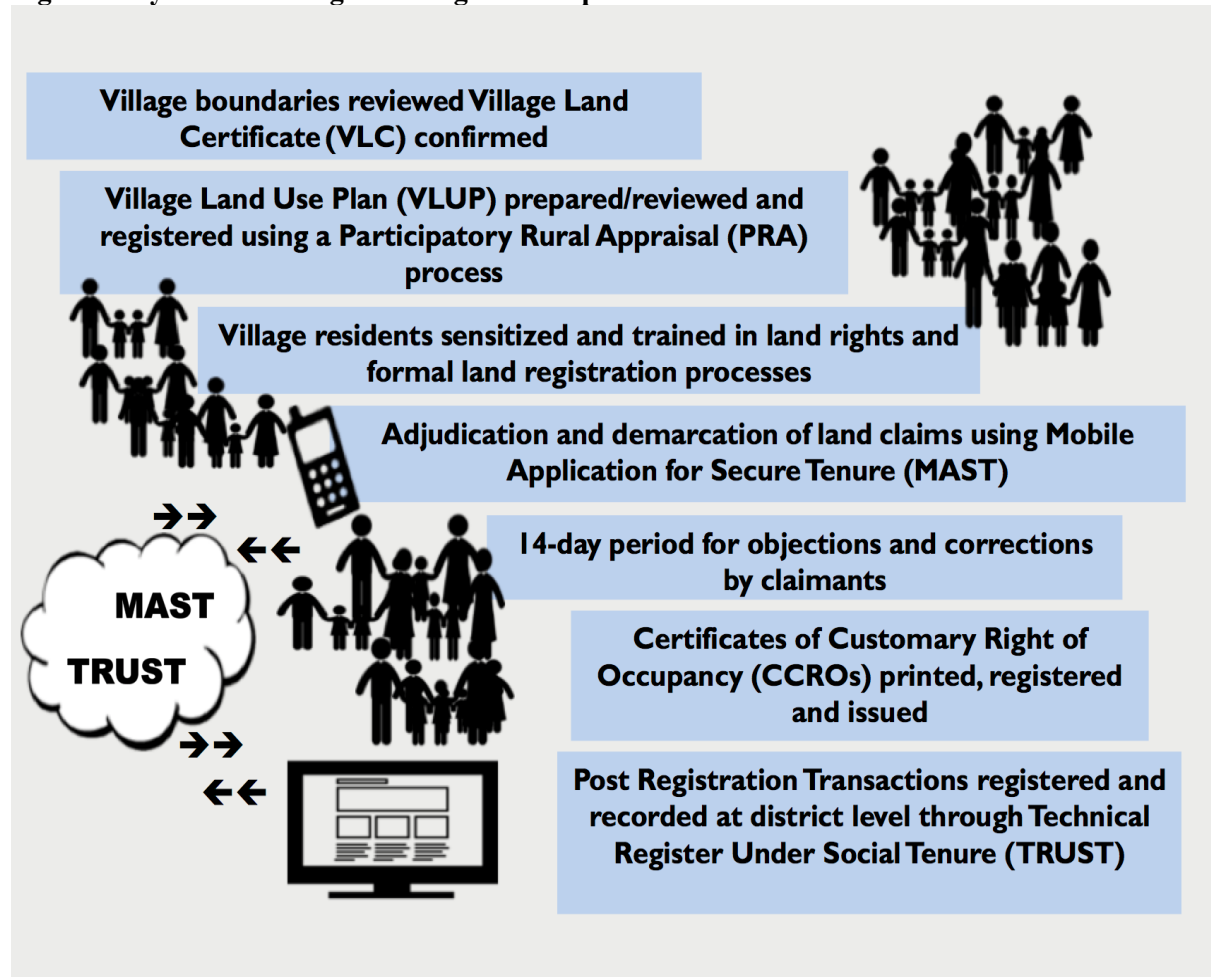
### **Adjudication and demarcation**

The village land registration process involves digital demarcation of land parcels using a participatory approach. As mentioned above, LTA trains parasurveyors and adjudicators selected from suitable applicants from the village to adjudicate and demarcate parcels by walking the boundaries of residential and agricultural parcels with residents and their neighbors and capturing the data on MAST. Members of the Village Adjudication Committee (VAC), accompanied by the hamlet leader, work alongside the parasurveyors to verify claims, confirm rights of occupancy, and resolve competing claims or boundary disputes. This fully participatory and transparent process has resulted in disputes relating to parcel boundaries being low, at 0.5 percent of total parcels demarcated on the LTA project.

LTA produces a map of all demarcated parcels using MAST that is posted in the Village Council office for residents to review. After a two-week period during which residents can check the demarcations as publicly displayed on maps and raise any objections, the data is finalized and the CCROs are registered and printed. A ceremony is held for the issuance of CCROs, which contributes greatly to the high CCRO collection rate of 89%. The resident receives one copy, the Village Council retains a copy in the Village Land Registry, and the District Land Office retains one copy in the District Land Registry. This has generated a need for secure physical space for storage at village and district levels.

Figure 1 illustrates the LTA systematic land registration process:

**Figure 1: Systematic village land registration process**



Source: Feed the Future/USAID Tanzania Land Tenure Assistance (LTA), 2019

### Uptake and acceptance of the process

LTA's process and the MAST and TRUST systems have been adopted by other agencies that are currently undertaking first land registration projects in other parts of Tanzania. The Land Tenure Support Program (LTSP) funded by DFID, SIDA, and DANIDA, has adopted MAST and LTA processes to demarcate approximately 269,000 parcels in 80 villages in Ulanga, Malinyi, and Kilombero districts in Morogoro Region and issued approximately 75,000 CCROs as at January, 2019 (LTSP Field Managers for Ulanga, Malinyi and Kilombero, personal communication, February 7, 2019). Ardhi University, the main land university in Tanzania, is planning to conduct land registration projects in five villages in Chalinze District and 16 villages in Iringa District. African Wildlife Foundation and Sustain Africa Program are working in five villages in the districts of Kilolo, Sumbawanga, and Kilombero. The Rural

Directorate of the Ministry of Lands has demarcated approximately 5,800 land parcels and issued approximately 4,500 CCROs in five villages in the Morogoro Region (personal communication Rural Directorate staff, January 22, 2019). PELUM, a Tanzanian nongovernmental organization, is working with the District Land Office to implement MAST in Mufindi District in Iringa Region.

The LTA land registration process facilitated by MAST and TRUST has been extremely well received by the Tanzanian land administration authorities at village, district, and national levels. The Ministry of Lands has adopted MAST and TRUST as the preferred digital land information system for first village land registration and for post-registration transactions in Tanzania respectively. The World Bank has confirmed its willingness to fund a large-scale systematic land registration program in Tanzania covering both rural and urban land with an estimated budget of \$75 million to \$100 million. There is mutual agreement between the Ministry of Lands and World Bank to use MAST as the digital land information system for registration of village land (personal communication Ministry of Lands official, February 14, 2019).

In response to LTA's progress, the Ministry of Lands set up a special task force to review and amend the legislation and regulations related to the registration of village land to fully adopt the digital registration process. The Ministry of Lands Task Force worked alongside LTA to review and revise all legislation relating to village land administration. The Ministry of Lands Task Force drafted guidelines proposing changes to the land legislation and regulations to accommodate the digital land registration and post-registration transaction processes proposed by LTA, a revision of the fee structure for registry transactions, and updating the prescribed training material for public awareness on land administration. The changes include amendments to prescribed forms and records and accepting scanned signatures from land administration authorities on registration documents. Prior to the introduction of streamlined processes as proposed by LTA, registering a CCRO required the physical transportation of documents three times back and forth from the District Land Office to the village for signatures from the landholder, the Village Executive Office, the Village Chairperson, the Village Adjudication Committee member, as well as the Authorized Land Officer back in the District Land Office. The acceptance of scanned signatures circumvented any transportation of the documents until the final delivery to the village of three copies, one for the landholder and one to be stored in the Village Registry Office one to be returned to the District Land Office after the landholder had signed all three copies.

Following the wholesale adoption of the system by the Tanzanian national government the conditions are ideal to scale up the systematic land registration process with the aim of a national rollout. The ultimate success in implementing large-scale land registration programs depends on "the political will of ... governments to move forward with comprehensive policy reforms" amongst others (Byamugisha, 2013).

A single national land administration system is desirable in all instances (Baldwin et al., 2018; Bennett, Rajabifard, Williamson, & Wallace, 2012). The Tanzanian government has adopted MAST and TRUST as part of a national model for land administration and the other preconditions mentioned by Byamugisha (2013) for successful scale-up are also present such as interest in agricultural investment and strong participation by the private sector, civil society, and development partners.

LTA’s work to date provides positive responses to the questions set out in the “Costing and Financing of Land Administration Services (CoFLAS) tool, a decision-support tool for the costing and project design of land administration services (Burns & Fairlie, 2018), indicating the readiness for a national scale-up in Tanzania.

**Table 1: Readiness for a national scale-up**

<b>CoFLAS tool questions</b>	<b>Summary of results</b>
<b>“Has the proposed systematic registration activity been piloted?”</b>	LTA pilot results are documented through reports. Cost estimates are based and cost analysis from the pilot. Needs and challenges have been identified. Necessary adjustments have been identified and proposed.
<b>“Is the systematic registration and/or conversion activity to be phased?”</b>	A district-by-district implementation process is proposed with work commencing in as many districts as possible simultaneously. A whole-of-district implementation is proposed to allow for village boundary issues to be resolved as work progresses from one adjacent village to the other and to enhance economies of scale. Training for District Land Offices to be done in zones (there are eight zones in Tanzania for land administrative purposes)
<b>“Are any changes to legislation necessary to undertake systematic registration...?”</b>	A specially mandated Ministry of Lands Task Force identified the land administration regulations that need to be amended and the Ministry of Lands is in the process of making the necessary amendments.
<b>Changes to legislation may include greater flexibility in survey standards (i.e. allowing demarcation on high-resolution satellite imagery and/or the use of community enumerators and dispute-resolution processes). Lower cost approaches include adjudication by local volunteers with few or no surveys (may require legislative change)."</b>	The amendments include: <ul style="list-style-type: none"> <li>• Flexibility on survey standards by accepting MAST on high-resolution satellite imagery for survey purposes.</li> <li>• Using community enumerators and adjudicators.</li> <li>• Reduced time frames and transaction fees.</li> <li>• The Ministry of Lands’ Task Force formally endorsed LTA’s mechanisms for saving costs and time when printing and registering CCROs, such as: using legal paper with the national logo printed at the top of the document in place of the embossed crest; printing CCROs in black ink; and accepting scanned signatures and name stamps.</li> <li>• Streamlined forms and records for easy execution at village level.</li> <li>• Public awareness training material amended to instruct</li> </ul>

	<ul style="list-style-type: none"> <li>residents on the systematic land registration processes.</li> <li>Acceptance of TRUST for post-registration transactions.</li> </ul>
<p><b>“Have time-based work plans been prepared for ... systematic registration activities?”</b></p>	<p>Time and costs from the pilot have been accurately recorded and analysed and one field team can demarcate approximately 1,200 land parcels per month. The estimation of costs below is independent of pace of implementation.</p>
<p><b>“What is the strategy to staff the systematic registration activity?”</b></p>	<p>A proposed staffing strategy has been prepared based on the LTA’s experience working alongside DLO and other district department staff members. Very few additional staff members are needed. See the preliminary estimation of staffing, equipment and space requirements below. Provision has been made for training hubs and monitoring, evaluation and learning.</p>

Source: “Costing and Financing of Land Administration Services (CoFLAS)” (Burns & Fairlie, 2018) and Feed the Future Tanzania Land Tenure Assistance (LTA), 2019

### **Decentralized nationally accepted digital land administration system**

LTA’s model demonstrates that it is possible to produce a local register system “that can be deployed at district or even village level that can be fully in line with national laws and regulations” (Baldwin et al., 2018). MAST facilitates a land administration system that is implemented by village residents under the supervision of the district authority and can be incorporated into the national Integrated Land Management Information System (ILMIS). There is agreement at the national level that MAST, TRUST, and LTA systems will be used in future systematic land registration programs and land administration regulations are being amended accordingly. Landholders and village leaders have embraced the system as a result of the concerted effort to focus on community awareness and participation. Uptake of CCROs issued by LTA is around 90 percent and requests for implementation in other villages and districts abound. LTA has become a training hub for other organizations and for district authorities in other districts where systematic land registration is being implemented. For the system to be implemented on a large scale successfully, the challenges encountered by LTA need to be addressed and “there need to be clear arrangements in place for system management and data security” (Baldwin et al., 2018).

The issues that warrant careful consideration in the anticipation of a scale-up include:

- Resolving village boundaries and VLC approvals.
- Ensuring VLUPs in all villages and DVSPs in densely populated areas are completed in time for systematic registration to follow and at a reasonable cost.



- That suitable satellite imagery can be obtained free or at low cost and appropriate equipment is used for demarcation.
- That data security and integrity is maintained and that the data can be stored at district level and migrated into the national land information system.
- That costs are affordable and innovative means are employed for reducing and meeting costs.
- That physical space is available for operationalizing the process and for storage of CCROs at village and district levels.
- That the awareness and capacity of village residents, village leaders, and district authorities are strengthened for systematic registration as well as ongoing post-registration transactions and VLUP enforcement.
- That financial institutions are involved from the outset to facilitate loans and release the value of the capital held in land by residents.

### **Meeting the village boundary challenges**

Inadequate records of VLCs and inaccurate village boundaries have required LTA to follow up to ensure that VLCs are properly approved and that village boundaries are reviewed. A process of systematically meeting with neighboring Village Councils to obtain agreement and clarify village boundaries has been required. This is a two-stage process. The first stage requires obtaining minuted agreements from adjoining villages, either accepting or rejecting the parcels claimed in the targeted village but falling within the stated boundary of the adjacent village. This is a sufficient mechanism to recognize amended boundaries and allow for the CCROs to be issued in accordance with the agreement. The second stage of the process would be to resurvey the boundaries and amend the maps attached to the respective VLCs. The costs of formal survey are prohibitive.

The Ministry of Lands accepts that rectified boundaries can be demarcated using MAST because the DLO surveyors use a hand-held GPS devices, which are no more accurate. If a higher level of accuracy is required, a cost-effective solution may be to survey the boundaries with a more sophisticated device, such as the [Emlid Reach RS](#) device, which is being marketed for \$799, can be operated by people without formal surveyor training, and is compatible with MAST and TRUST as it is capable of exporting in ESRI Shape file format. A similar process can be used for split villages where one VLC exists for two villages. If boundaries are agreed between the split villages the same flexible survey mechanism can be used to demarcate the village boundaries, rectify the VLC and prepare a new VLC for the section of the village that has split off.

## **Meeting the land use planning challenges**

It is estimated that approximately 90 percent of villages require Village Land Use Plans (VLUPs) and the costs of preparing VLUPs are inordinately high if commissioned through the National Land Use Planning Commission.

As an alternative LTA sought to pilot VLUP preparation in a more efficient and cost-effective manner and achieved this by using the district town planner and an eight-member PLUM team from the district to work simultaneously in two villages at a time. To further reduce costs the PLUM team split into two and facilitated the Participatory Rural Appraisal process with the VLUMCs in both villages and were flexible enough to switch teams to ensure that specialized skills were available where required.

The fieldwork needed to prepare the VLUP was completed in two weeks. Approval is required from the Village Assembly, which is the ultimate authority at village level and this is sufficient approval for systematic registration to commence. The alternative VLUP preparation process reduced the costs to \$1,800 per VLUP as opposed to \$6,000 quoted by the National Land Use Planning Commission (NLUPC). It is possible for the PLUM team to do more than two villages at a time and it is desirable to undertake planning on a landscape basis where villages that share the same landscape, topography, and natural features are planned as a unit. This would reduce the costs further. It has become apparent that Village Councils are weak in the enforcement of VLUP bylaws. This needs to be strengthened and village leaders need training. LTA is considering strategies to bolster enforcement such as radio programs and training programs to all villages. The training hubs proposed in the national scale-up would be tasked with ensuring that this training is done.

Areas that are densely populated in villages or areas designated as planning areas (future urban areas) are required to have a Detailed Village Settlement Plan (DVSP) prepared in advance of systematic registration. The National Land Use Planning Commission (NLUPC) is usually responsible for preparing DVSPs but charges for the service. The cost that the NLUPC quoted for preparing DVSPs was \$12,000 per DVSP. LTA piloted an alternative process using the services of the district town planner and reduced the cost to approximately \$3,500 per DVSP. The process entailed adjudicating and demarcating all parcels up front in a village, including those in the DVSP area as identified by DLO. The DVSP area was then marked out using MAST. The parcels that were demarcated within the DVSP area formed the framework for detailed planning. The planners designed the detailed plan in such a way as to minimize negative impact on existing landholders but at the same time to ensure that sufficient public space is set aside for commercial use and public facilities such as roads, schools, football fields, and dispensaries. CCROs were not issued until the DVSP was completed. The CCROs in DVSP areas will have the bylaws generated from the DVSP attached to endorse the proposed land use for each parcel. If a land parcel has

been designated in the DVSP for subdivision into additional private residential parcels for the purpose of densification, it will be the responsibility of the CCRO holder to cover the subdivision costs in future. In the event that the land is identified for public use, the authority responsible for the development of this public facility will be responsible to follow normal expropriation and compensation procedures when it wants to use the land for the designated purpose. As there is no funding available for government to compensate people for land that is expropriated to give effect to a DVSP, it has been necessary to embark on lengthy negotiations with residents whose land was required for immediate public use, such as road reserves, to be compensated by some other means.

### **Sourcing suitable satellite imagery and accurate demarcating devices**

The availability of satellite imagery for mapping and demarcation needs to be resolved if registration is to continue on a large scale. Commercially available current satellite imagery is expensive. While Google Earth (<https://earth.google.com/web/>) is suitable for VLUP planning it is not accurate enough for demarcation and adjudication through MAST. The availability of open source satellite imagery (GISGeography, 2019) has been explored however the resolution available (10m) is unlikely to meet the requirements of MAST and TRUST. The most effective solution at this stage is to use archived panchromatic imagery, which is far less expensive than current imagery at \$11.00 per square kilometre, and the fact that it may be a few years old does not impact significantly on fieldwork.

### **Data Security and Integrity**

The type of system chosen for digital data storage has significant implications for cost, reliability, and long-term sustainability. Currently the data created through LTA is stored on a local server and is maintained by the project. Access is restricted and privacy maintained. On a large-scale project such as a national rollout, care must be taken to ensure reliability, privacy, and sustainability of the system. Efforts to prevent fraud and corruption have been built into the system, however, the system cannot prevent false entries by authorized officials.

Digital records of CCROs issued by LTA were initially stored on [Amazon Cloud](#), which proved costly and ultimately would not be sustainable by DLOs. The alternative approach has been to store data on the server and back it up on an external hard drive as well as free to use [Google Drive](#) on a weekly basis. Google Drive can accommodate the data as it is uploaded without the imagery and the files are small enough to be saved for free.

An alternative option that needs to be tested would be to make use of national government servers, which are connected through fibre optic cable. The national ILMIS is compatible with MAST and TRUST and can receive data for storage and backup initially and eventually function as an active national server for

all districts. In the case of a national scale-up, as systematic registration progresses, so the data would be uploaded. The idea would be to retain decentralized registries at district level, operated, and maintained by the DLO, however with national storage and backup.

For some time, distributed ledger technology, or blockchain, has been proposed as a secure option for land registries (Vos, Lemmen, & Beentjes, 2017). Blockchain technology has been promoted ‘for addressing insecurity, corruption, and misuse in the field of land registration’(Kshetri, 2017). In July 2018, a new initiative, called Barking Dog, was announced as a program using blockchain to increase land registration in Africa and the rest of the world (Tai, 2018). At the same time, Ghana announced that IBM will work with the Ministry of Lands and Natural Resources to develop a white paper on the use of blockchain technology to ‘modernize and build a computerized, immutable, and verifiable land registry’ (Unknown, 2018). This follows other initiatives in Africa such as the Ghana-based [Bitland](#) and Kenya-based [Land Layby](#) digital land administration projects (del Castillo, 2018). Alongside the optimists are those who suggest ‘looking at blockchain technology as a tool like other technologies with its benefits and pitfalls’(Zwitter & Boisse-Despiaux, 2018) and not as an ultimate solution.

Blockchain may well be an option for secure storage but, “(t)he real challenge ... will probably be the initial identification of right holders and the creation of actual titles. Once it is known who is the actual owner of a certain parcel, the ownership of the parcel can be transferred. This initial phase will not be realized by using blockchain” (Vos et al., 2017). It could be argued that rather than looking to blockchain, the digital solutions tried and tested by LTA are adequate for the initial registration of rights through MAST and the recording of post-registration transactions through TRUST. The question is ‘whether ‘distributed trust’ in the blockchain is or will be the same as legal certainty in a well-functioning land administration system’ (Vos, 2017).

There have been no assessments to date of successful implementation of distributed ledger systems for land registration in Africa and until such time as they are fully developed, options such as those proposed in this paper will have to suffice. It is important to note however that Tanzania, and Africa in general, is well placed to adopt this technology when it arrives. As Keenan (2018) suggests, “Africa also has a significant advantage over other continents: With few legacy systems in place (and few legacy stakeholders to interfere), African innovators have an opportunity to leapfrog over outdated technologies and jump straight to whatever will come next.”

### **Staffing, Physical Space, and Equipment**

Based on a desk exercise and anecdotal evidence from LTA’s engagement with District Land Offices (DLOs), LTA has developed a model for the staffing, space, and equipment requirements for a DLO in a

district with approximately 100 villages and an average of 1,500 parcels per village to effectively operationalize a systematic registration program for the whole district. The staff positions listed are not additional to the usual staffing compliment, except where specifically noted. The district administration pays the salaries of DLO staff and their basic salaries are not be factored into the cost estimates. Fieldwork, undertaken by DLO staff in implementing the systematic land registration program, was funded by LTA during the pilot and these costs are included in the cost estimates. LTA also remunerated village residents who participated as adjudicators and parasurveyors and these costs are also included.

The estimated staff requirements for a DLO office are the Head of Department—Lead for Lands, Town Planning, Surveying and Valuation, Authorized Land Officer (Land Administration), and four Land Officers/Assistant Land Officers, a secretary/filing clerk, and a receptionist/filing clerk, District Town Planner and two town planners, District Surveyor, one land surveyor, and five cartographers/GIS, and a District Valuator and one valuator. These staff members will undertake the systematic registration program as part of performing their normal duties and are paid by the district administration. For the purposes of fieldwork, awareness training and demarcation, four DLO staff members are needed. When DLO staff members are required under the proposed model to undertake fieldwork to supervise or assist in awareness training or adjudication and demarcation, they are remunerated for the work per diem based on the standard government scale. For the purposes of completing VLUPs and DVSPs two Town Planners and four PLUM team members drawn from DLO are required, namely: one Land Surveyor, one Land Officer, one Town Planner, and one Cartographer/GIS Specialist. Four members from other district departments namely: one Agricultural Officer, one Forestry Officer, one Community Development Officer, and one Livestock Officer join the DLO members to create a team of eight who are also remunerated per diem. Other district specialists can be drawn upon for particular issues, for example water affairs, where there are sensitive wetland areas. Four Community Development Officers from the district and ward levels of the Department of Community Development will support DLO staff and receive per diem remuneration. For the purpose of registering CCROs an additional eight staff members are required who can be drawn from other district departments, casual employees or interns. While attending to printing and registration, these staff members also get per diem payments. The services of the District Land Surveyor and Cartographers will be required to verify and rectify boundaries. All per diem payments are included in the \$10 cost of CCROs, as are the per diem payments for village residents undertaking training, and work associated with the preparation of VLUPs and adjudication and demarcation.

The estimated physical space requirements for a typical DLO office with the staff as set out above would comprise of a reception area, a secretary's office, the Head of Department's office, the Authorized Land

Officer's office, the District Surveyor's/GIS office, Town Planner's office, District Valuers office, and District Land Registry. The additional space required for a district-wide registration program would be a large office to be used by the registration and printing team for processing CCROs, and a suitable secure space to store 200,000 CCRO files, to accommodate subdivisions and future transactions. Storage space is a challenge. LTA found that neither the DLOs nor the villages had adequate or sufficiently secure space for storage of CCROs and included rehabilitation of buildings and supply of lockable filing cabinets for this purpose. Based on 10m<sup>2</sup> per person (Burns & Fairlie, 2018), the estimated space requirement for a DLO would be 240m<sup>2</sup> (general workspace), 20m<sup>2</sup> for reception, 40m<sup>2</sup> for CCRO production and 100m<sup>2</sup> for storage, totalling approximately 400m<sup>2</sup>. DLOs do not have sufficient space to accommodate the storage or the CCRO production and providing this additional space would need to be factored into the national scale-up costs. Provision also needs to be made for provision of a secure space at village level for the Village Land Registry, and the supply of office furniture and lockable cabinets.

The additional office equipment that would be required to augment a typical DLO includes: four desktop computers; plus one computer designated solely as a server for MAST and TRUST with a reliable internet connection; tables/desks and chairs for additional staff; a registration table for processing CCROs; four office cabinets; file racks; one black-and-white, heavy-duty A3/A4 printer; 32 tablets or smartphones; 32 power banks; 32 Garmin Glo GPS devices; and 32 USBs, stamps, and seals. Ongoing office expenses include the provision of stationery, ink cartridges and legal paper. Vehicles are difficult to source through the district administration vehicle pool and outsourcing of transportation services is recommended. Transport costs are built into the costs of CCROs and VLUPs and are reflected in Component B. It is also recommended that the printing of large maps, for VLUPs and the objections and corrections process, is outsourced wherever possible to obviate the need for purchasing an A0 plotter. The alternative is to print the images at A3 size on a black-and-white printer and paste them together.

### **Costs of a national scale-up**

The costs of systematic land registration using the processes developed by LTA, are relatively low at under \$10 per CCRO. The average cost per CCRO is calculated by dividing the total cost of mapping all parcels by the number of CCROs registered and delivered to village registries. The costs exclude the cost of satellite imagery and LTA technical assistance. These costs are set out below and referred to as Component A. The costs included in the \$10 per CCRO are all direct costs associated with CCRO production costs, fieldwork (transportation and fuel, payment of parasurveyors and adjudicators, LTA and DLO staff field payments, and equipment, which is depreciated over a reasonable period of project activity) (LTA, 2016), and referred to below as Component B. The costs of VLUPs and Village Registry

Office Rehabilitation have been added to Component B. The sustained low costs make it feasible to consider up scaling of the program at a national level.

It is proposed that the model is scaled up as a decentralized model with implementation being done by the DLO completing systematic land registration using MAST in the whole district and establishing TRUST for the execution of post-registration transactions. There are also costs associated with training DLO staff and Village Executive Officers and with introducing the program to villages at the commencement of the program. These are set out below and referred to as Component C. Monitoring, evaluation, and learning is an additional cost and this is covered below as Component D.

### **District Land Office equipment costs (Component A)**

The estimated costs set out below are calculated for a hypothetical district with an estimated 100 villages and an average of 1,500 parcels per village. The costs distinguish between those associated with an established DLO and the additional costs associated with implementing a systematic land registration program for the district. DLOs already exist in each district and are staffed and equipped. The regular salaries of DLO and other district department staff are not included as they are paid by the district administration. The per diem payments made for DLO or district department staff members to go into the field are included. These costs are extrapolated from the LTA model which fields seven teams per village. Field teams consist of a hamlet leader, one parasurveyor, and two adjudicators, who demarcate approximately 10 parcels a day. Seven of these small teams work simultaneously in each village supervised by a Field Supervisor and accompanied by a DLO representative, demarcating approximately 70 parcels a day, four days per week, 280 parcels per week, and approximately 1,200 parcels per month. LTA operates four field teams in four villages simultaneously. In the national scale-up model, a DLO staff member replaces the LTA Field Supervisor, thus requiring two DLO staff members per village. If two villages were completed at the same time as per the LTA model, four DLO field staff would be required. Table 2 shows the estimated costs associated with providing the office furniture and equipment required by a DLO to embark on a systematic land registration program for the district.

**Table 2: District Land Office equipment costs to implement a systematic land registration program**

<b>Equipment</b>	<b>Unit</b>	<b>Unit Cost (USD)</b>	<b>Total (USD)</b>
Office furniture			
Tables	7	70.00	490.00
Chairs	14	50.00	700.00
Office cabinet	7	400.00	2,800.00
<b>Subtotal 1</b>		<b>520.00</b>	<b>3,990.00</b>
Registration room			
Registration table	2	300.00	600.00
Registration chairs	12	30.00	360.00
File racks	40	350.00	14,000.00
Village seals	100	150.00	15,000.00

<b>Subtotal 2</b>		<b>830.00</b>	<b>29,960.00</b>
<b>ICT equipment</b>			
Desktop computer	3	1,200.00	3,600.00
Black and white printer	2	2,000.00	4,000.00
Tablets	32	350.00	11,200.00
Garmin Glo	32	90.00	2,880.00
Power Bank	32	30.00	960.00
Local area networking	1	100.00	100.00
USB	32	20.00	640.00
Emlid Reach RS device	2	800.00	1,600.00
<b>Subtotal 3</b>		<b>3,770.00</b>	<b>23,060.00</b>
<b>Total</b>		<b>5,120.00</b>	<b>57,330.00</b>

Source: Feed the Future Tanzania Land Tenure Assistance (LTA), 2019

### Expenses associated with implementation per village (Component B)

Based on LTA's pilot cost of \$10 per CCRO, it is estimated that one village with an average of 1,500 parcels will cost \$15,000 and a district with 100 villages will cost \$1,500,000. Land use planning costs are based on VLUPs costing \$2,000 and DVSPs costing \$3,500. Ninety percent of villages need VLUPs and in addition approximately 15 percent will also require DVSPs. VLUP costs can be included in the costs recovered from the end user, however, it is unrealistic to expect villagers to cover the costs of DVSPs and these will need to be funded from other sources. The costs of reviewing and rectifying village boundaries will be done at the start of implementation in each village and the cost included in Component B and recovered from the end user. Table 3 shows the costs of implementation including rectifying village boundaries, preparing VLUPs, adjudicating and demarcating land parcels and producing CCROs, and rehabilitating and furnishing Village Registry Offices. When broken down to a per CCRO cost, contributions of \$12.66 (TZS30,000) will be required from each CCRO holder per CCRO to cover these costs. The costs per village are estimated at \$19,000 for a village with 1,500 land parcels. The cost per district is \$1,900,500 for a district with 100 villages and \$252,766,500 for all 133 districts.

**Table 3: Expenses associated with implementation**

Component B	Per CCRO US\$	Per CCRO TZS	Per village US\$	Per village TZS	Per district US\$	Per district TZS
CCROs	10.00	23,000	15,000	34,500,000	1,500,000	3,450,000,000
VLUPs	1.34	3,082	2,010	4,623,000	201,000	462,300,000
VLC rectification	0.33	759	495	1,138,500	49,500	113,850,000
Village Registry	1.00	2,300	1,500	3,450,000	150,000	345,000,000
<b>Total</b>	<b>12.66</b>	<b>29,118</b>	<b>19,005</b>	<b>43,711,500</b>	<b>1,900,500</b>	<b>4,371,150,000</b>

Source: Feed the Future Tanzania Land Tenure Assistance (LTA), 2019



### **Cost of training DLOs and introducing the program to villages (Component C)**

Training will be required for each DLO prior to commencement of systematic land registration in that district. Tanzania is divided into eight zones for land administration purposes each headed by a Zonal Assistant Commissioner for Land. Training hubs would need to be established at a zonal level to provide training and technical support for the DLOs in each zone. As Dar es Salaam is one of the zones and is predominantly urban, seven training hubs would be required. The costs associated with these training hubs are estimated at approximately 1 percent of the implementation costs, \$15,000 per district and \$1,995,000 for all 133 districts. Included in these costs are costs related to supervision of and per diem payments for DLO staff to introduce the program to each village as well as a public awareness program conducted in all districts through print, radio, and social media. These costs will need to be covered by funds sourced by the national government and are not included in the costs to be recovered from the end user.

### **Costs of third party monitoring, evaluating, learning and oversight (Component D)**

A project management unit whose role it will be to prepare implementation plans and to monitor and evaluate progress will be required. The unit will have to have the support of the Ministry of Lands and operate across the whole country. The Rural Directorate of the Ministry of Lands have implemented a systematic land registration in five villages using MAST and may be well placed to provide oversight and evaluation of the national scale-up. Another organization that may be suitable to assist in the process is the Property and Business Formalization Program (Mkurabita), which was established in 2004 to address the issue of land access and titling. Funding and logistics for this aspect of the national scale-up will require further exploration and is beyond the scope of this paper, however, the funds will need to be provided from a source other than the end user. The estimated cost for this component is based on a factor of approximately 10 percent of the implementation costs at around \$25,000,000.

### **Total costs of a national scale-up**

There are 133 rural districts in Tanzania. There are close to 3,000 wards in Tanzania, or approximately 22 wards in each district. A ward usually comprises of four to five villages. For the purposes of this exercise it is assumed that every district has 100 villages. In reality there are approximately 12,545 villages (94 villages per district). The costs are based on an estimation of an average of 1,500 parcels per village, however, this fluctuates depending on the size of agricultural parcels and residential density. Table 4 sets out the total costs estimated for a nationwide systematic land registration system based on the estimated

district cost and extrapolated to 133 districts. The cost of equipping a DLO (\$57,330), plus the cost of implementation (\$1,900,500), plus the cost of training DLO staff (\$15,000), plus the cost of monitoring, evaluating, learning, and oversight (\$189,000) amount in total to \$2,161,830 per district. The total cost for all village land in Tanzania is estimated to be \$287,523,390. If a user pays system is adopted and the implementation costs (Component B) are recovered from the CCRO holders, then the funding required from external sources is \$35 million. In addition funding is required for satellite imagery estimated at \$7 million, rehabilitation of District Land Offices estimated at \$3,5 million, and Detailed Village Settlement Plans (DVSPs) estimated at \$10 million.

**Table 4: Total costs of a national scale up**

	Description	Cost per district	Total cost 133 districts
<b>Component A</b>	District Land Office equipment costs	\$57,330	\$7,624,890
<b>Component B</b>	Expenses associated with implementation based on 100 villages per district	\$1,900,500	\$252,766,500
<b>Component C</b>	Cost of training District Land Offices and introducing the program - public awareness	\$15,000	\$1,995,000
<b>Component D</b>	Costs of third party monitoring, evaluating and learning	\$189,000	\$25,137,000
<b>Subtotal</b>		<b>\$2,161,830</b>	<b>\$287,523,390</b>
<b>Contingencies:</b>			
	Satellite Imagery		\$7,000,000
	Rehabilitation of District Land Offices		\$3,500,000
	Detailed Village Settlement Plans (DVSPs)		\$10,000,000
<b>Total</b>			<b>\$308,023,390</b>

Source: Feed the Future Tanzania Land Tenure Assistance (LTA), 2019

### Funding sources and involvement of financial institutions

It is proposed that funding for this program is multi-sourced. The initial set-up costs (Component A: \$7,624,890), the costs of training DLOs, VEOs, and introducing the program to villages in the district (Component C: \$1,995,000), and the costs of monitoring, evaluation, learning and oversight (Component D: \$25,137,000) are covered through funding sourced by government together with contingency costs of \$20,500,000). It is further proposed that the costs of fieldwork and production of CCROs, preparation of VLUPs, village boundary rectification, and rehabilitation and furnishing of Village Registry Offices (Component B: \$252,766,500) are recovered from village residents. The amount required from each CCRO holder per CCRO under this proposal is \$12.66 (TZS 30,000). The proposed model will allow people to pay in installments. The current cost for spot registration of a CCRO as an individual is TZS 250,000 (\$108), so the costs anticipated under the new model are significantly lower.

There is a well-established system in villages to collect contributions from residents for the cost of public facilities such as village offices, schools, and water supply. The Village Council collects the contributions

and administers them through a commercial banking institution. This model has been used in urban areas where residents contribute collectively to cover the costs of survey and issuance of Certificates of Occupation (COs), using the commercial banks to assist in the administration and disbursement of funds.

Financial institutions are willing to lend against CCROs. They tend to lend to individual landholders with holdings in excess of 50 acres, but also have packages to lend to groups of individuals whose holdings are smaller. In response to a question in parliament in May 2018, the Deputy Minister of Lands emphasized the importance of CCROs and stated that in the financial year July 1, 2016, to June 30, 2017, the following financial institutions: NMB, CRDB, Stanbic Bank, SIDO, PSPF, Agriculture Trust Fund Bank, MERU Community Bank, and the Agricultural Inputs Fund issued a total of TZS 59.2 billion (\$26 million) as loans with CCROs used as collateral (Mabula, 2018). The high cost of mortgage registration has limited the registration of mortgages. The Ministry of Lands Task Force has reduced the fee for registering mortgages from \$100 to \$10. Banks use the deeds registry to confirm ownership, to ensure that they are lending to the correct landholder. MAST has improved the banks' ability to identify the land by providing accurate digital diagrams rather than hand drawn sketches as was the case on old CCROs. As village land, in practice, is sold to residents of the same village or someone approved by them, the banks experience difficulty disposing of the asset if the lender defaults. The Ministry of Lands Task Force has been requested to examine what legal impediments exist to opening disposition of village land to any willing purchasers to make loans to villagers more attractive to the banks.

It is proposed that LTA will test the user-pays model in two or more villages in Mbeya Rural District by inviting the villages to participate in the process. LTA will design a program that operates on the basis that processes will commence at certain points as the bank confirms that it has received a certain percentage of the overall contributions. The bank will make disbursements for residents and government officials employed in the implementation of the program such as parasurveyors and adjudicators and District Land Officials on receipt of certain predetermined confirmation of work done, and the CCROs will only be produced and issued to residents when the total contributions have been paid. Piloting this model will identify challenges that need to be addressed before a national scale-up.

## **Conclusion**

The LTA model for systematic land registration using MAST and administering land thereafter using TRUST is replicable and has gained a great deal of interest from national government, DLOs, and village residents. The model is decentralized in that the DLO with the participation of village leaders and village residents implements it at village level, however, it can be integrated into the national land management and information system (ILMIS). If the data can be stored at national level for backup purposes and relatively cheap satellite imagery can be sourced, the challenges encountered during the LTA pilot can be

overcome by decentralizing village boundary rectification and preparation of VLUPs and DVSPs and preparing them at a much-reduced cost. The direct costs of implementation including rectification of village boundaries, preparation of VLUPs, adjudicating and demarcating land parcels, producing and issuing CCROs, and upgrading village registry offices of approximately \$12.66 (TZS 30,000) per CCRO can be contributed by the CCRO holder. The contributions can be managed by the village council and administered through a commercial bank, which will collect funds and disburse payments as required. The funds for equipping DLOs of approximately \$57,000 per district, together with the costs of training DLO staff, Village Executive Officers, and educating the public about the program (\$15,000 per district), as well the costs of monitoring, evaluating, learning, and oversight (\$189,000) per district will need to be alternatively sourced as will the costs of detailed village settlement planning, rehabilitation of District Land Registries, and supply of satellite imagery (\$20,500,000) as these costs are beyond the affordability of village residents. The total costs of a national scale up are in the order of \$308 million and \$252 million of the overall cost could potentially be recovered from the end user or CCRO holder. Tanzania is ready for national implementation of a village land registration program.

## References:

- Baldwin, R., English, C., Lemmen, C. H. J., Rose, I., Smith, A., Solovov, A., & Sullivan, T. (2018). Are local registers the solution? *19th Annual World Bank Conference on Land and Poverty 2018*(19).
- Bennett, R., Rajabifard, A., Williamson, I., & Wallace, J. (2012). Nations need national land administration infrastructures. *FIG Peer Review Journal*(2412-916x).
- Burns, T., & Fairlie, K. (2018). *Framework for Costing and Financing Land Administration Services (CoFLAS)*. Retrieved from Nairobi, Kenya: <https://gltn.net/download/framework-for-costing-and-financing-land-administration-services-coflas/?wpdmdl=13304&refresh=5c62787c9febd1549957244>
- Byamugisha, F. (2013). *Securing Africa's Land for Shared Prosperity: A Program to Scale Up Reforms and Investments*. Washington: D.C.: World Bank.
- de Soto, H. (2001). Dead Capital and the Poor. *SAIS Review*, 21(1), 13-43.
- Dekker, H. A. L. (2017). *The Invisible Line: Land Reform, Land Tenure Security and Land Registration*: Taylor and Francis.
- del Castillo, M. (2018). Moving To Marrakesh: Why The Blockchain Summit At Richard Branson's Private Island Moved To Africa. *Forbes*. Retrieved from Forbes website: <https://www.forbes.com/sites/michaeldelcastillo/2018/07/09/moving-to-marrakesh-why-richard-branson-took-the-blockchain-summit-to-africa/-5cd024fd7cec>
- GISGeography. (2019). GISGeography. Retrieved from <https://gisgeography.com/>

Gramm, P., & de Soto, H. (2018, 26 Jan 2018). How Blockchain can end poverty. *Wall Street Journal*,. Retrieved from <https://search-proquest-com.ezproxy.library.uq.edu.au/docview/1991075405/?pq-origsite=primo>

Keenan, J. (2018). Blockchain is changing lives in Africa. *Reason*. Retrieved from Reason website: <https://reason.com/archives/2018/10/27/blockchain-is-changing-lives-i>

Kshetri, N. (2017). Will blockchain emerge as a tool to break the poverty chain in the Global South? *Third World Quarterly*, 38(8). doi:10.1080/01436597.2017.1298438

LTA. (2016). USAID/LTA Monitoring and Evaluation Plan In.

Mabula, A. (2018). Primary Questions Parliament of Tanzania. Retrieved from [http://parliament.go.tz/primary\\_questions/61/3356/read](http://parliament.go.tz/primary_questions/61/3356/read)

Tai, B. (2018). Blockchain and the Key to Smart Capitalism. *medium.com*. <https://medium.com/@billtai/blockchain-and-the-key-to-smart-capitalism-c91348468830>

Unknown. (2018). Ghana Looks to Partner with IBM for Blockchain-Based Land Administration. *ICT Monitor Worldwide*.

USAID. (2015). USAID Land Tenure Assistance Activity Award No: AID-OAA-I-12-00031/Task Order No: AID-621-TO-16-00005. In.

Vos, J. (2017). Blockchain and land administration: a happy marriage? *European Property Law Journal*, 6(3), 293-295. doi:10.1515/eplj-2017-0018

Vos, J., Lemmen, C. H. J., & Beentjes, B. (2017). Blockchain-based land administration: Feasible, illusory or panacae? *Responsible Land Governance: Towards and Evidence Based Approach, Washington, D.C. March 20-24, 2017 : Proceedings of the Annual World Bank Conference on Land and Poverty*.

Zwitter, A., & Boisse-Despiaux, M. (2018). Blockchain for humanitarian action and development aid. *Journal of International Humanitarian Action*.

Table 1: Readiness for a national scale-up.....	13
Table 2: District Land Office equipment costs to implement a systematic land registration program.....	21
Table 3: Expenses associated with implementation.....	22
Table 4: Total costs of a national scale up .....	24
Figure 1: Systematic village land registration process.....	11

*The views expressed in this paper are entirely those of the authors and do not represent those of DAI, USAID or Government of Tanzania.*