COST AND TIME EFFECTIVENESS STUDY – FINAL REPORT

MOBILE APPLICATION TO SECURE TENURE

PILOT IN TANZANIA

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ACRONYMS

CCRO	Certificate of Customary Right of Occupancy
CEA	Cost-Effectiveness Analysis
CPI	Consumer Price Index
CTE	Cost and Time Effectiveness
DLO	District Land Office
E3	Bureau for Economic Growth, Education, and Environment (USAID)
ERC	Evaluation, Research, and Communication
GD	Group Discussion
GIS	Geographic Information Systems
GoT	Government of Tanzania
GPS	Global Positioning System
HH	Household
KII	Key Informant Interview
LU	Office of Land and Urban (USAID/E3)
MAST	Mobile Application to Secure Tenure
MKURABITA	*Mpango wa Kurasimisha Rasilimali na Biashara za Wanyonge Tanzania* (Property and Business Formalisation Progamme)
MLHHSD	Ministry of Land, Housing, and Human Settlement Development
MSI	Management Systems International
NGO	Non-Governmental Organization
PSCP	Private Sector Competitiveness Project
SOW	Statement of Work
STARR	Strengthening Tenure and Resource Rights
USAID	United States Agency for International Development
VEO	Village Executive Officer
VILUM	Village Land Use Management Committee
VLUP	Village Land Use Plan
WB	World Bank

EXECUTIVE SUMMARY

Introduction and Study Purpose

This Cost and Time Effectiveness (CTE) study is the second part of a two-part performance evaluation of the Mobile Application to Secure Tenure (MAST) pilot in Tanzania. The Office of Land and Urban in the United States Agency for International Development's Bureau for Economic Growth, Education, and Environment (USAID/E3/LU) commissioned the CTE study, and the E3 Analytics and Evaluation Project designed and implemented it. The CTE study examined the MAST approach relative to previous and ongoing alternatives in Tanzania for gathering property boundary data and securing land tenure through the delivery of Certificates of Customary Right of Occupancy (CCROs). The CTE study consists of two components. A quantitative component estimated and compared the cost-per-parcel of CCRO delivery across two MAST pilot villages and four comparison approaches in Tanzania. A qualitative component assessed quality dimensions of customary land mapping and CCRO delivery via the MAST process relative to comparison processes, drawing on interviews and group discussions with district land office staff, village officials, and beneficiaries.

Given interest among governments and donors in finding low-cost, high-quality solutions for mapping and documenting land use rights at scale, the CTE study aims to provide practical information on cost, time, and quality dimensions of the MAST technology and approach that may be useful for further refining and scaling the approach. The study also aims to contextualize this information relative to comparable efforts to map property and secure land tenure under Tanzania's procedures for issuing CCROs.

MAST Pilot Description

The MAST pilot developed and implemented a new crowd-sourcing methodology using mobile phone technology to facilitate the process of land mapping and documentation, as well as a new approach that employed village youth as "trusted intermediaries" responsible for mapping land in their village. USAID selected Tanzania as the country in which it carried out pilot tests to ground-truth the technology, information transfer, and community education/advocacy components of the pilot's approach. The MAST pilot supported the Government of Tanzania (GoT) in trying to improve land governance and lower the cost of land certification programs, with the aim of providing an alternative to more traditional, and potentially costlier, land administration interventions.

The Cloudburst Group implemented MAST in three villages in Iringa Rural District between 2014 and 2016, where the pilot mapped and prepared CCROs for nearly 4,000 parcels across the three villages. The pilot's original goal was to provide a "proof of concept" that mobile technologies could be provided to community members, along with training on land laws and rights, to efficiently and effectively capture land rights information. The pilot transformed into a collaborative experiment with the GoT to work with rural villagers and the District Land Office (DLO) for Iringa Rural District to formally document rights to land, by providing CCROs in accordance with Tanzania's Land and Village Land Acts.

Research Questions

The CTE study examined the following overall question and related sub-questions:

1. Is the MAST methodology as implemented in the second and third pilot sites a cost-effective, time-efficient, and appropriate approach to registering land in Tanzania relative to previous or alternative ongoing approaches?
   a. *Cost-per-parcel:* How does the cost-per-parcel of carrying out mapping, verification, and transmission of the information needed to issue CCROs using the MAST methodology compare to alternative approaches?
   b. *Quality dimensions:* Are there differences between the MAST methodology and alternative approaches in terms of:
      i. Transparency and inclusiveness of the mapping and verification process?
      ii. Quality of the data collection and transmission platform in terms of accuracy, functionality, ease of use, and accessibility?
      iii. Requirements for implementation in terms of time and personnel?

Study Approach

The CTE study team identified four customary land rights mapping and CCRO delivery projects that were broadly similar to the MAST pilot, to form the basis for assessing MAST's cost and time effectiveness. The Tanzanian Ministry of Land, Housing, and Human Settlement Development (MLHHSD), the Property and Business Formalisation Progamme (MKURABITA), Haki Ardhi, and the World Bank's Private Sector Competitiveness Program implemented these 4 projects across 14 districts in Tanzania. The study team requested project details and budget information from implementing institutions, and reviewed this information to identify the similarity of CCRO delivery efforts to the MAST approach and the availability of sufficiently detailed budget information.

The study team assessed Question 1a via a quantitative Cost-Effectiveness Analysis (CEA) of project costs across MAST and comparable land mapping and CCRO delivery efforts in Tanzania. The study team's methods for the CEA were somewhat exploratory in nature and based on work done in the health and education sectors, since there is currently no standard CEA methodology in the land sector. The CEA estimated the cost-per-parcel of completing the sensitization, mapping, verification, and CCRO preparation process from project budget data, with the study team making adjustments for differences between MAST and the comparison project processes in terms of content, scope, or other aspects that affect costs. To measure effectiveness, the study team used the total number of CCROs prepared. To assess the time dimension, the study team considered several aspects including the average time required to map individual parcels, the overall time required to accomplish key steps in the process, and the time to process and prepare CCROs.

The study team collected and analyzed qualitative data from village beneficiaries and non-beneficiaries, and village and district officials, to answer Question 1b. The team collected qualitative data in six villages across four districts: the second and third MAST pilot villages, and four villages from four comparison projects used for the CEA.

Limitations and Constraints

The study team obtained sufficiently detailed cost information to conduct a credible cost-per-parcel comparison. However, it had to make some assumptions to proceed with the CEA due to differences in how comparison projects aggregated and reported costs, and it was not always possible to disaggregate costs to the extent desired. Given the lack of precedent for detailed analyses of per-parcel costs and

associated quality of customary land formalization efforts, the study team aimed to describe the cost comparisons as systematically as possible, note the challenges encountered, state assumptions and key sources of uncertainty, and focus on estimated cost ranges rather than point estimates.

Response and recall bias is a potential limitation for the qualitative component of the study, given that the interviews relied on self-reported data. The study team's effort to mitigate these potential biases included triangulation of data from multiple sources. Also, the findings from this study are based on a small number of comparison cases and thus their generalizability is somewhat limited. To address this, the study team aimed to select comparison cases that were typical for the comparison project approach and had context similarity with the MAST process.

Key Findings

Quantitative Cost-Per-Parcel of CCRO Preparation

The study reported two types of cost estimates: (a) the unadjusted cost-per-parcel for CCRO preparation, which draws on all available project budget data; and an adjusted cost estimate based on conservative assumptions to include missing information or exclude costs of non-comparable activities.

Overall, the quantitative cost-per-parcel analyses suggest fairly wide variation in the estimated cost per CCRO prepared across the different projects and districts. Some of this variation likely relates to missing cost information from some projects, or economies of scale realized from implementation in multiple districts, even when the number of villages per district was small. Across the 15 different comparison cases, the unadjusted estimated cost per parcel ranged from $14.80 to $47.70 per CCRO prepared (reported in 2010 dollars). The unadjusted unit cost per CCRO prepared was $47.70 across the two MAST pilot villages, while the adjusted estimated cost for MAST was $32.70. After considering differences in the MAST structure, excluding village land use planning and registry renovation costs, and varying assumptions on personnel and other elements of the comparison projects via a sensitivity analysis, the adjusted cost-per-parcel range was $9.00 to $35.70 per CCRO prepared. Within that range, the estimates for half of the cases were under $20 per CCRO prepared, and the remaining half ranged from $20 to $36 per CCRO prepared.

While the estimated cost of MAST is on the higher end of the comparison, the pilot's approach appears to have provided CCROs to village land users substantially more quickly. For MAST, the per unit *time to initial CCRO delivery in the village* was estimated at 0.1 to 0.2 days per CCRO prepared, while it ranged from 0.5 to less than 8.4 days per CCRO prepared across the comparison projects. The MAST approach also scored higher on key quality criteria, with potential efficiency benefits and villagers more knowledgeable and trusting in the land formalization process.

Project and village context factors likely affected these results. The nature and implementation structure of the MAST pilot involved some costs that may be redundant under a more DLO-embedded implementation. MAST also worked through multiple partners in Tanzania, which involved additional layers of project management and oversight. The comparison projects worked more directly through district and MLHHSD staff. In addition, efforts that are smaller in scope, with fewer villages covered per district, are likely to be costlier on a per CCRO basis. Factors related to project context may contribute to variability in the unit cost of CCRO preparation across the comparison cases and can significantly affect cost when the overall project scope is small, including. Two such factors the study team identified during qualitative data collection are village topography and the presence of protracted disputes.

The study team also examined patterns in resource allocation across the comparison cases, which could relate to overall quality and sustainability of CCRO service delivery. While some of the observed differences likely stem from the different ways that projects aggregated costs, the proportion of

resources devoted to trainings and workshops appears to have been higher for MAST (and one of the comparison approaches). The study team linked this to the overall quality of the approach, suggesting that the depth and content of sensitization efforts, and time window provided for parcel mapping in a village, had positive implications for the levels of knowledge and trust that villagers have in the process and the ability for potential beneficiaries to have their land mapped. Also, all comparison cases allocated a fairly large share of resources to personnel, which may simply be a reality of customary land formalization efforts, or offer scope for additional efficiencies by future efforts.

Quality Dimensions

The study team found that the following factors contributed to higher quality of the land formalization process under the MAST approach as compared to the more traditional mapping and CCRO delivery approaches of comparison projects:

- Conducting extensive village sensitization efforts that devoted time and resources to multiple events within a given village, and aimed for broad knowledge on land laws, rights, gender issues, and the land mapping and CCRO delivery process. While several of the comparison projects also devoted substantial resources to sensitization efforts, the additional hamlet-by-hamlet effort and training content adopted by MAST appears to have been effective at garnering greater inclusion, feelings of inclusiveness, empowerment, and trust in the accuracy of the information, and depth of knowledge. These are important achievements for the longer-term sustainability of these activities.
- Using the more accessible smart-phone app plus Geographic Information Systems (GIS) to conduct integrated land mapping and digital collection of land user information according to GoT needs, rather than less streamlined approaches used by the comparison projects. The MAST app enabled more efficient collection of information, direct verification by land users, and substantially reduced opportunities for data entry errors that were reported to be common for the uncoupled process. The MAST technology also had a lower learning curve and enabled a more participatory team structure for land mapping, use of less costly staff, and greater flexibility for the timing and duration of land mapping in a village. In turn, this appears to have enabled a greater number of potential beneficiaries to have their land mapped, and may provide flexibility and additional mediation resources for more protracted disputes to be resolved within the time available for mapping.
- Using village youth as trained intermediaries to conduct technical land-mapping and rights documentation work. Because these intermediaries are already located in villages, and do not require per diem expenses at the level of district staff, this approach allows for conducting parcel mapping over a longer time period, if needed. This flexibility of the MAST approach may be important from a quality and completion standpoint, where village-wide mapping is the aim. Study respondents across all of the comparison approaches expressed dissatisfaction at the short window allocated for land mapping, noting it was a key reason why many households could not have their land mapped. In the Tanzanian context, a process that can maintain quality and accuracy of parcel and land user information via a set of village staff, with reduced time required for district staff to be in the field, will likely be more cost-effective and improve the overall quality of the mapping effort.
- Having integrated, electronic transmission of the parcel data and land user information by the MAST app in a database that is automatically backed up, accessible to the DLO, and conforms to GoT standards for CCROs. The efficiencies for data entry and the potential for reducing errors in land user information appear to be salient benefits of the MAST approach for DLO staff, as compared to the approach commonly used for land formalization in Tanzania that tends to require lengthier and more error-prone manual data entry. While MAST was expected to provide more transparent and internet-accessible land user information, this expected benefit does not currently appear to be strongly important to villagers in the Tanzanian context.

In terms of time and personnel implementation requirements, there was little difference in the time to map individual parcels between the different technologies adopted across the comparison cases, which respondents agreed was most strongly driven by plot context factors rather than the mapping technology. However, the MAST process appears to have provided CCROs to village land users substantially more quickly. DLO respondents also agreed that MAST's integrated technology and streamlined process was more efficient and less prone to errors than their traditional system.

Conclusions

Cost and Quality Trade-offs

There is some evidence of a trade-off between per unit cost and quality. While the estimated cost of the MAST approach appears to be on the higher end of the comparisons, the MAST approach also appears to have provided CCROs to village land users substantially more quickly. There also appear to be some clear advantages of the MAST system over the typical approaches to land formalization documentation adopted by the comparison projects, with benefits to overall quality of the results, time to complete the CCRO process, and beneficiary overall trust in the process. The MAST approach scored higher on key quality criteria, with potential efficiency benefits, and villagers more knowledgeable and trusting in the land formalization process.

While all of the comparison approaches experienced challenges completing the culminating step from CCRO preparation to actual delivery of the document to target beneficiaries, the MAST process appears to have navigated this process fairly successfully. This is important, as delivery of the CCRO documents to individual villagers is a key objective of any land formalization process, and a crucial element of the overall theory of change for improved household tenure security and economic wellbeing through customary land formalization programs.

Key Considerations and Learning

While cost is a crucial consideration to inform scaling up, the qualitative component of this study provided an opportunity to examine differences in equally important non-cost dimensions, such as transparency and inclusiveness of the mapping and verification process, quality and accessibility of the land information compiled, and overall time and personnel resources required. Although the cost-per-parcel analysis suggested that some of the comparison approaches may be more parsimonious to achieve CCRO delivery than the MAST approach, it is not clear that the quality of service provided under such less costly approaches is as well situated to effectively meet the broader objectives of customary land formation efforts, such as reduced land conflicts, improved tenure security, increased land investment, and overall household economic wellbeing. Still, villagers across all of the comparison cases expressed a lack of certainty as to how the CCRO would ultimately help them to obtain some of the benefits purported by projects, including access to loans.

Contributions to Approaches to Cost Accounting of Per-Parcel Land Formalization Efforts and Overall Effectiveness

The exploratory nature of this study highlighted some key challenges and contributors to uncertainty in trying to systematically compare per-parcel costs of land formalization efforts across different cases. This initial effort may serve as a useful entry point for other research to examine the per-parcel costs of customary land formalization projects, consider how such costs may relate to the overall quality and sustainability of the effort, and facilitate informed decisions on intervention options. To improve on the accuracy of cost estimates, future efforts may benefit from tracking costs during project implementation

with this explicit goal in mind. Accuracy may also be improved by tracking effort and staff days across each of the steps in service delivery more explicitly, which may also contribute to understanding where greater efficiencies to time and personnel costs might be gained. This would also include, for example, considerations of volunteer or unpaid personnel or labor contributions to activities, including that of villagers who may not always be paid allowances for their inputs, and accounting for materials and equipment used by the project that were not directly paid for with project funds.

To enable assessment of the cost effectiveness of different potential land formalization approaches against the longer-term outcomes that such interventions aim to promote, future work could also consider drawing on effectiveness measures obtained from rigorous surveys of beneficiaries examining longer-term outcomes that are anticipated to result from CCRO provisioning, such as measures of tenure security, conflict incidence, land rental, or investment within villages. However, this would require more extensive data collection than was possible for this study, as well as sufficient time for such potential outcomes to accrue. Understanding costs per unit CCRO and the links to quality and the likelihood of achieving longer-term project goals is an important contribution. In addition, such longer-term analyses can also ultimately enable evidence-based decisions on development programming sthat decision-makers are able to select interventions that are both cost effective and likely to reach quality goals.

INTRODUCTION

This Cost and Time Effectiveness (CTE) study is the second part of a two-part performance evaluation of the Mobile Application to Secure Tenure (MAST) pilot in Tanzania. The Office of Land and Urban in the United States Agency for International Development's Bureau for Economic Growth, Education, and Environment (USAID/E3/LU) commissioned the CTE study, and the E3 Analytics and Evaluation Project designed and implemented it.[1] The first evaluation task was to conduct a performance evaluation focused on the first of three MAST pilot sites in Tanzania, which the E3 Analytics and Evaluation Project completed in June 2016.[2]

The CTE study examined the MAST approach relative to previous and ongoing alternatives in Tanzania for gathering property boundary data and securing land tenure through the delivery of Certificates of Customary Right of Occupancy (CCROs). The CTE study consists of two components. A quantitative component estimated and compared the cost-per-parcel of CCRO delivery across two MAST pilot villages and four comparison approaches in Tanzania. A qualitative component assessed quality dimensions of customary land mapping and CCRO delivery via the MAST process relative to comparison processes, drawing on information collected from district and village officials and village beneficiaries in the second and third MAST pilot sites and a set of comparison project villages across selected districts.

MAST Pilot Description

USAID/E3/LU funded and oversaw the MAST pilot through its Evaluation, Research, and Communication (ERC) Task Order under the Strengthening Tenure and Resource Rights (STARR) Indefinite Quantity Contract. The Cloudburst Group is the implementing partner for the MAST pilot in Tanzania. MAST developed and implemented a new "crowd-sourcing" methodology using mobile phone technology to facilitate the process of land mapping and documentation, as well as a new approach that employed village youth as "trusted intermediaries" responsible for mapping land in their village. USAID chose to carry out the pilot tests in Tanzania to ground-truth the technology, information transfer, and community education/advocacy components of the MAST approach. The MAST pilot supported the Government of Tanzania (GoT) in trying to improve land governance and lower the cost of land certification programs, with the aim of providing an alternative to more traditional, and potentially costlier, land administration interventions.

The Cloudburst Group implemented MAST in three villages in Iringa District, Tanzania between 2014 and 2016, where the pilot mapped and prepared CCROs for nearly 4,000 parcels across the three villages. The pilot's original goal was to be a "proof of concept" that mobile technologies could be provided to community members, along with training on land laws and rights, to efficiently and effectively capture land rights information. The pilot quickly transformed into a collaborative experiment with the GoT to work with rural villagers and the District Land Office (DLO) for Iringa Rural District to formally document land rights, by providing CCROs in accordance with Tanzania's Land and Village Land Acts.

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[1] Team lead Management Systems International (MSI) implements the E3 Analytics and Evaluation Project in partnership with Development and Training Services (dTS) and NORC at the University of Chicago.
[2] See: http://pdf.usaid.gov/pdf_docs/pa00m7zk.pdf

Study Purpose, Audiences, and Intended Uses

Given interest among governments and donors in finding low-cost, high-quality solutions for mapping and documenting land use rights at scale, the CTE study aims to provide practical information on cost, time, and quality dimensions of the MAST technology and approach that may be useful for further refining and scaling the approach. It also aims to contextualize this approach relative to comparable efforts to map property and secure land tenure under Tanzania's procedures for issuing CCROs. The incorporation of a quality dimension for the study reflects donor interests in finding low-cost solutions that are also socially responsible and sustainable. In addition to USAID/E3/LU, audiences for this study include USAID/Tanzania and other Agency operating units interested in strengthening land tenure security, as well as Tanzania's Ministry of Land, Housing, and Human Settlement Development (MLHHSD). The information obtained through this study complements previous evaluation work and related efforts to document and assess the MAST pilot.

Research Questions

As described in USAID's approved SOW for the CTE study and the related MAST performance evaluation (see Annex A), this study examines the following overall question and related sub-questions:

1. Is the MAST methodology as implemented in the second and third pilot sites a cost-effective, time-efficient, and appropriate approach to registering land in Tanzania relative to previous or alternative ongoing approaches?
    a. *Cost-per-parcel:* How does the cost-per-parcel of carrying out mapping, verification, and transmission of the information needed to issue CCROs using the MAST methodology compare to alternative approaches?
    b. *Quality dimensions:* Are there differences between the MAST methodology and alternative approaches in terms of:
        i. Transparency and inclusiveness of the mapping and verification process?
        ii. Quality of the data collection and transmission platform in terms of accuracy, functionality, ease of use, and accessibility?
        iii. Requirements for implementation in terms of time and personnel?

Study Design

The CTE study used a combination of quantitative and qualitative methods to answer USAID's research questions. The study team assessed Question 1a via a quantitative Cost-Effectiveness Analysis (CEA) of project costs across MAST and comparable land mapping and CCRO delivery efforts in Tanzania. The study team assessed Question 1b via qualitative data collection across village beneficiaries and non-beneficiaries, and village and district officials. The team collected qualitative data in the second and third MAST pilot villages, and in four villages from four of the comparison projects used for the CEA. The next section describes in more detail the quantitative and qualitative approaches.

STUDY METHODOLOGY

Overview of the Methodology

The CTE study identified four previous land formalization projects in Tanzania that are broadly similar to the MAST pilot, to form the basis for the comparative assessment. The study team identified the

comparison projects during a scoping mission in Tanzania, and requested project implementation details and budget information from the implementing institutions. The team subsequently reviewed this information to identify projects that had conducted broadly similar CCRO delivery efforts, and for which sufficiently detailed budget information was available. For the MAST and comparison project approaches, the study team calculated the estimated cost-per-parcel of completing the sensitization, mapping, verification, and CCRO preparation process using CEA. The team carried out the CEA using project budget data, with adjustments made for differences between MAST and the comparison project processes in terms of content, scope, or other aspects that affect costs.

Although many sectors increasingly highlight the need for CEAs of development interventions, there is currently no standard CEA methodology in the land sector, and a lack of comparable existing work in this area. Therefore, the study team based its methods for the CTE study on work done in the health and education sectors, which have a more extensive history of CEA for development interventions and good agreement on the elements of a standard approach to conducting such studies (McEwan 2012; Dhaliwal et al. 2012). In that sense, the CEA approach employed for this study is somewhat exploratory in nature and is based in two main assumptions: (1) the projects being compared via the CEA have very similar goals, and (2) the projects have similar measures of effectiveness that are available to draw on (Levin and McEwan 2001). A CEA is targeted to estimate the dollar (or local currency) amount needed to achieve a certain outcome. Such an analysis enables project decision-makers to select the project alternative that has the lowest cost-per-unit of effectiveness.

In addition to the CEA, this study also considered differences in non-cost dimensions, such as transparency and inclusiveness of the mapping and verification process, quality and accessibility of the land information compiled, and overall time and personnel resources required. These were assessed through group discussions (GDs) and key informant interviews (KIIs) with the respective DLO staff and in selected villages where the MAST and comparison project processes were implemented. The study team used the qualitative data to classify the land mapping and CCRO delivery process used by each project according to a set of non-cost dimensions, so that these elements could be considered in parallel with information on costs. To facilitate integration of the qualitative and quantitative data, and a more systematic comparison across cases, the team also assigned the qualitative classifications it developed for each case a numeric rating that corresponds to specified criteria described in the qualitative approach (see Table 3 and the Qualitative Data Collection Approach section).

The remainder of this section details the following elements of the methodology:

1. The approach to identify and select comparison customary land mapping and CCRO delivery projects for inclusion in the study.
2. The CEA methodology to determine and compare the cost-per-parcel across MAST and selected comparison projects.
3. The qualitative approach to assess quality dimensions of the MAST approach relative to comparable efforts in Tanzania, and its integration with the cost-per-parcel information to provide a comprehensive understanding of the cost and time effectiveness of the MAST approach.

Comparison Project Identification and Selection

The study team began the process of identifying comparison projects in late 2015, resulting in the identification of four similar customary land rights mapping and CCRO delivery projects. These were implemented by MLHHSD, the Property and Business Formalisation Progamme (MKURABITA), Haki Ardhi, and the World Bank Private Sector Competitiveness Program (WB PSCP) across 14 districts, as shown in Table 1. The study team obtained preliminary cost and other information about each of these

projects from the implementing institutions. Each project-district combination is considered as a separate project effort, since the nature and timing of activities was generally conducted separately by district for each of the projects.

<div align="center">

TABLE 1: COMPARISON PROJECT EFFORTS AND NUMBER OF VILLAGES BY DISTRICT

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	Project	District	# of Villages Covered
1	MAST	Iringa*	3
2	MLHHSD	Bagamoyo	2
3	MLHHSD	Babati	4
4	MLHHSD	Mvomero*	97
5	MKURABITA	Ludewa	2
6	MKURABITA	Sumbawanga	2
7	MKURABITA	Kilombero	2
8	MKURABITA	Mbarali	2
9	MKURABITA	Rufiji*	5
10	MKURABITA	Mvomero*	2
11	Haki Ardhi	Kilolo*	10
12	Haki Ardhi	Mufindi	6
13	Haki Ardhi	Mkinga	3
14	WB PSCP	Bariadi	9
15	WB PSCP	Babati	9
	Total Non-MAST Villages		**155**

*Districts and projects included in qualitative data collection.

Determination of Project Similarity

To ensure that the selected comparison projects were broadly similar to MAST (i.e., that they were customary land rights mapping projects with aims of recording parcel boundary and land user information for CCRO preparation and delivery), the study team obtained detailed information from project points of contact on each of the main activities or tasks undertaken, and the different steps in the project work plan starting from sensitization activities in districts or villages, through to CCRO delivery to households. This understanding of the main activities and work flow undertaken across each project was essential to ensure that the different projects are broadly comparable, to identify where project activities may have differed from the MAST process, and to be able to make informed decisions to justify the inclusion or exclusion of specific cost information for each project in the final CEA, where necessary. Drawing on project information from MAST and the identified comparison projects, Table 2 provides an overview of the typical steps that are involved in a participatory land use mapping and CCRO delivery effort in Tanzania, and highlights the steps covered by MAST and each of the candidate comparison projects.

TABLE 2: GENERALIZED ACTIVITY STEPS FOR LAND USE MAPPING AND CCRO DELIVERY IN TANZANIA

Activity Step/CCRO program	MAST	MLHHSD	MKURABITA	Haki Ardhi	WB PSCP
Village sensitization and awareness raising on VLUP; committee formation as needed		X	X	X	X
District and village land registry establishment and capacity building		x	x	x	x
Obtain and process satellite images	x	X			X
Village land survey and boundary demarcation; issuance of Certificate of Village Land		x	x	x	x
Prepare and implement participatory VLUP; prepare and approve village by-laws		X	X	X	X
Village sensitization and awareness raising on CCROs, including:[a]	X	X	X	X	X
Villager training on land laws	X				
Selection and training of trusted intermediaries	X				
Training of Village Executive Officers or Village Land Use Management Committee	X	X	X	X	X
Parcel surveying and adjudication within villages	X	X	X	X	X
Information download, plotting of parcel maps	X	X	X	X	X
Verification of parcel maps and CCRO document information within villages	X	X	X	X	X
Public verification and village wide consent	X	X	X		?
Individual verification	X	X	X	X	?
CCRO preparation and finalization, including document printing	X	X	X	X	X
CCRO registration and issuance to beneficiaries[b]	X	X	X	X	X

X: Project records indicate this was done for a subset of project villages, when not completed prior to project arrival.
?: Not clear from project documentation.
[a]: Based on incomplete information; specific village-level training is highlighted where it differs across the projects listed.
[b]: Although CCRO delivery is an overarching objective for all of the projects, the qualitative fieldwork indicated that projects differed in the extent to which they funded and facilitated all aspects of CCRO registration and issuance.

As Table 2 illustrates, the projects are broadly similar in terms of process. Key differences are that all of the identified comparison projects included village land use planning in their process, while MAST was designed to engage in individual land rights mapping after a Village Land Use Plan (VLUP) and village by-laws had already been prepared and approved. Also, the WB PSCP used satellite imagery to assist with the village and parcel mapping, while the other projects did not. These are notable differences with separable costs that were adjusted for in the cost-per-parcel comparison and results interpretation. The nature of sensitization and awareness activities also differs somewhat across the projects. For example, the village-level training for MAST devoted additional effort to villager training on land laws, and to the selection and training of trusted intermediaries to implement MAST's participatory mapping process. Keeping in mind that such differences may have cost and/or quality implications, the study team considered them in both the CEA and qualitative analysis and interpretation.

Cost-Effectiveness and Time Analyses of Per-Parcel CCRO Delivery Approach

Cost Information

The CEA aimed to quantify the cost-per-unit of project effect (McEwan 2012) to determine the incremental cost to conduct participatory land rights mapping and prepare each additional CCRO document. This enables a standardized comparison across MAST and comparable processes. CEA studies rely on obtaining accurate and comparable cost information across different projects, which is also the primary challenge of such studies. Cost information can be reported in several ways, and different projects do not necessarily use the same cost recording or reporting conventions. Thus, an important step in the CEA is to systematically determine project costs and organize the cost information that is obtained across different projects. To do so, the study team followed the "ingredient" method for undertaking a CEA (Levin and McEwan 2001), in which all of the ingredients (resources) that are required to carry out the project are identified, and a value is assigned to each based on project cost data (or, where not explicitly captured, as estimated from secondary data).

The cost of an intervention is defined as "the value of all the resources that it utilizes; had they been assigned to their most valuable alternative use" (Levin and McEwan, 2001, p.44). This refers to the opportunity costs involved in spending a dollar on the given intervention instead of using it for other activities. In using this definition, the study team aimed to capture costs that may go beyond those reported in budget reports, keeping in mind that it is possible that not all of the incurred costs will be included in standard budget reports (e.g., if the project made use of volunteers for certain activities and did not compensate for their time). To ensure that all relevant costs are captured, the study team drew on multiple information sources to obtain an in-depth understanding of the different resources that may have been involved in project implementation. This included drawing on project work plans or descriptions of project activities and personnel involved that were provided to the study team, and having follow-up communications with project points of contact to clarify uncertainties.

Following Levin and McEwan (2001), the study team included five standard cost categories in the analysis: (1) personnel, (2) facilities, (3) equipment and materials, (4) other project inputs, and (5) required client inputs. Then, to account for the specific land rights mapping and CCRO delivery project context, the study team additionally include administration, travel, training, workshops, and service delivery cost categories. An overview of each category is described below:

1. *Personnel:* Includes all costs pertaining to salaries and fringe benefits for human resources (i.e., staff, consultants, or volunteers) involved in the project's functioning.
2. *Facilities:* Includes all costs related to the acquisition, renovation, or renting of office or storage space for the use by the project.
3. *Administration:* Includes all administrative costs involved in the functioning of the project on a day-to-day basis.
4. *Equipment and Materials*: Includes all costs related to the furnishing of the office space, and purchase of any necessary materials and equipment to allow the project's functioning.
5. *Travel:* Includes all costs related to travel expenses for project implementation, including per diems.[3]

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[3] Given that per diems in Tanzania are paid not only during travel by project personnel, but also as supplemental allowances for participation in project activities by some personnel, the study team considered moving per diem under personnel costs rather than travel. However, the team decided to keep it under travel to maintain comparison consistency, because some of the comparison projects aggregated per diems with other travel costs.

6. *Training:* Includes all costs related to training in activities that pertain to project functioning and/or service delivery.
7. *Workshops:* Includes all costs related to the sensitization and socialization of project activities.
8. *Service Delivery:* Includes costs pertaining to the direct delivery of the service or activity by the project. In the context of land rights mapping and CCRO delivery projects, this may include specific costs for: parcel surveying and adjudication; installation of a CCRO administration system; mapping data downloads and plotting; CCRO printing; and CCRO verification, registration, and issuance.
9. *Required client inputs:* Includes all costs, if available or required, that users of the service contribute to access the service.[4]

Lastly, given that the different projects under comparison were implemented over slightly different time periods, the study team transformed all costs in local currency to constant 2010 U.S. dollars[5] using the Consumer Price Index (CPI) and exchange rates for Tanzania, for each year of project implementation across the different projects assessed.[6]

Effectiveness Measures

The second key element in the CEA is the effectiveness measure. Levin and McEwan (2001) suggest that a measure of effectiveness should be a reflection of the main objective of the project, and also should be comparable across the different intervention alternatives. Given the focus of the MAST pilot, the total number of CCROs prepared was used as the effectiveness measure for this study.[7] This information was consistently reported by MAST and each of the comparison projects, and is distinguished from the number of CCROs that were actually delivered back to individual villagers by the conclusion of the project. The difference in the total number of CCROs delivered back to households, relative to the total number of parcels mapped and information collected for CCRO issuance, rests to some extent on a step in the process that is outside of the implementer's control: once DLOs have all of the components required to issue a CCRO, the documents are then signed and delivered back to villages for distribution to individuals.[8]

The study team considered using two alternative effectiveness measures: (1) the number of parcels mapped by the project, and (2) the number of CCROs delivered to project beneficiaries in villages. However, the qualitative data indicated that there were relatively small differences between the number

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[4] In the context of a land rights mapping and CCRO delivery project, this could include any fees that individuals or households must pay to complete the process or obtain the CCRO. At the time of this study, neither MAST nor any of the comparison projects required villagers to pay for CCRO receipt, although it is possible that future such projects may do so. This cost basket thus does not currently apply to the analysis for this study, but it is listed here for consideration in future such studies.

[5] This is the baseline year currently used to benchmark the CPI.

[6] As obtained from the WB's World Development Indicators database: http://data.worldbank.org/data-catalog/world-development-indicators

[7] The study team distinguishes between CCROs that had been prepared by the DLO and recorded at the district office, and those that had also been delivered to individual villagers. The number of CCROs prepared includes those where the district has received all of the necessary parcel and recipient information to prepare and issue a CCRO. The study team found that for all of the projects, there was a substantial difference between the number of CCROs that had been prepared for a given village, and those that had actually been delivered back to the village and received by individual households or land users. Reasons cited were generally due to additional costs to districts for CCRO document printing, which had not been covered by project funds. In some cases, this was due to villages not having the funds or completed construction of the required village registry to store the CCRO documents.

[8] However, this is not entirely out of implementer control in the sense that projects may choose to allocate additional resources to ensure this step is conducted.

of parcels mapped and CCROs prepared across MAST and the comparison projects. These differences were generally explained either by a land user's inability to resolve a parcel dispute within the allocated timeframe, or their lack of participation in the final verification steps required to issue the CCRO – either due to lack of interest or not being present in the village during the verification process.[9] Moreover, information on the number of parcels mapped versus the number of CCROs prepared was only available for some of the comparison projects. It could be argued that for any given project, there will be some targeted beneficiaries who will drop out of the process prior to its conclusion. However, the extent of dropouts could also be viewed as an indicator of the quality and effectiveness of the effort, since the reasons often appear to relate to issues that project service delivery purports to address, such as conflict resolution support, information provided on beneficiary selection and inheritance implications of the CCRO, or the availability of surveyors to map land when villagers are present. In this sense, the study team viewed the number of CCROs ultimately prepared, regardless of how many parcels were mapped, to be the stronger measure of overall effectiveness. Lastly, the number of CCROs delivered to project beneficiaries was not available as an effectiveness measure for this study,[10] since this number could not be reliably obtained. Qualitative data collection across the MAST and selected comparison project villages indicated that project documentation on reported number of CCROs referred to the number prepared and entered into the District's database, rather than the number that had been delivered to villagers (which was often much lower), for all of the projects.

To assess the time dimension of MAST relative to other approaches, the study considered several aspects. These options included the average time required to map individual parcels and the overall time required to accomplish key steps in the process (e.g., the average time to map parcels using the MAST and comparison project processes, and the time to process and prepare CCROs). Since none of the projects collected such measures related to time, the study team triangulated this information across the interviews with DLO staff and village leaders and beneficiaries. The study team found that ultimately it was not feasible to undertake a rigorous quantitative assessment of the time-effectiveness of MAST and the comparison approaches. This aspect of the study is therefore addressed in the qualitative results. In addition, since some villages were still waiting to receive their CCROs, this was not used as the ultimate measure of timeliness. It was factored into the quality analysis, however, since delivery of the CCROs to individuals is a key objective of the process and a crucial element of the overall theory of change for improved household tenure security and economic wellbeing through customary land formalization programs.

CEA Data Collection

The study team carried out data collection for the CEA in three steps. First, the team conducted a desk review of available MAST documentation and the identified candidate comparison interventions to determine broad project comparability and drop any projects for which it was not relevant or feasible to conduct a more in-depth analysis.

Second, the study team contacted different project coordinators or points of contact to establish communication, explain the nature of the study, and request project cost and effectiveness information as well as any additional project information that was needed. This step included multiple rounds of

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[9] On the other hand, there appeared to be a greater difference in the number of villagers who were interested in having their land mapped and receiving a CCRO, but could not proceed to the mapping stage because they were unable to resolve boundary disputes, or resolve internal family disputes on land allocation, across all of the projects visited. While the number of interested potential beneficiaries who are not able to proceed to parcel mapping is clearly important, reliable measures of this were not available for this study. The supporting qualitative data collection did take this into account, however.

[10] Such differences appeared to relate to the extent to which projects facilitated final CCRO delivery activities in villages, and associated costs.

communication in some cases, and provided an opportunity to expand the pool of potential candidate projects by asking project coordinators to cite similar projects of which they were aware. The study team conducted this step together with a local land sector expert, who was able to provide additional support to contact and follow-up with the different individuals in the field.

Lastly, the team continued to follow up with the points of contact to obtain further clarification on project activities and cost information, as needed. The study team sought the following information across each candidate project to inform the decision on project inclusion for this study and to enable meaningful comparisons:

- Detailed understanding of project objectives, a disaggregated list of key project steps or activities undertaken, and the nature of work flow for the project.
- Detailed understanding of any key factors related to project targeting of particular districts, villages, or types of households.
- A description of the type of technology and process used to conduct land mapping, and the information storage and transmission platform used.
- Disaggregated cost information according to the basic ingredients categories, in as disaggregated a form as the project is able to provide.
- Total number of CCROs prepared per project village, as well as any additional interim or outcome information available that indicate project effects against intended objectives.
- Timeframe of project implementation and village and district names that were included.
- Total number of villages, households, and hectares per village that were covered by the project.
- Role of village officials and village households or CCRO beneficiaries in the CCRO service delivery process.

CEA Data Analysis

The CEA process consisted of four steps:

1. ***Organize cost information and harmonize data across the comparison projects***: The study team organized the cost information it collected from the different projects into a cost matrix of the identified ingredients categories, based on the budget line descriptions provided by the projects. Where categorization was unclear, the study team communicated with different project coordinators and team members to obtain clarity and ensure that line items across different projects were consistently allocated to the same ingredients category. In some cases, the study team made pre-comparison calculations to bring data from the various projects to the point where direct comparisons could be made across them. The study team made any assumptions explicit, and provided a summary of how it ultimately allocated line item costs across the different projects to the different ingredients categories.
2. ***Select effectiveness measure(s):*** The study team selected the most appropriate measure(s) of project effectiveness based on the available documentation obtained from MAST and the comparison projects. As noted above, the study team used the number of CCROs prepared as this is a straightforward measure of the intended outcome of a land rights mapping and CCRO delivery project. It also provides a clear comparison point from a programming perspective.
3. ***Compute cost-effectiveness ratio:*** The cost-effectiveness ratio is obtained as the Net Cost / Program Effect, which yields for this study the incremental dollar cost to sensitize project beneficiaries, map each additional parcel, document user rights, and prepare the CCRO document. This measure was used to inform how MAST compares, from a cost-effectiveness standpoint, with alternative project approaches to achieve customary land rights documentation and CCRO delivery to households.

4. *Sensitivity analysis:* The CEA exercise involves making certain assumptions on both the cost and the effectiveness measures, particularly due to the level of disaggregation (or lack thereof) of some project activities and varying levels of certainty for some of the cost elements that were available from comparison projects. In addition to making such assumptions explicit in the analysis, the study team conducted a sensitivity analysis, which varied the values for inputs in order to demonstrate the extent to which results may be sensitive to assumptions made (e.g., estimating travel or personnel costs where such information was incomplete), and to generate a reasonable range of estimates on the cost per CCRO prepared.

Given the lack of precedent for detailed analyses of per-parcel costs and associated quality of customary land formalization efforts, the study team aimed to describe the cost comparisons as systematically as possible, and also note the challenges encountered with the adopted approach. In that sense, this initial exploration of a cost-effectiveness accounting, together with quality considerations, may also serve as useful entry point for future efforts to draw on or improve.

Qualitative Approach to Assess Quality Dimensions

While cost is a crucial consideration to inform scaling up possibilities for the MAST pilot, a meaningful comparison to alternative approaches must also extend to other dimensions of the process. Different approaches to formalizing land rights may vary in terms of "quality" aspects, such that lower costs may imply a less thorough approach that ultimately provides less value. To explore the quality of customary land mapping and CCRO delivery via the MAST process relative to comparable efforts in Tanzania, the study team undertook a companion qualitative data collection effort. While the CEA may indicate the most parsimonious approach required to prepare each additional CCRO, the qualitative component provides a means to understand in greater detail the quality of service delivery under the MAST approach relative to others, how this may relate to resource allocation or cost differences, and identify where there may be opportunity to efficiently maintain or strengthen this process under more widespread implementation. The goal of this qualitative effort was therefore to learn about each project's approach to issues of transparency, inclusiveness, data collection and transmission quality, and required time and personnel dimensions, with respect to customary land mapping, verification, and CCRO preparation and delivery, and to understand if and how any such differences might relate to resource allocation or cost differences. The incorporation of this quality dimension for the study, and its integration with the cost-per-parcel analysis, also reflects donor interests in finding low-cost solutions that are also socially responsible and sustainable.

The study's approach for the qualitative component was as follows, and is further detailed in the ensuing sections:

- *Develop classification criteria* across transparency, inclusiveness, quality, time, and personnel dimensions, which will be used to classify each village case.
- *Qualitative data collection* in the second and third MAST pilot villages and four comparison project villages, using semi-structured KII and GD instruments (see Annexes C and D for data collection protocols and guides), to enable case classification along quality dimensions and obtain supporting information for interpretation.
- *Qualitative content analysis* of KII and GD data, and integration of the qualitative findings with the CEA per-parcel cost results.

Develop Classification Criteria to Assess Quality Dimensions of CCRO Delivery Approach

Assessing the quality of CCRO delivery relative to its cost is somewhat challenging, because 'quality' is itself an open-ended concept. To assess the quality of each project according to each of the three outcome dimensions, the study team established a set of criteria for each dimension *a priori*, and developed a classification matrix that it used to assess each comparison case (see Table 3). The information to inform each assessment was determined from the village-level KIIs and GDs for MAST or each comparison project, and triangulated with the KIIs with DLO staff in the respective district where the project was implemented. This approach aimed to identify broad differences across the projects along the three quality dimensions and overall, and to gain an understanding of what contributed to such differences and whether they may relate to per-parcel cost information obtained through the CEA.

The study team established criteria prior to qualitative data collection. However, it further adjusted some of the classification criteria during data collection as follows, to reflect important distinctions that emerged from the initial discussions with respondents, and to better meet study objectives.

- *Information Accessibility:* Initially the criteria for this included a focus on the internet availability of the collected land information, and the accessibility for individual land users (or CCRO beneficiaries) to access such information via the internet. Although this function is available via MAST and thus of interest to USAID, it was quite evident during data collection that beneficiaries did not consider the internet availability of land user information to be of strong interest or relevance in the current Tanzanian village context. For example, although GD participants in the MAST villages recalled being told that their user information was available on the internet, in practice they did not consider this relevant to their needs with respect to accessing their land information, and expressed that it would be much more difficult for them to try to obtain their information through the internet than to check the village or district land registry. Given this, the study team removed the focus on internet availability of land records from the information accessibility criteria, as scored from the perspective of village land users.
- *Ease of Use Criteria:* The study team modified this to reflect the perspective of DLO staff in terms of their ability to use the land data collected according to their land administration needs.
- *Personnel Requirements:* The study expanded this to take into account separately the requirements for the technical work of land mapping for individual parcels in villages, and the non-technical work associated with supporting the mapping. It also modified the scoring for this so that it was drawn from the perspective of whether it would be feasible for villagers to fill any of the technical roles related to land mapping in a village that were used by the different processes. To determine this score, the team drew on villager perspectives put forth in the GDs as well as how likely or realistic it would be for villagers to implement the technology accurately, based on the knowledge of study team members of the skills and training required for each technology used, together with district or villager experiences via previous or similar efforts.

TABLE 3: CLASSIFICATION MATRIX FOR QUESTION 1B

Dimension/ Quality Criteria		High (score: 4-5)	Medium (score: 3)	Low (score: 1-2)	Information Source for Scoring
I. Transparency and inclusiveness of the mapping and verification process	*Inclusive sensitization*	• The project included widespread information and sensitization outreach targeted to all villagers and including distinct efforts to reach vulnerable groups.	• The project included some information and sensitization outreach but did not reach all villagers or specifically aim to reach vulnerable groups.	• The project did not include widespread information and sensitization outreach targeted to all villagers and including distinct efforts to reach vulnerable groups.	• Village KII and GD
	Broad understanding of process	• Nearly all villagers (at least 90%) understood the mapping and verification process.	• Many villagers (between 50-90%) understood the mapping and verification process, but others did not.	• Less than 50% of villagers understood the mapping and verification process.	• Village KII and GD
	Broad consultation	• The verification process included consulting nearly all villagers, including men and women, and members of vulnerable groups.	• Verification included a process of consultation, but some villagers were not aware of the process, including members of vulnerable groups.	• The majority of villagers were not consulted about verifying claims, including many members of vulnerable groups.	• Village KII and GD
	Fairness of verification and dispute resolution process	• Nearly all villagers perceived the verification process and approach to resolving disputes as fair.	• Many villagers perceived the verification process and approach to resolving disputes as fair, but others did not, including members of vulnerable groups.	• Less than 50% of villagers perceived the verification process and approach to resolving disputes as fair.	• Village KII and GD
	Effectiveness of verification and dispute resolution process	• Nearly all villagers perceived the verification and dispute resolution process as effective; all or nearly all disputes that arose during verification were resolved in a way that did not prevent households from receiving CCROs.	• Many villagers perceived the verification and dispute resolution process as effective, but others did not, including members of vulnerable groups; with some exceptions disputes that arose during verification were resolved in a way that did not prevent households from receiving CCROs.	• Less than 50% of villagers perceived the verification process and approach to resolving disputes as effective; many disputes that arose during verification that were not resolved and prevented households from receiving CCROs.	• Village KII and GD
II. Quality of the land information system (data	*Accuracy*	• District staff and villagers have high confidence that the information	• District staff and villagers have some confidence that the information held in the land	• District staff and villagers have low confidence that the information held in the land	• Village KII and GD • DLO KII

Dimension/ Quality Criteria		High (score: 4-5)	Medium (score: 3)	Low (score: 1-2)	Information Source for Scoring
collection and transmission) in terms of accuracy, functionality, ease of use and accessibility		held in the land information system is secure and reflects reality.	information system is secure and reflects reality.	information system is secure and reflects reality.	
	Functionality	• District lands staff report few and only minor problems accessing and changing user land information in system.	• District lands staff occasionally encounter major difficulties in accessing and changing land records.	• District lands staff frequently encounter major difficulties in accessing and changing user land information.	• DLO KII
	Ease of use	• The process to access land information records from the system is clear and feasible for typical district staff, to use for their land administration needs; it requires minimal training by peers to learn.	• The process to access land information records from the system requires substantial training, but with training system use is feasible for typical district staff, to use for their land administration needs.	• The process to access land information from the system is unclear and infeasible for typical district staff, for their land administration needs; challenges not easily resolved with peer-to-peer training.	• DLO KII
	Conformance to standards	• Accuracy and functionality of the data exceeds MLHHSD requirements.	• Accuracy and functionality of the data meets MLHHSD requirements.	• Accuracy and functionality of the data fails to meet MLHHSD requirements.	• DLO KII
	Information accessibility to village land users	• Detailed land information sufficient to meet a village landholder's typical needs is easily accessible; villagers report very few or no concerns over access and/or the information content that is available.	• Some but not all of the land information sufficient to meet a village landholder's typical needs is easily accessible; villagers report moderate concerns over access and/or the information content that is available.	• None of the land information sufficient to meet a village landholder's typical needs is easily accessible; villagers report serious concerns over accessing land information, and/or information content.	• Village KII and GD • DLO KII
III. Implementation requirements in terms of time and personnel at both the village and district levels	Reasonable time to implement	• Time required to survey a typical village (400-700 HHs) is less than one month.	• Time required to survey a typical village (400-700 HHs) is between one and two months.	• Time required to survey a typical village (400-700 HHs) exceeds two months.	• Village KII and GD • DLO KII
	Feasible personnel requirements	• There are few difficulties recruiting enough personnel with the qualifications needed to implement the methodology	• There is a shortage of personnel with the qualifications needed to implement the methodology; there may be some difficulties fielding multiple teams for large scale implementation.	• There is a shortage of personnel with the qualifications needed to implement the methodology; this is likely to significantly inhibit implementation on a large scale.	• Village KII and GD • DLO KII

Qualitative Data Collection Approach

Data collection and analysis for the qualitative component of this study was based on two primary sources: KIIs and GDs (see Annexes C and D for the KII and GD protocols and guides).

- **KIIs**: the study team conducted semi-structured interviews with DLO staff and village government officials. The team structured the KII protocol to gather detailed information about each of the classification criteria listed in Table 3, from the perspective and experience of the respondent. The types of respondents are provided in Table 4. The study team conducted the KIIs in Swahili.
- **GDs** with project beneficiaries, non-beneficiaries, and village officials: the study team convened groups of 10 to 15 villagers to gather firsthand information from respondents involved in the land mapping, verification, and/or CCRO delivery process. The team conducted GDs in Swahili utilizing a semi-structured discussion guide. The team structured the GD protocol to obtain information about each of the classification criteria listed in Table 3, enabling the study team to assess GD responses for each group across each criterion.

The study team ensured that the views of subgroups of interest, such as women, widows, and pastoralists, were reflected in the discussion and analyses, to the extent possible. The team recorded KIIs and GDs where appropriate, after obtaining consent by the respondents, and took extensive notes during each KII or GD. The GD facilitator and notetaker were both fluent in Swahili and English. KII and GD analyses included a summary of common themes that emerged in response to each topic, in addition to outlier responses, highlighting the range of responses and experiences that were conveyed by respondents. Analyses are supported by quotes from respondents in this report, to illustrate key points.

Qualitative Data Collection Team

The data collection team for the qualitative component consisted of Team Leader Dr. Lauren Persha of NORC at the University of Chicago, Evaluation Specialist Gwynne Zodrow of MSI, Tanzanian Expert Gerald Usika, and a Land Officer from MLHHSD who served as a liaison for the team with DLO representatives and was familiar with MAST implementation and each of the comparison projects.

District and Village Selection

According to the information obtained by the study team, the 14 comparison projects covered 155 villages (see Table 1). However, *a priori,* 95 of the MLHHSD villages in the Mvomero project were excluded from the pool of potential villages for qualitative data collection because CCRO delivery was not conducted in most of the project villages, and detailed information was only shared for the first 2 villages in which individual parcel mapping and CCRO delivery was done. The 18 WB PSCP villages were also excluded from the list of potential villages for qualitative data collection because village names were not provided, and the district locations for that project in western Tanzania would be logistically difficult to visit during the field time allocated for the study. The study team drew on the resulting pool of districts and villages to select the four districts for the quality dimensions data collection, identify alternate districts if needed, and then generate a list of candidate comparison villages in each of these districts.

The team prioritized districts and villages for qualitative data collection on the basis of their similarity to the MAST pilot village and project context. The project, district, and village context factors taken into consideration for the selection process are listed below.

1. *Project factors*
   - (P1) Similar land mapping technology as MAST: handheld Global Positioning System (GPS) used in conjunction with topomaps, satellite imagery or aerial photos
   - (P2) Similar set of project activities and intensity of effort devoted to each (although timing and process for each step may differ across projects), including:
     - Awareness raising and sensitization
     - Village land use planning[11]
     - Parcel mapping and adjudication/disputes resolution
     - Field verification processes
     - CCRO registration and issuance[12]
   - (P3) Project scale within the selected district: few villages versus widespread effort
   - (P4) Village selection criteria or targeting, especially with respect to existing land conflicts
   - (P5) Household targeting within project villages:
     - Project aims for broad coverage of most/all households or a more selective effort?
     - Anyone can participate, or only those who meet particular criteria?
   - (P6) Detailed cost information that can be disaggregated across CEA ingredients categories

2. *District context factors*
   - (D1) DLO and District Office land capacity and experience
   - (D2) District accessibility to Iringa District or Dar es Salaam[13]
   - (D3) Project involvement by current personnel in the DLO, to ensure the ability to obtain implementation information about the project from district staff

3. *Village context factors*
   - (V1) Proximity to district center[14]
   - (V2) Village was not first or last one completed by the project, to ensure representativeness of typical implementation
   - (V3) Primary land uses
   - (V4) Primary economic and livelihoods activities
   - (V5) Socio-economic and demographic characteristics (relative poverty and education level)
   - (V6) Types and relative level of pre-existing land rights issues and disputes (e.g. large-scale investment activity or concerns, intra-household or inter-village boundary disputes, inheritance disputes, farmer-pastoralist disputes)[15]
   - (V7) Similar topography/accessibility of parcels within the village as MAST pilot villages[16]
   - (V8) Parcels mapped per village and number of CCROs planned for household delivery was similar to the MAST pilot village effort, or at least exceeds 100 plots surveyed and CCROs issued (to exclude villages where the comparison project effort was very limited in scope)

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[11] MAST was designed to operate after VLUPs had already been finalized in a village. In some comparison projects identified for this study, the VLUP effort was folded into the project, however, because the costs associated with that effort were itemized, the study team will be able to exclude them as needed in the final CEA results.

[12] Although CCRO delivery is an overarching objective for all, the projects differ in the extent to which they funded and facilitated CCRO registration and issuance. Such differences will also be considered and adjusted for in the final CEA results.

[13] Included only to ease the field logistics for the data collection; all else equal, districts that were close to Iringa or Dar es Salaam were selected, to complete the field work in a timely manner.

[14] Included for logistical purposes and to ensure similar accessibility to the DLO for the comparison and the MAST villages.

[15] All of the selected villages had these issues, although there was some variation in the extent of certain kinds of conflict.

[16] In practice this was difficult to control for adequately, since some of the districts were located in areas with more topography than others, while in other accessibility issues related more to the season during which the mapping was conducted.

The study team collected qualitative data in four districts: Kilolo, Mvomero, and Rufiji[17] – which covered four of the comparison project approaches – and Iringa Rural District, where MAST was implemented. Across these districts, the team collected qualitative data in six villages (two MAST villages and four comparison project villages). The team conducted 1 GD and 1 village KII in each of the two MAST villages, and in one village per selected comparison project. Because the four selected comparison projects were located in three different districts,[18] the team conducted KIIs with a total of four DLOs. The KII and GD respondent categories are summarized in Table 4.

TABLE 4: RESPONDENT TYPES

KII Protocol Category	# of KIIs/Respondents
1. Village Chairman, Executive Officer or other village government representative	6 (one each in MAST pilot villages 2 and 3, and one in each of 4 comparison project villages)
2. District Land Officer	4 (one in the MAST pilot site district, and one in each of the 4 additional districts in which selected comparison project villages were located)
GD Protocol Category	**Total # of GDs**

Cross-section of 10-15 land users who:
   a. Had land mapped through MAST or a comparison project (regardless of CCRO receipt); or
   b. Had not participated, or dropped out prior to CCRO preparation.
	6 (one each in MAST pilot villages 2 and 3, and one in each of 4 comparison project villages)

The study team selected the four comparison project districts for the qualitative component in advance. The MLHHSD representative traveling with the team facilitated introduction to each of the DLOs, and to help schedule and arrange the village KII and GD. DLO representatives were contacted prior to the arrival of the team in each district, to help facilitate the process and enable the team to adhere to the schedule.

To select a representative village for each project, the team prioritized up to four candidate villages per selected district and comparison project prior to the fieldwork, based on context similarities with the MAST pilot. The team selected the final representative village for the qualitative data collection per district during the KII with DLO staff. The team's aim for village selection was to collect data on quality dimensions in villages that were similar to MAST villages in terms of demographic, geographic, and land context, and were also representative of typical implementation processes for each of the comparison projects. This approach drew on the expertise of the district staff involved in each project to select a village that represented a typical implementation case for the project. This selection approach insured against the emergence of unexpected context differences that could become apparent only during the village visit itself, which could result in a case no longer meeting the criteria for inclusion in the study.

Once villages were selected, the study team worked with the DLOs and community leaders to schedule the village KII and organize the village GDs. GD participation was also based on the availability and willingness to participate of villagers. All GDs included a range of villagers who had diverse experiences

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[17] The team initially selected four comparison projects across four districts. However, planned fieldwork in Kilombero District was replaced with Mvomero District due to a change in availability of the Kilombero DLO. As a result, the team included two land formalization comparison projects for Mvomero District,

with the project, either as beneficiaries or non-beneficiaries. Summary statistics on the GD participants are presented in Annex F.

FIGURE 1: STUDY DISTRICTS FOR QUALITATIVE DATA COLLECTION
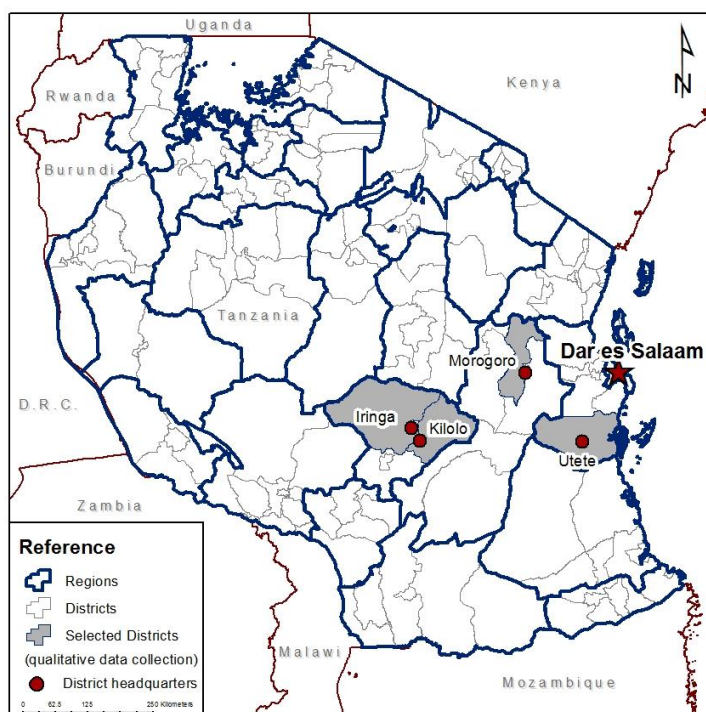
The team first conducted district KIIs, followed by the village KII or GD on the same day or the following day, depending on timing and participants' availability. On average, KIIs took about one hour, and the GDs about an hour and a half. All interviews were conducted in Swahili with a native Swahili-speaking moderator and a Swahili/English-speaking notetaker. Each GD aimed for 10 to 15 respondents, and for gender and age balance. When possible, a small number of project participants (villagers in either technical or non-technical roles) were included in the GD, including MAST intermediaries or Village Land Use Management Committee (VILUM) members.

KIIs at the district level included district land officers and/or their subordinates, who were familiar with the project and had been involved in its implementation. Additional DLO staff joined the District KII conducted in Mvomero Distict, due to their interest in MAST. The team generally conducted village KIIs with the village *mwenyekiti* and *mtendaji*, and in four of the six villages several hamlet (*kitongoji*) leaders also participated.

Qualitative Data Analysis

The study team assessed each comparison case according to the classification criteria in Table 3, triangulated from information obtained from each KII and GD conducted for that case, and the KII with the DLO from the respective district. This was supplemented by descriptive anecdotes to illustrate reasons for scoring on particular criteria, or highlight differences relative to the MAST approach. Where classification differs across KIIs or the GD, this is noted and the study team provides justification for the final classification adopted. Individual criteria listed in Table 3 were also assigned a 1-5 rating that corresponds to a Low to High spectrum, and an overall rating for each case. This was done to facilitate systematic comparison across cases, and integration of the qualitative and quantitative data. The team conducted scoring across the qualitative criteria in Table 3 after completing each set of interviews for a given project (i.e., DLO, village KII, and village GD). The team analyzed interview data though discussion of the summarized information, and listed key determining factors during scoring, to justify the scores. Lastly, the team analyzed data from the GDs and KIIs using content analysis techniques, coding text according to key themes of interest across the KII and GD participants. Responses related to each theme are summarized, and quotations from respondents are included in this report to illustrate key

findings. Throughout the analysis phase, the team identified where male/female responses and experiences appear to be parallel and where they differed, particularly with respect to participation from an access to land rights and perceived transparency and inclusiveness of the mapping and verification process, and land information ease of use and accessibility.

Integrating Quantitative and Qualitative Results

This report presents the cost-per-parcel results and cost matrix alongside the quality classification for the MAST pilot and comparison cases, to provide an integrated assessment of the cost effectiveness of the MAST approach. The summary analysis discusses the advantages and disadvantages of the MAST process relative to other approaches, from both cost and outcome quality perspectives, and comments on the overall implications for the potential adoption of the MAST approach for formalizing land rights in Tanzania on a wider scale.

Study Limitations and Risks

A key risk for the CTE study related to the availability of sufficiently detailed project and cost information from the identified comparison approaches, which could affect the accuracy of the cost-per-parcel estimates obtained. The study team obtained sufficiently detailed cost information to conduct a credible cost-per-parcel comparison, however each of the comparison projects reported costs and labeled line items differently. While the study team sought clarifications from project points of contact, some assumptions were necessary to proceed with the analysis. These are noted in the report, and caveats are made where appropriate.

Response and recall bias was a potential limitation for the qualitative component, given that the GDs and KIIs relied on self-reported data. Participants may not have accurately remembered all of the timing or details of the implementation of the different activities, especially for participants of comparison project approaches that took place several years ago. Their responses may also have been influenced by social or cultural bias, and it is possible that they may have felt obligated to give responses they felt were expected of them. Although this limitation is a possibility for all qualitative data collection, the study team sought during the field work and consent process to mitigate these potential biases to the extent possible, by being clear about the nature of the study and its intended uses, as well as the nature of respondent participation and rights. The study team also relied on triangulation of data from multiple sources, to reduce the influence of any potential responses biases in the analyses.

Lastly, there is a possibility that the findings from this study could have limited generalizability, since they are based on results from a small number of comparison cases. Although the study aimed to select comparison cases that are considered typical for the comparison project approach, and also have context similarity with the MAST process, the limits of generalizing widely on the basis of a small set of comparison cases should be borne in mind.

OVERVIEW OF COMPARISON PROJECTS

This section provides brief summaries of each of the comparison projects. Table 5 describes key context and project approach similarities and differences across the MAST and selected comparison project villages from which the team based the qualitative analysis. To help situate the ensuing quantitative and qualitative results, Table 5 also presents for these villages the number of CCROs prepared in each

village, time to achieve key steps in the process, and overall time to CCRO receipt from the perspective of village KII and GD participants.

Tanzania Property and Business Formalization Programme

MKURABITA is a land use formalization program that operated from 2008 through 2012 in at least 51 districts in Tanzania, with a phased roll-out across a different set of districts each project year. It typically implemented CCRO delivery in 3 to 10 villages per district, with more extensive coverage in up to 25 villages in some southern corridor districts such as Mufindi, Njombe, and Rungwe. As of May 2016, MKURABITA had prepared VLUPs in at least 108 villages, and conducted parcel surveying on 106,629 plots. According to project records, it had prepared at least 63,273 CCROs by May 2016. In terms of the technology to map parcels, the project used handheld GPS together with topomaps. Teams of three district land surveyors conducted parcel mapping in villages, accompanied by two to three Village Land Use Committee members. Each land user's supporting information for the CCRO document was collected separately and entered into an Excel database. According to KIIs with DLO staff, MKURABITA aimed to work in villages with farmer-herder land conflicts in Mvomero and Rufiji Districts, since clarification of customary land rights and boundaries via the CCRO process was anticipated to help reduce such conflicts.

The comparison cases for this study were drawn from project villages in Rufiji and Mvomero, two of the districts completed during the first year of MKURABITA implementation in 2008-09. The scope of the MKURABITA effort in each of these districts was similar to that of the MAST villages. In Rufiji district, VLUP and CCRO delivery under MKURABITA took place in 7 villages, with a total of 3,340 plots surveyed and 1,995 CCROs prepared by May 2016. In Mvomero, VLUP and CCRO delivery took place in 4 villages, with a total of 2,714 parcels mapped and 2,064 CCROs prepared. MKURABITA also facilitiated VLUPs in two of the four villages. The effort in the selected comparison villages is also comparable to the scope of the MAST effort at the village level. In Nyamwege village (Rufiji District), the project conducted land adjudication and surveying in 549 plots and prepared 437 CCROs. In Melela village (Mvomero District), the project surveyed and plotted 740 parcels,[19] and 327 CCROs had been issued to villagers by May 2016.

Haki Ardhi

The Haki Ardhi-supported village land use planning and CCRO delivery project was implemented in three districts (Kilolo, Mufindi, and Mkinga), covering a total of 18 villages. In Kilolo District, the project worked in 10 villages. The project aimed to sustainably protect villager land, guarantee access and land ownership rights, secure land investment interests, and address problems with land conflict, deforestation, and unsustainable cultivation. The project aimed to provide CCROs for 50 to 350 parcels in each village, with the number determined by the project budget. Haki Ardhi differs from the other comparison projects in this study, in that it did not aim for village-wide CCRO coverage or to map land for all interested villagers. Villages had flexibility to decide which parcels would be surveyed, while the project provided selection guidance that aimed for broad inclusion of parcels owned by men and women, distribution across different hamlets in the village, and consideration of vulnerable groups. According to KIIs with Kilolo DLO staff, village selection criteria for Haki Ardhi in Kilolo District was based primarily on three issues: (1) no unresolved boundary conflicts with other villages; (2) presence of outside pressures to invest in or acquire land; and (3) internal interest from villagers to obtain a CCRO.

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[19] The number reported by villagers in the GD was slightly different, at 769,

MLHHSD

The MLHHSD-supported land formalization project in 2006 to 2013 followed a similar process as MKURABITA, in terms of the technology and overall approach. It used handheld GPS to map villager land parcels, together with topomaps in a GIS to produce parcel maps for CCROs. It also drew on satellite imagery in some districts. The project collected information from land users separately, and entered this into an Excel database. According to KIIs with Mvomero DLO staff, the project aimed to work in villages with farmer-herder land conflicts.

TABLE 5: SUMMARY OF VILLAGE CONTEXT AND TIME TO CCRO PREPARATION

District	Iringa	Iringa	Kilolo	Mvomero	Mvomero	Rufiji
Project	MAST	MAST	Haki Ardhi	MLHHSD	MKURABITA	MKURABITA
Village Name	Itagutwa	Kitayawa	Lyamko	Lukenge	Melela	Nyamwege
Population	1,672	2,118	2,139	2,227	3,052	4,997
# of households	441	546	~560	~580	826	1,234
Distance to district town (km)	30	22	50	~100	35	32
Key village context	Good road access	Good road access	External land investment pressure, for tree farms; more isolated	Borders a sugarcane plantation; farmer-herder conflict; more isolated	Farmer-herder conflict; good road access	Forest and sugarcane cash crops; farmer-herder conflict; good road access
Year of land mapping	2015	2016	2014	2014	2009	2008
Sensitization and awareness raising	2 weeks	2 weeks	2 weeks	2 weeks	7-14 days	2 weeks
Time allotted for parcel mapping	1 month	~ 1 month	10 days per hamlet (fixed by project)	10 days per hamlet (fixed by project)	10 days	2 weeks
Mapping and verification time (includes district preparation time)	1.5 - 2 months	~ 3 months	1-2 months	5 months	Not available	1 year[1]
Time to receive CCROs, after verification	3-4 months	~5-6 months	3 months	3 months	~ 6 years	> 9 years
Total time from sensitization to CCRO receipt (from villager perspective)	5-6 months	8-9 months* (expected)	5-6 months	8 months	6 years	10+ years*
Land mapping team structure	8-15 trusted intermediaries from village	8-15 trusted intermediaries from village	3 survey experts from district, and 2-3 from VILUM	3 survey experts from district, and 2-3 VILUM	3 survey experts from district, and 2-3 from VILUM	3 survey experts from district, and 2-3 from VILUM

District	Iringa	Iringa	Kilolo	Mvomero	Mvomero	Rufiji
Project	MAST	MAST	Haki Ardhi	MLHHSD	MKURABITA	MKURABITA
Villagers involved in technical mapping roles	Yes	Yes	No	No	No	No
# of CCROs prepared	1126	1878	353	~250-500 (estimated)	769	437
Overall time per CCRO received[2]	0.2 days / CCRO	0.1 days / CCRO	0.5 days / CCRO	0.5 - 1.0 days / CCRO (estimated)	2.9 days / CCRO	> 8.4 days / CCRO

* Villagers were still waiting to receive CCROs at the time of the field work for this study, in part because they had not finished building the village registry required by GoT to store the CCROs.

[1] Three rounds of verification were conducted to correct errors, contributing to a longer time period relative to other villages.

[2] This is calculated similar to the overall cost-effectiveness measure, drawing on the villager's perspective on time to CCRO receipt. It is calculated as: the number of CCROs prepared/overall time from sensitization activities in village to CCRO receipt.

QUANTITATIVE RESULTS: COST-PER-PARCEL ANALYSIS

Summary of Quantitative Cost-Per-Parcel Results

Adjusted and Unadjusted Cost Estimates

This study reports two cost estimates: (1) the unadjusted cost-per-parcel for CCRO preparation, which draws on all of the budget data provided by MAST and each comparison project; and (2) the adjusted cost estimate that results from conservative assumptions to include missing information or exclude costs of non-comparable activities. For MAST, the unadjusted unit cost per CCRO prepared is $47.70 across the two MAST pilot villages, while the adjusted cost is estimated at $32.70.

Overall, the quantitative cost-per-parcel analyses suggest that there is fairly wide variation in the estimated cost per CCRO prepared across the different projects and districts. Some of this variation likely relates to missing cost information from some of the cases, or economies of scale that could be realized from implementation in multiple districts, even when the number of villages per district was small (although the analysis necessarily treated each district as a separate case). Across the 15 comparison projects and district combinations, the unadjusted[20] estimated cost-per-parcel ranges from $14.80 to $47.70[21] per CCRO prepared (reported in 2010 U.S. dollars; see Table 6 and Annex H).

While MAST is at the high end of this spectrum, the unadjusted figures reported here have several caveats, discussed below. After considering differences in the MAST structure, excluding VLUP and registry renovations costs, and varying assumptions on personnel and materials and equipment elements

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[20] Unadjusted estimates are based on the full budget information that the study team received for a given case, without excluding costs that relate to activities that MAST did not conduct (such as VLUP or registry renovation), or making other adjustments for MAST and comparison cases to estimate incomplete information or exclude less relevant costs.

[21] The calculated cost per parcel of $143.80 for one district under MKURABITA, Mvomero, was disregarded because although the project worked in 97 villages and aimed for preparation of around 145,000 CCROs, the qualitative data indicated that the actual scope of CCRO delivery was only 4 villages and 5,000 CCROs. However, it was not possible to separate out all of the cost information that applied only to the VLUP conducted across the 97 villages. The unadjusted cost of $143.80 per CCRO prepared is therefore not accurate.

from the comparison projects as part of the sensitivity analyses, the adjusted cost per parcel range is $9.00 to $35.70 per CCRO prepared. Within that range, the estimates for half of the cases come in under $20 per CCRO, and the remaining half range from $20 to $36 per CCRO prepared.

While the estimated cost of the MAST approach appears to be on the higher end of the comparisons, the MAST approach also appears to have provided CCROs to village land users substantially more quickly (see Table 5). For MAST, the overall per unit *time to initial CCRO delivery in the village* is estimated at 0.1 – 0.2 days per CCRO prepared, while it ranged from 0.5 to more than 8.4 days per CCRO prepared across the comparison project approaches. As discussed in the ensuing qualitative results, the MAST approach appears to score higher on key quality criteria, with potential efficiency benefits, and villagers more knowledgeable and trusting in the land formalization process.

TABLE 6: COST ADJUSTMENTS SUMMARIZED BY PROJECT AND DISTRICT

Comparison Project	District	CCROs Prepared	Total Villages	Year	Cost per CCRO (2010 dollars)	Adjusted cost per CCRO (2010 dollars)	Adjustments
MLHHSD	Babati	4400	4	2012	15.0	9.0	a
MLHHSD	Bagamoyo	4100	2	2006	32.0	9.3	a,b
MKURABITA	Kilombero	2678	2	2012	14.6	11.1	a
MKURABITA	Ludewa	2126	2	2012	19.6	15.4	a
MKURABITA	Mvomero	2064	2	2010	19.7	16.3	a
MKURABITA	Rufiji	1995	5	2009	22.9	18.9	a
HAKIARDHI	Mkinga	901	3	2015	14.8	21.5	c
MKURABITA	Mbarali	1463	2	2010	27.2	22.9	a
WB PSCP	Babati	17500	9	2010	29.3	24.5	a,b
HAKIARDHI	Mufindi	1313	6	2015	19.9	26.6	c
HAKIARDHI	Kilolo	1852	10	2015	23.3	30.0	c
WB PSCP	Bariadi	17500	9	2010	34.3	30.3	a,b
MAST	Iringa	3017	2	2015	47.7	32.7	d
MKURABITA	Sumbawanga	947	2	2010	42.3	35.7	a
MLHHSD	Mvomero	5000	97	2013	143.8*	143.8*	n/a

* This estimate is disregarded due the inability to separate out survey and adjudication costs for CCRO delivery in a small number of project villages, and those related only to the VLUP in other project villages.
a VLUP costs removed.
b Registry renovation costs removed.
c Personnel costs estimated (staff increased)
d Personnel staffing effort reduced by 50 percent; overhead costs removed.

Project and Village Context Considerations

The nature and implementation structure of the MAST pilot involved some costs that may be redundant or unlikely to be present under a more DLO-embedded implementation. For example, as a pilot, MAST continued to develop and improve on the smartphone mapping technology as it embarked on piloting the parcel mapping and CCRO delivery process in villages. Although much of this process was likely learned through the MAST pilot in the first village (which is excluded from this analysis), pilot processes in the second and third villages may also have required additional staff effort and time to refine workflows and systems.

The MAST pilot also worked through multiple partners in Tanzania, which involved additional layers of project management and oversight, and included a national project team housed within the country office of an international non-governmental organization (NGO). It may be reasonable to assume that

the personnel structure under an implementation structure that is more embedded within districts, wherein staff roles are more integrated with their day-to-day land administration responsibilities, could function with lower high-level management and oversight support costs. This was likely already the case for all of the comparison projects, given that they worked more directly through district and MLHHSD staff. To understand how a modified personnel structure might contribute to lowering the cost per CCRO prepared under the MAST approach, the study team reduced the personnel effort by 45 percent as part of the adjusted calculations, and conservatively excluded one high-level position in the personnel structure (at 10 percent effort). Collectively, this adjustment was estimated to reduce the personnel cost by 50 percent. The 10 percent fee to a partner country office was also excluded in the adjusted cost, to improve the comparability of the estimate, since a similar fee was absent from all of the comparison project budgets.

It is also expected that efforts that were smaller in scope, with fewer villages covered per district, would likely be costlier on a per CCRO basis, and this expectation was supported to some extent. Excluding the WB PSCP data, which uses a much more expensive technology and approach than all of the other comparison cases, all of the costliest approaches had worked in just two villages in a given district, and/or were implemented by NGOs rather than through the GoT. The small scope of such projects likely provides less opportunity for potential efficiencies to be realized at scale or through improved experience of the implementing team. Each village is likely to present new challenges, and district and project teams can probably only apply limited learning from the previous village experience when the sum of experiences is only two.

Several general factors related to project context may contribute to variability in the per unit cost of CCRO preparation across the projects and districts. Context factors can be particularly influential on the cost when the overall scope of the project is fairly small. Two such factors, which are intuitive but were also noted by study respondents, include village topography and the presence of protracted disputes. Parcels being located on areas with complicated topography, and villages that had more dispersed parcels, required substantially more time to complete parcel mapping in a village. Protracted disputes can take place around agreement between neighbors on parcel boundaries, decisions within families about the allocation of family land across different family members for the CCRO documentation, or in relation to broader land use conflicts in a village such as between farmers and herders. More protracted disputes require additional resolution time, but may be eased by the availability of staff with stronger mediation skills and/or training in land laws and implications of particular ownership or inheritance decisions. Inability to resolve disputes can also increase the time to complete mapping or, as a tradeoff, result in a smaller number of parcels and land users completing the process through CCRO preparation. Given limited project resources, the default approach seems to be to impose a fixed time window within which land users must resolve disputes, or be excluded from further steps in the CCRO delivery process. While the qualitative data indicated that this is typical, it also appears to be a substantial reason for having fewer CCROs than the projects sought to prepare.

Lastly, although costs appear to be fairly similar for the WB PSCP project, this effort was much larger in scale than the other comparison cases, and used a much more expensive and technology-intensive approach that drew on district-wide satellite imagery as part of the mapping. Although the project's overall costs are large, it was also likely able to take advantage of economies of scale from imagery purchase and processing costs that the other comparison cases, each working in only a small number of villages, would not have been able to realize under the same technological approach.

Resource Allocation Differences across Projects

There are also some interesting differences in how the projects allocated resources, which could relate to overall quality and sustainability of CCRO service delivery. However, some of the observed

differences stem from the various ways that projects aggregated and described costs for some activities, in ways that could not be further disaggregated for this study.[22] In terms of key patterns in resource allocation, some of the most notable differences are the proportion of resources devoted to training and workshops, which appears to have been higher for MAST and MKURABITA, and the generally large proportion of resources for personnel to support land formalization processes. Although the percent of resources spent on personnel costs varies across the projects, it is clear that personnel costs are a major component of each approach.

The qualitative data collection provided some opportunity to examine links to overall quality and the potential longer-term sustainability of anticipated outcomes, suggesting for example that the depth of sensitization efforts, and the time window made available for parcel mapping in a village, appeared to have quality implications. Thus, the extent to which MAST was able to allocate resources to conduct sensitization and training for trusted intermediaries, and fund a longer time period for teams to conduct mapping, adjudication, and verification work in villages, could be one reason why that approach appeared to fare well from a quality standpoint, despite the somewhat higher cost per CCRO prepared during the pilot stage. In other words, it may be that this somewhat higher cost could have knock-on effects for higher quality and overall project sustainability to meet intended household social and economic objectives beyond CCRO provisioning itself.

FIGURE 2: RESOURCE ALLOCATION BY INGREDIENTS BASKETS (ADJUSTED COSTS)

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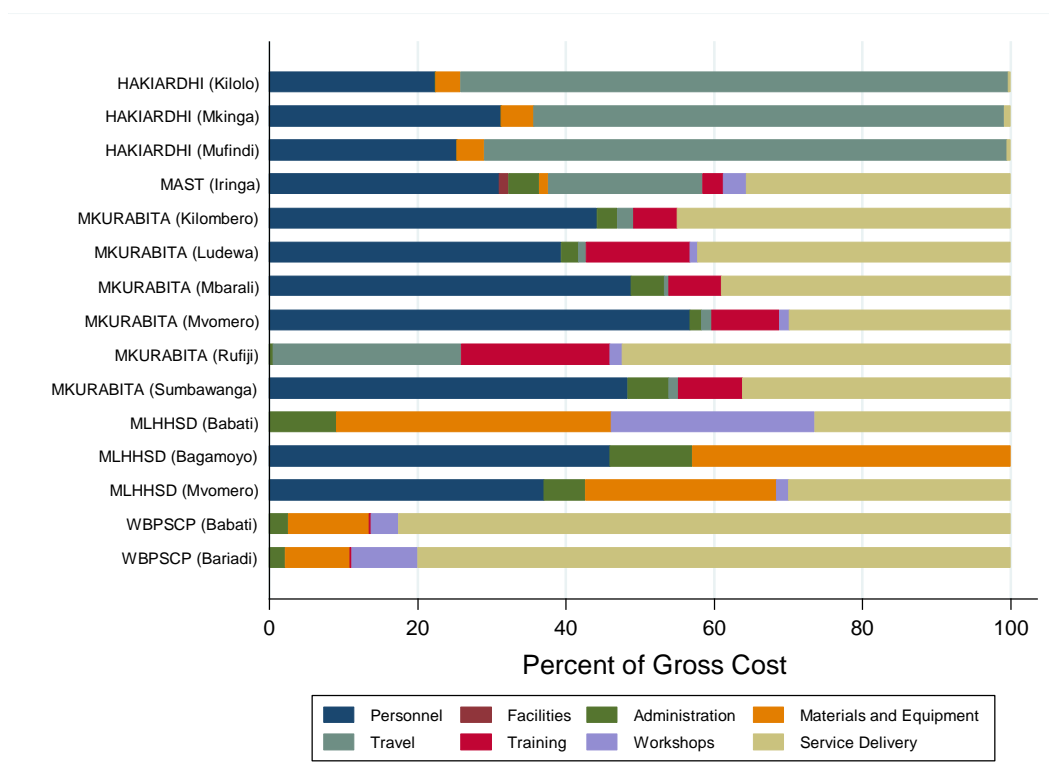
[22] In particular, the MLHHSD and MKURABITA projects appeared to pull some of the per diem costs into personnel and/or service delivery costs. WB PSCP folded personnel costs into each service delivery activity, which is why the relative allocation to service delivery appears so high for that project in Figure 2.

Cost Assumptions

To arrive at the final cost-per-parcel calculations, the study team made two major decisions on how to categorize certain line item costs into the different ingredients categories, to ensure consistency across the comparison cases:

1. Allocate all sensitization and awareness-raising activities and costs, whether at the village, district, or regional level, under the Workshops category. This decision essentially views sensitization activities and community-wide meetings as different from the later steps in service delivery. It also made it easier to identify approaches with greater relative allocation of resources into sensitization activities, and put this in context with quality issues that were examined during the qualitative data collection
2. Maintain all per diem costs and allowances paid in the MAST and comparison project budgets under the Travel category, although these could alternatively be viewed as personnel costs given Tanzania's per diem system.

The per diem system is widely used in Tanzania to compensate government and project staff for activities and work conducted outside of their home base, at rates established by the GoT. Allowances for village leaders or those who contribute time or labor to land formalization activities is also standard in the country. The system essentially serves to incentivize staff to conduct village-level work, or activities considered to be outside of their day-to-day duties. As a result, the staffing structure, the amount of time spent in villages for land formalization activities, and the number of district or NGO staff relative to villagers conducting project activities, can have substantial implications for the overall budget and ultimate cost-per-parcel in Tanzania. Keeping per diem as a travel cost made it easier to identify patterns in how this element may contribute to overall per-parcel cost effectiveness. These decisions on line-item allocations across ingredients categories did not impact the overall cost-per-parcel calculation, but did enable scrutiny of certain elements of the overall cost more distinctly.

The study team provides the following additional cost notes for the comparison projects:

- For MKURABITA, the study team did not separate the national team cost from other costs for Rufiji district, one of the initial districts under the project, and did not separate monitoring and supervision costs. The adjudication and surveying category also included costs for the plotting, verification, and registration of CCROs for Rufiji, while these were itemized separately for districts in later years of the project (Ludewa, Sumbawanga, Kilombero, and Mbarali). According to the project's own calculations, the average cost of formalization ranged from Tshs 25,532 to 41,226 per CCRO.
- For WB PSCP, costs associated with the demarcation and surveying of village boundaries were excluded, which the project did for several villages across the two districts that had not yet been surveyed. Also excluded were costs associated with processing and issuing a Certificate of Village Land. In addition, transport/travel costs for each of the service delivery activities, trainings, and workshops held under the project were not disaggregated in the budget information that was received. Thus, travel costs (including vehicle hire, project vehicle, and fuel and driver costs) are folded into the activity costs across each of the other ingredients categories for this project (for items in training, workshops, and service delivery), due to the inability to disaggregate these costs. This did not affect the calculation of the overall cost-per-parcel estimate, but it did render the resource allocation charts by ingredient basket to be less comparable for this project. Disaggregated personnel costs were also unavailable, and were instead folded into project service delivery costs.
- For Haki Ardhi, although some NGO staff time was also involved in project implementation, accurate estimates of the level of effort or cost of these staff were not available. The district-

level fieldwork indicated that the bulk of the project effort was conducted by DLO staff. The team assumed a conservative amount of higher-level project management oversight and support, and estimated personnel costs for that effort. However, full personnel costs were not available for this project, and actual costs may have been higher than the conservative estimates made. The sensitivity analysis provides further details on the assumptions made by the study team.[23]

- For MLHHSD, no training costs were reported in two of the districts. This may have been because the project followed MKURABITA in the same districts, and may have been able to draw on staff who had already been trained during the earlier process. As noted earlier, for Mvomero district, the project operated in 97 villages, but focused only on the VLUP in most of those villages. Thus, although the project budget is reported against 97 villages and a project target of 145,000 CCROs, in practice CCRO delivery was done in 7 of the 97 villages, providing 5,000 CCROs. However, cost reporting did not disaggregate land survey and adjudication costs by villages with CCRO delivery and those where only village land was surveyed for the VLUP process. Because those costs could not be disentangled, all of the clearly identifiable village land use planning costs were excluded, and cost was calculated per unit using the 5,000 CCROs that were indeed prepared (rather than the 145,000 initial target). However, this cost estimate is not considered accurate, and was disregarded as a comparison case.

Overall, the exploratory nature of this work highlighted some key challenges and contributors to uncertainty in trying to systematically compare per-parcel costs of land formalization efforts across comparison cases. Given the lack of precedent for existing work that clearly states how per-parcel costs of land mapping and customary land certification were obtained, or a standard approach to determining such costs, this initial effort may serve as a useful entry point for additional work to understand per-parcel costs of customary land formalization projects, and how such costs may relate to the overall quality and sustainability of the approach. Keeping such limitations in mind, this analysis aimed to state assumptions that were made and key sources of uncertainty, and to focus on estimated cost ranges rather than point estimates.

To improve on the accuracy of cost estimates, future efforts would likely benefit from tracking costs during project implementation with this explicit goal in mind, and perhaps also tracking effort and staff-days across each of the different steps in service delivery more explicitly to understand where greater time efficiencies might be gained. This would also include, for example, considerations of volunteer or unpaid personnel or labor contributions to activities, including that of villagers who may not always be paid allowances for their inputs, and accounting for materials and equipment used by the project that was not directly paid for with project funds.

Sensitivity Analyses

Across all the projects, budget information was generally more clearly itemized and reliable for four of the eight ingredients categories; thus, the team placed higher confidence in the reported costs for these categories: Administration, Training, Workshops, and Service Delivery. For such categories, costs tended to be more clearly itemized and reported in sufficiently disaggregated detail.

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[23] Drawing on information provided by the project on the total staff days and personnel roles, by each activity per village, the study team estimated travel and per diem costs as follows: since the project provided staff time by activity per village, the number of days over which each activity took place, and how many villages were completed per district, per diem was estimated on the basis of the total staff days across all villages per district. Qualitative data confirmed that the project spent fixed days of time per village for most of their activities. A per diem rate of Tsh 65,000/day was assumed. To estimate transport costs, the study team assumed 1 vehicle per team, nightly return to district headquarters from a given village, and a roundtrip fuel and driver cost at Tsh 50,000 per trip.

The study team placed lower confidence in budget information related to four categories that are more likely to include indirect costs that may not be as overtly tracked or quantified as part of project activities: Personnel, Facilities, Materials and Equipment, and Travel. For example, under Facilities, comparison project budgets tended only to include costs of registry renovations, and did not include costs for office space or building rental that their project budgets in some way likely supported. Under Materials and Equipment, it is unlikely that all projects reported on at least some equipment costs for items such as computers, smartphones, GPS units, GIS software, satellite imagery or other materials or equipment that DLOs already owned through other projects, but probably put to use for the current project. Due to higher uncertainty over the reliability of this type of cost information from comparison projects, most of the team's sensitivity analyses focused on varying assumptions for these costs, to understand their impacts on the overall cost-per-parcel estimate. The aim was to generate a reasonable range of estimates on cost-per-parcel across MAST and the comparison projects, which results from varied key assumptions on costs elements for which there was less certainty.

The study team made the following adjustments:

- *Exclude VLUP costs from all comparison project budgets.* The MAST approach was designed to conduct individual parcel mapping and CCRO delivery after a village completed the village land use planning process. All comparison projects took a combined approach (VLUP, followed by individual parcel mapping and CCRO delivery), as needed, if the village did not already have a VLUP. The VLUP costs were disaggregated and excludable for most of the projects but this was not possible in some comparison projects where some of the sensitization, mapping and adjudication costs were conducted or reported in tandem. For projects that did both processes, it is also likely that some of the time spent on awareness raising or training probably focused on elements of village land use planning in addition to individual parcel mapping and CCROs, and those associated costs could not be accurately removed from the other categories.
- *Exclude any costs associated with renovating or building village registries.* According to GoT regulations, a district must have a suitable registry space established prior to providing VLUP and CCRO service delivery to villages. In addition, a village must also have a registry cabinet or room that meets designated standards and must be verified and approved by the DLO, before the district will send CCRO documents for individual villagers to the village office. According to GoT regulations, villages are responsible for the cost of the registry. However, in some land formalization projects, donors fund this expense or some portion of it on behalf of a village. MLHHSD staff estimated that the cost to establish a full village registry room typically ranges from Tsh 1.5 to 2.0 million (inclusive of materials and labor).
- *Include an estimated national NGO staff/personnel cost for Haki Ardhi implementation*, to account for the unavailability of this information. To understand how inclusion of personnel costs may have affected overall cost-per-parcel, the study team loosely drew on the MAST staffing structure, as it also worked through an international and national NGO, to reasonably estimate salary and LOE for higher-level oversight of the project. This was estimated conservatively, and used to generate an estimate of the cost-per-parcel range that may be likely when inclusive of personnel costs for higher-level oversight.
- *Estimate income via project implementation (as an offset to the cost-per-parcel)*, for two cases where fieldwork indicated that villagers had been asked to contribute a small fee for CCRO receipt. Since village-level respondents told the study team that villagers had been asked to pay a small fee for CCRO receipt for the Haki Ardhi project (Tsh 3,000 for each individual who had any land mapped), and Tsh 10,000 per household to Mvomero District under the MLHHSD project, an estimate of that income was included for both districts. Because it was unknown how many households actually paid this fee, the team examined the total offset and change in cost per parcel under a range of assumptions for the percent of households complying with the fee.

Respondents indicated that the requested fee had generally been paid by households in the Haki Ardhi project, but generally had not been paid under the MLHHSD project – at least in the village where the study team collected data. In the case of the Haki Ardhi project in Kilolo, factoring in this offset at 90 percent of households assumed to pay the fee would bring the unit cost per CCRO prepared from $23.03 to $21.60 (2010 U.S. dollars), or a roughly 7 percent reduction in the unit cost.

- Per USAID's request to consider what MAST implementation costs might look like if implemented more locally, the study team made some assumptions about what local implementation might entail, informed by some of the cost information available from the comparison projects that involved Tanzanian nationals working under local NGOs and/or the local and national government. To understand how a modified personnel structure might contribute to lowering the cost per CCRO prepared under MAST, the study team reduced the personnel effort by 45 percent as part of the adjusted calculations, and conservatively excluded one high-level position from the personnel structure (at 10 percent effort). Collectively, the team estimated that this may reduce the personnel cost by 50 percent. To improve comparability, the team also excluded the 10 percent fee to a partner country office, since a similar fee was absent from all of the comparison project budgets.

FIGURE 3: ESTIMATED PER UNIT COST RANGE PER CCRO PREPARED

Cost per CCRO: Raw and Adjusted (2010 dollars)
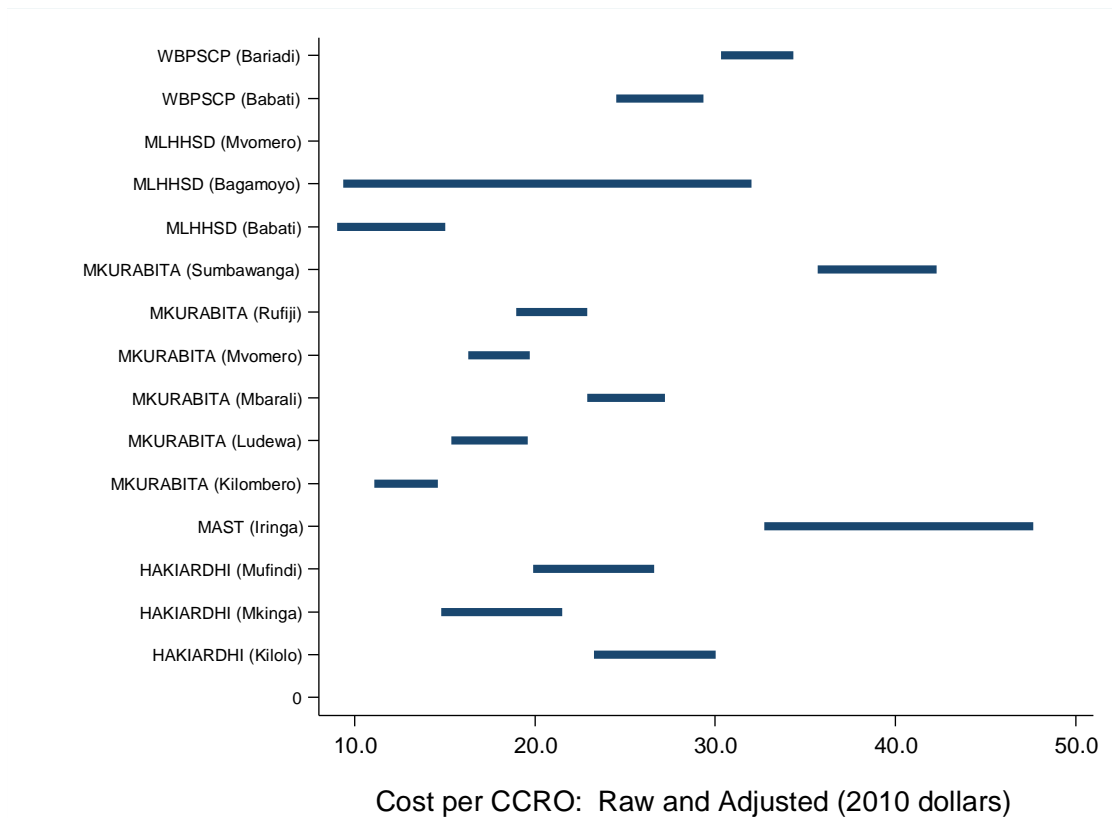
QUALITATIVE RESULTS: QUALITY DIMENSIONS OF LAND MAPPING AND CCRO DELIVERY APPROACHES

Overview of Quality Dimensions

In general, the KIIs and GDs point to several potential quality benefits and efficiencies of the MAST process relative to the more traditional mapping and CCRO delivery process adopted by the comparison projects:

- More extensive village sensitization efforts that devote time and resources to multiple sensitization events within a given village, and aim for broad knowledge on land laws, rights, and the land mapping and CCRO delivery process. While several of the other projects also devoted substantial resources to sensitization efforts, the additional hamlet-by-hamlet effort and training content adopted by MAST appears to have been effective at garnering greater inclusion and depth of knowledge.
- Use of the more accessible smartphone app to conduct integrated land mapping and digital collection of land user rights information according to GoT needs, rather than a handheld GPS coupled with a manual data entry system for recording the associated land user information. This has benefits in terms of more efficienct collection of information, direct verification by land users, and substantially reduced opportunities for errors in the associated user information that appear to be common in the uncoupled process. In addition, the smartphone app and mapping technology has a lower learning curve for villagers to become proficient, compared to the GPS-based mapping system. This enables the team structure for land mapping to be more participatory, involve less costly staff, and have greater flexibility for the timing and overall duration of when land mapping occurs in a village. In turn, this more participatory and flexible land mapping process appears to allow for more beneficiaries to have their land mapped, and may provide flexibility (and perhaps additional mediation resources) for more protracted disputes to be resolved within the time available for mapping.
- The technical land-mapping work conducted by trusted intermediaries. As noted above, this enabled the team structure for land mapping to be more participatory, work with less costly staff, and provided greater flexibility in the timing and overall duration of land mapping in a village. In turn, this more participatory and flexible land mapping process appears to enable more potential beneficiaries to have their land mapped, and may provide flexibility (and perhaps additional mediation resources) for more protracted disputes to be resolved within the time available for mapping.
- Integrated, electronic transmission of the parcel data and land user information by the MAST app into a database that is accessible to the DLO and automatically backed up. From the perspective of DLO staff, the efficiencies for data entry, and potential for reduced errors in land user information, appears to be a salient benefit of the MAST approach, particularly considering that the approach that is more commonly used for land formalization in Tanzania tends to draw on several steps that require timely and error-prone manual data entry and backup.

Together, these differences appear to contribute to somewhat higher quality of the land formalization process that was observed under the MAST approach, across each of the three sets of criteria examined (see Table 8).

TABLE 8: MAST AND COMPARISON APPROACH SCORING ON QUALITY DIMENSIONS

Criteria	MAST	MLHHSD	Mkurabita - Mvomero	Haki Ardhi	Mkurabita - Rufiji
I. Transparency and inclusiveness of the mapping and verification process					
Inclusive sensitization *(Villagers)*	5	3	4	3	4
Broad understanding of process *(Villagers)*	3	3	3	2	4
Broad consultation (verification) *(Villagers)*	4	3	4	3	4
Fairness of verification and dispute resolution process *(Villagers)*	4	3	4	3	3
Effectiveness of verification and dispute resolution process *(Villagers)*	4	3	4	4	3
Section Total	20	15	19	15	18
Section Mean	4.0	3.0	3.8	3.0	3.6
Section Score (%)	0.80	0.60	0.76	0.60	0.72
II. Quality of the land information system					
Accuracy *(District Officers)*	4	4	4	3	4
Accuracy *(Villagers)*	5	4	4	4	2
Functionality *(District Officers)*	3	4	4	2	3
Ease of Use *(District Officers)*	3	4	4	2	2
Conformance to standards *(District Officers)*	5	4	4	3	3
Information accessibility to village land users	4	2	3	3	2
Section Total	24	22	23	17	16
Section Mean	4.0	3.7	3.8	2.8	2.7
Section Score (%)	0.80	0.73	0.77	0.57	0.53
III. Requirements for implementation in terms of time and personnel at both the village and district levels					
Reasonable time to implement *(District Officers)*	3	3	3	3	3
Reasonable time to implement *(Villagers)*	3	2	2	2	3
Feasible personnel requirements *(District Officers)*	4	4	4	2	3
Feasible personnel requirements *(Villagers)*	4	2	3	3	4
Section Total	14	11	12	10	13
Section Mean	3.5	2.8	3.0	2.5	3.3
Section Score (%)	0.70	0.55	0.60	0.50	0.65
Overall Total	58	48	54	42	47
Overall Mean	3.8	3.1	3.5	2.8	3.2
Overall Percentage (%)	0.8	0.6	0.7	0.6	0.6

Color Codes:	Rating	Score	Percentage
	Good	4 or 5	75 - 100%
	Med	3	55 - 74%
	Low	1 or 2	0 - 54%

Transparency and Inclusiveness of the Mapping and Verification Process

A key element for each of the projects examined in this study was the village sensitization and awareness-raising process, which helped to educate communities not only on the process and approach, but also on villager land rights and the benefits and functions of the CCRO. While each project included a sensitization period, there were some variations in the approaches taken to reach community members, and the steps taken to achieve broad inclusiveness. The MAST approach appeared to be one of the most expansive in this respect, and GDs indicated positive knock-on effects for villagers' broader understanding of the mapping and verification process, overall feelings of inclusiveness and trust in the accuracy of the information, and understanding about their land record information accessibility. These are important achievements for the longer-term sustainability of the approach. Given that MAST appears to have directed a greater relative portion of its resources towards village-level training and workshops

than several of the comparison projects, such resource allocation may be important. Considering some of the associated differences observed around transparency and inclusiveness of the mapping, which are outlined below, this may also be an area where there is a clear quality and potential longer-term sustainability benefit to the relatively costlier MAST approach.

In terms of aims for inclusive sensitization, all of the projects undertook an initial village-wide meeting to inform the community about the project and the benefits of the CCRO. Following the community-level meeting, MAST and some of the comparison projects undertook additional steps to increase the reach of sensitization, and made targeted efforts to reach potentially vulnerable groups such as women, widows, the disabled, and elderly villagers who live alone. For example, according to the village GDs, MAST and at least one comparison project conducted additional sensitization at the hamlet level (a sub-village administrative unit), while another project trained and sent out community leaders to educate people on an individual level, especially for those who could not attend meetings (e.g., the elderly and disabled).

The general satisfaction with the level of sensitization of the MAST approach is illustrated in the following remarks from GD participants in two of the MAST villages:

> **Woman #1:** *For those who were in a sensitization seminar, they were asked to tell those who did not attend, so they received the messages, and told those who missed the seminars*
> **Facilitator:** *So apart from normal meetings, there were also sensitization seminars? Where did those seminars take place?*
> **Woman #1:** *There at the church.*
> **Facilitator:** *Do you have another opinion?*
> **Man #1:** *Yes, it is true that there were people unable to attend the meetings like disabled people, old people etc. The way to reach them was through sub village seminars, and during the mapping process, those people were involved.*
> **Facilitator:** *So if I understand, your explanation is that there were general meetings, then seminars in sub village level, and those who attended seminars cascade the messages to the sub village level.*
> **Man #2:** *What happened is that, in each village, they called a general meeting first, and then they selected 20 representatives to attend the seminar. Itagutwa, Makururu, Kipengere and Mrenge attended in this near church, for us who belong to Kipengere went to a different church. After getting that education, we were told to tell others and we did that. Then those officials came to each of the sub village to hold sensitization meetings at that level, to sensitize more particularly the disabled people. The arrangement was to ask a relative to oversee the mapping process on behalf of the disabled, and during the photo taking, the relative come back home and take a photo with the disabled.*
> **Man #3**: *I can give you a score that the sensitization did not reach only one out of 10 villagers.*
> Source: Itagutwa Village GD, Iringa District, December 2, 2016.
>
> **Woman #1:** *[When they arrived here, they used sub village leaders, so they informed the sub village leader in order for him to cascade the message to his/her people that the exercise will be here, so everybody has to attend]*
> **Facilitator:** *[so the leaders visited house by house?]*
> **Woman #1:** *[Yes, every house]*
> **Woman #2:** *[As mentioned, we have ten sub villages, so they called village after village. For the first day, they educated villagers on how to use that CCRO, after finishing that, there were villagers selected for land mapping and verification did receive the training to help them sensitize others.]*
> **Facilitator:** *[Do you have any different response?]*
> **Man #2:** *[First of all the project started in the village centre by calling the general village assembly, of which all the villagers were invited, then they told us we will get education through sub villages. That is each sub village there were 40 selected members who would get training on land use and land rights. That is what happened. All the 40 sub villagers got the training. After that, they started the mapping processes, and the land verification team got the training for them to be ready to support directly.]*

Man #3: [for sure there was adequate education provided. Not only that, they did training to 40 TOT members in the sub villages, but also they were provided with tools to use like books. In addition to that, these 40 people were told to be ambassadors. Forty people in a single sub village, it is enough of a campaign. Also, the sub village chairperson had a responsibility to explain and oversee each step. In my view, we got adequate education and awareness before the exercise]
Source: Kitayawa Village GD, Iringa District, December 3, 2016.

These approaches also expanded the time and availability for community members to become informed, including those who may not have been able to attend the initial meeting because of travel or other circumstances. Another difference was the meeting content and depth of information provided, with MAST and some of the other approaches appearing to include more detailed, or more effectively communicated, information on land rights and gender issues -- based on the degree to which participating villagers could describe the information and what they learned from it. These are key topics that help empower community members on their land rights, as well as to communicate what is permissible and what are the implications of various configurations of ownership and beneficiary selection that villagers might choose to list on their CCRO document.

Some of these differences were quite strongly apparent, with implications for broader land formalization project objectives. For example, it was evident during the GDs that the approaches that appeared to have taken more time to focus on land rights and gender issues during the sensitization, in addition to the mapping process and CCRO benefits, were likely more effective in empowering women to be named as owners on CCROs. This is important, as one of the key findings from the performance evaluation of the MAST pilot was the importance of the gender component and the focus on gender rights. Women expressed the importance of this to not only empower themselves, but also to educate the community about women's rights and inclusion into the CCRO process.

GD participants mentioned similar views for the comparison projects, where sensitization appeared to also include a strong gender component, and/or gender-targeted guidance during the training. For MAST, the positive implications for project gender objectives were also apparent. For example, in one comparison project village, respondents said that men were encouraged during the sensitization to list their wives on the CCROs. In another GD, participants noted that the guidance during sensitization encouraged husbands and wives to divide their land, and subsequently the village decided to require that every family receiving a CCRO should divide the land equally between the husband and the wife, with separate CCROs for each. Alternatively, GD responses in at least one of the comparison villages where the sensitization process did not have as strong a gender focus, or perhaps was not as effectively communicated, had followed traditional customs over land ownership and fewer women named as land owners during the CCRO process. GD participants there also mentioned that often wives were left off the CCROs even as beneficiaries to their husband, in favor of children named as beneficiaries.

There were few differences reported on how many people attended the sensitization, which villagers estimated at 70 to 90 percent across the GDs, or the overall understanding across the villagers, which tended to range from 80 to 98 percent. However, the approaches with more inclusive sensitization appeared to have yielded a stronger understanding of the process, overall land rights, and the benefits of the CCRO among villager participants. GD participants reported that those who did not attend were generally elderly, traveling, or not interested in the project. It was also commonly reported that women attended the sensitization meeting more so than men. This may have been especially true in villages with greater farmer-herder conflicts, where households often prefer or require men to spend more time on their farms guarding against herder incursions. Lastly, participants in several of the GDs also remarked on the time period allotted for sensitization, which ranged from 7 to 14 days across the comparison projects. Many respondents, including MAST village GD participants, did not think that the sensitization period was long enough (despite MAST's more expansive approach).

In terms of broad consultation during the verification process, respondents across the GDs did not take strong issue with this for any of the approaches. However, in comparison project villages that clearly had more protracted land conflicts across farmers and herders within their own village or across neighboring villages, a notable lack of inclusion was often apparent with respect to pastoralists or herders. Some of the reasons for this are somewhat beyond individual project control, and likely relate more strongly to underlying challenges around individual land formalization in the pastoralist context, where individual parcel registration is less congruous with typical pastoralist land use systems. For some projects, GD respondents[24] commented that herders/pastoralists showed little interest in the mapping and CCRO process, since they did not have farmland. It also appeared that project efforts to encourage their participation may have varied.

The extent to which individual parcel mapping will be harmonious with pastoralist land use needs is perhaps more strongly reliant on decisions that were made around collective land use and village grazing areas during the village land use planning process, which precedes the individual parcel mapping. Thus, where pastoralists' voices have been effectively included in the VLUP, there is likely to be a greater opportunity for productive inclusive of herders in the individual parcel mapping process. On the other hand, where pastoralists may have been disenfranchised through the VLUP process, the potential for ongoing land use conflicts and continued disenfranchisement may persist, and parcel verification absent the inclusion of herder members of the community may leave land use formalization processes less situated to reduce such land use conflicts.

The difficult nature of this type of conflict should not be underestimated; individual parcel mapping and CCRO delivery alone is unlikely to be sufficient to resolve such disputes. As one illustration of the protracted challenge that villages can face in this respect, and some of the ways that villages have approached this, one comparison project village chose to avoid the problem altogether by simply excising a predominantly pastoralist hamlet from its village at the time of the VLUP process. However, as GD participants from that village emphasized, removing this hamlet from their village did not resolve their land conflicts with pastoralists, as the herders who were excluded from the process did not recognize the individual parcel boundaries that were established through the mapping process, and there had been no change in farmer/herder conflict after the CCRO process.

In general, MAST GD participants thought that the verification and dispute processes were fair and effective. Across all village GDs, conflict resulting in no mapping or issuance of CCROs was reported to be low. MAST villages estimated this as 10 to 25 percent of people who were interested in having their land mapped, which may have been an overestimate given that respondents also indicated it was not a serious problem. In some of the comparison cases, respondents estimated the number as 10 to 30 households. Participants across all approaches mentioned that the common sources of conflict were over boundary disputes, and internal family disputes on how to allocate family land and name beneficiaries (which often appeared to relate to inheritance issues, or uncertainty over the implications of different naming decisions on the CCRO, for inheritance issues). Although projects seemed to have some influence in reducing conflict, this was most likely through conflict prevention rather than dispute resolution. None of the approaches, including MAST, appear to have distinct dispute resolution components or mediation resources. Instead they relied on villagers and community leaders to resolve conflicts on their own. Moreover, all of the approaches would not survey the parcel boundaries for a plot if there was any existing disagreement or conflict (although for some approaches, it was unclear whether the surveyor would be in a position to know this at the time of mapping, since neighbors or land owners were not required to be present). Overall, however, GD respondents largely expressed that this was an effective and fair way of dealing with conflict, except – unsurprisingly -- for individuals

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[24] No GD included herders/pastoralists, even though this was requested by the study team.

present at the GDs who had not been able to continue with the CCRO process due to their inability to resolve personal land conflicts.

Although none of the approaches appeared to have dedicated conflict resolution staff or support, they did have differing approaches for conflict prevention to minimize the amount of conflict that occurred. For example, some projects required both the land user and the neighbors to be present during the mapping process, to ensure agreement on the boundaries before the mapping even occurred. This approach was reported as an effective way to avoid conflict, as well as to resolve it quickly if it occurred.

There are also apparent tradeoffs around conflict avoidance or mitigation steps, and efficient parcel mapping, which may be unsurprising given that both are time-consuming (and personnel-intensive) processes. Some of the comparison projects, in an effort to conduct timely and efficient parcel mapping, asked villagers to mark their parcel boundaries prior to the arrival of the surveyors, and then used district land surveyors to map the parcels. At times this was done without any of the land owners or neighbors present. The verification process then served as the forum for land users and neighbors toagree on the boundaries. The GDs suggested that this approach was less effective than the MAST approach, ultimately leading to a more protracted verification period and delays in CCRO processing due to conflicts.

In contrast, the MAST approach required boundary agreement at the time of mapping, and for neighbors to be present, thus minimizing the subsequent verification time and effort. This approach also appeared to allow for additional discussion, learning, and conflict resolution by having a "mediator" (e.g., community leaders and the trusted intermediaries) be present to help resolve any disputes. This is in contrast to mapping by district land surveyors, who – while certainly technical experts – may be less well trained or incentivized to mediate villager disputes over boundaries. GD respondents gave the impression that DLO approaches to dispute resolution within villages often strongly place the burden for resolution on the disputing parties themselves.

The post-mapping verification process also varied across the approaches. However, most projects held public meetings for the villagers to verify the information. One comparison project did this individually rather than via public process, by requesting villagers to come to the village office to review their forms. Based on the village GDs and KIIs, the verification process was an important marker of the overall perceived success and trust in the CCRO process for respondents, and a clear indication of their perception of the quality of the process. For example, when the forms came back and required a lot of corrections, land users who had been confident in the process at the beginning lost some faith in the project's accuracy as well as the capacity of the DLO. This was particularly true for projects that required multiple verification sessions before the CCROs were correct.

Most of the communities reported a strong understanding of the overall process and purpose. However, projects had great variation in terms of villagers' understanding of the benefits and importance of the CCROs. In general across the projects, the understanding the benefits of having a CCRO or how to use those benefits was lacking. GD participants often referred to the benefit of being able to use it for obtaining a loan. However, no participant mentioned using it for this and it is unknown whether this is possible. Another benefit that one village GD (Lukenge, Mvomero District) mentioned was that it was keeping herders/pastoralist off their land. However, for this village that had not been the case, since 2.5 years after being mapped this village is still dealing with conflicts between land users and the herders/pastoralist in the community. GD participants in that village expressed their disappointment of the CCRO not being able to protect their land.

Lastly, village-wide versus selective mapping of a fixed number of parcels (due to budget constraints) also appeared to contribute to overall perceptions of fairness of the approach among villagers. As noted earlier, the approach for four of the villages visited for this study mapped land parcels for all interested

villagers. However, due to budget restrictions, two of the comparison project villages mapped land and provided CCROs for a fixed number of parcels in the village, or ran out of funds before the process could be completed for all villagers who wanted to have land mapped. In both circumstances, unmapped land users who participated in the GDs wanted the project to return to complete the mapping, and it was apparent that there was some sense of unfairness among the community that not all villagers were able to get a plot or all of their plots mapped.

Quality of the Data Collection and Transmission Platform in Terms of Accuracy, Functionality, Ease of Use, and Accessibility

Overall, the qualitative data suggested some clear efficiencies and quality benefits to the MAST approach in terms of: (1) ease of use and time to achieve fluency/capacity to use the system by the technicians conducting the parcel mapping (including by trusted intermediaries rather than district surveyors); (2) error avoidance and integrated collection of land boundary and land user information and systematic transmission to an integrated electronic database that automatically links parcel boundary and user information together into a central database with built-in backup and storage (which avoids requiring land office staff to do this manually, or having to create their own electronic backup database); and (3) conformance of information collected to GoT standards for CCROs. District staff and villagers also indicated that it is less technical to learn and use the MAST smartphone application to map land and record user rights information relative to the GPS+GIS system. However, while one of MAST's intended benefits was to include wider transparency and accessibility of land user information to individual villagers via internet accessibility, GD respondents did not indicate this to currently be of strong interest or relevance to MAST CCRO beneficiaries.

Nevertheless, there appear to be some clear advantages of the MAST approach over the typical approaches to land formalization documentation adopted by the comparison projects, with benefits to overall quality of the results, time to complete the CCRO process, and the overall trust of beneficiaries in the process. The integrated entry of the land user's information during the physical process of mapping their parcel boundaries, and the automatic creation of an integrated database of the parcel boundaries linked to individual user information via the MAST system, appears to have clear efficiencies and benefits in terms of fewer data entry errors associated with the land user information. DLO staff in the KIIs mentioned erroneous land use information as a common source of errors and inefficiencies during CCRO preparation, necessitating additional staff time to correct erroneous information.

For the MAST approach, efficiencies and contributions to greater accuracy of the information listed on the CCRO document (distinct from the accuracy of the parcel boundaries and mapping) appeared to stem from at least two elements of that approach that differ from the process and technology used by all of the comparison projects. First, the land user is present for the data entry process, as it occurs during the parcel boundary mapping, and can verify the information directly as it is entered into the MAST application by the trusted intermediary. This reduces the potential for errors in the land user's information, spelling errors, or incomplete information (this is also reduced by checks in the MAST system that will not allow data entry to proceed if key elements have not been entered). Second, the MAST system automatically links a particular parcel map with a given land user individual, their photograph, and other document information, in an integrated database at the time of the parcel mapping.

In contrast, other systems require DLO staff to manually link data in the GIS to the supporting information about individual users, their beneficiaries, and boundary neighbors, and to later attach their photographs to the paper documents. This provides many opportunities for errors, which can result in CCRO documents that include the wrong names, pictures, or parcel boundaries. Data collected for the comparison projects indicated that such errors are common, and can result in long delays or

inefficiencies in CCRO production. In one district that the field team visited, land officers estimated that such data entry and linkage errors resulted in up to 30 percent of CCROs containing errors that required subsequent corrections to documents. In another district, the extent of incorrect information on CCROs (including names and pictures incorrectly paired with parcel maps belonging to other individuals) was so problematic that three rounds of CCRO verification with villagers were required before the information was correctly sorted onto the CCROs. Villagers estimated that each additional verification round took three to four months, thus adding an additional six to eight months' time to the total process in that instance.

Unsurprisingly, this also shook villagers' confidence in the process and their trust in the accuracy of the information held in the district land information system. The below discussion from the village where three rounds of CCRO verification were required, due to errors with villager information, provides a clear illustration of the how the contributions to error avoidance from the integrated MAST system provided a benefit for the overall quality and sustainability of the land formalization effort.

> *Facilitator:* [The way I have understood, villagers were not confident with the accuracy of information and verification processes]
> *Man #1*: [For now, or during the process?]
> *Facilitator:* [On whatever occasion]
> *Woman #1*: [During that time, villagers were confident and very happy with the verification process, but now, even if you play drums, no one will allow his/her plot to be surveyed]
> *Facilitator:* [During the verification process, were there complaints that villagers found their information inaccurate?]
> *Man #2*: [Yes, as said by the previous speaker, you might find your face in someone else's plot]
> *Facilitator:* [But why did you say that you trusted the information collected during the verification process?]
> *Man #3:* [Yes, we trusted that at the initial survey process, but during the verification, they came twice or thrice asking the same information. For example, for the first time, they ask about the ownership of your picture, is it you? Who is your neighbour in the south? You verify, and agree that everything is fine. Next day when they came, you do not see yourself, the picture is replaced, or you find your face being put into another person's plot, also your picture might be with someone's wife instead of your wife and your wife is with another person or it's your face but a different name]
> *Facilitator #2 - DLO:* [I would like to ask an additional question to that. Were you not confident because the mapping and verification process did not finish or you were not confident about the whole verification process?]
> *Man #4*: [As said, we trusted the initial survey process, but when we saw the inconsistency in verification process, then the ultimate confidence in the process was very hard to see]
> Source: Nyamwege Village GD, Rufiji District, December 13, 2016.

Feedback from district staff who participated in a brief MAST demonstration during the qualitative data collection also supported the above, noting benefits to the more integrated and participatory process of the MAST approach that could enable village-wide parcel mapping to be completed in less time and at lower cost. These staff also noted that the district staff per diem to conduct mapping in villages is a substantial component of the overall cost of the process. Thus, a process that requires less time for district staff to be in the field -- and with lower potential for data entry or linking errors – would likely be more cost-effective. However, district surveyors also raised some important questions that – while beyond the scope of this study – may need to be addressed for wider implementation of MAST, including: whether there were sufficient checks and balances on this more participatory system, for example to ensure that only authorized users were contributing information to it; and how the system would work if collecting information from multiple villages concurrently.

In terms of the accuracy of the MAST mapping system, MLHHSD staff indicated that it tested the accuracy of the phone GPS system against the handheld GPS typically used for survey work by GoT, and found no differences in the mapping accuracy. Iringa DLO staff also did not indicate any major issues

with the accuracy of the parcel mapping via the MAST system. From the perspective of villagers, village land committee members, and individual land users in villages, the qualitative fieldwork also suggested no major differences in the perceived accuracy of the parcel mapping via the MAST system and trusted intermediaries relative to the parcel mapping by district surveyors using handheld GPS.

For both technologies, villagers expressed high confidence that the boundary information and representation of their land parcels was accurate and reflected reality. Villagers also expressed no concerns over the security of their information as held in the land information system or by the district. It could be argued, however, that without any reference point or juxtaposition of their information with underlying base maps or the VLUP, villagers may have little ability to know if their parcel maps might conflict with other land designations. In this respect, the MAST villagers noted some added benefits of the MAST system, in which a satellite base map and the VLUP are displayed during the parcel mapping of individual plots, which contributed to their high confidence in the veracity of their parcel maps.

> *Facilitator: [If we look at this Mobile Technology to Secure Tenure. It might be the first time to be used in this village; do we trust it?]*
> *Man #1: [that for mapping?]*
> *Facilitator: [That for collection and dissemination of information, I will come back to explain more on that. First, answer my question did we all trust it?]*
> *Man #2: [First they showed us as a prototype to see is it really producing the CCRO? And we witnessed it is happening, then we trusted]*
> *Facilitator: [So, did you trust the technology before testing it?]*
> *Man #3: [No]*
> *Facilitator [So what do you say now, if we have another exercise to do mapping, do we go back to our old technology or you prefer this technology?]*
> *Man #4: [I think this technology is good, because it saves time, I remember those years we used rope to measure, which took too much of our time, in short this one simplifies work, you can use short time to finish the plot mapping]*
> *…*
> *Woman #3: [It is an appropriate technology because, before we were using rope to measure the plot size, but now we feel that this technology provides more accurate results as we know our neighbours this and or that side of the plot]*
> *Facilitator: [What about the information verification process? as that is only during mapping exercise, do you think this is the right technology]*
> *Man #6: [Yes, it took very short time to verify one's information, so it correct]*
> *Man #7: [I would say that is an accurate technology to use. Because, you might instruct the surveyor about your boundaries, ultimately when he connect all the coordinates, he will show you the actual shape of your plot. In addition, if the neighbour have already mapped their land, it shows the names of the neighbours located in each side of your plot. For instance, in the north, your neighbour is this, and when you verify, you find it true, in the west your neighbour is that, he read for you and when you verify it, you find it correct. So I can conclude by saying that this is the right technology to use]*
> Source: Itagutwa Village GD, Iringa District, December 2, 2016.

> *Facilitator [Do you think the MAST technology reflect the reality that you know?]*
> *Man #1: [Yes, the technology reflected the reality, for example if the technology (the MAST app) says that this place is a road or a reserve, you find it to be true. … The use of that Mobile technology was better because our plot areas are full of bushes (dense vegetation), and this technology - even moving through the bushes it still tells you that this is a corner according to the instructions given to the surveyor by the land owner.]*
> *Woman #1: [In my opinion, I think it reflected the reality. For example, this village is near to the boundary of another village, so if you try to map close to another village, then it shows that you are in another village]*
> Source: Kitayawa Village GD, Iringa District, December 3, 2016.

The study eam drew on the perspective of DLO staff to report on quality of the land information system with respect to functionality, ease of use, and conformance to GoT standards for issuing

CCROs. Iringa DLO staff noted that in general the MAST system provided several added benefits for ease of use and functionality over the traditional handheld GPS for mapping, coupled with entry into a GIS and manual entry and linking of the accompanying land user information. Some of the benefits noted include: the ability to remove or avoid overlapping parcel boundaries, and the ability to produce disaggregated statistics on customary land rights fairly easily (e.g., by gender or marital status). In other districts, land office staff who saw a MAST demonstration noted that the way the MAST system enables the information to go straight into an integrated electronic database appeared to be more efficient, and an improvement over the GPS+GIS system that they use. DLO staff also reported that the MAST system and accessing records within the system was easy to learn, with standard training provided. In other words, the training required was not seen as unreasonable or a necessitating a significant amount to become comfortable using the system.

However, respondents also noted that the MAST system is not without limitations and constraints that would need to be addressed for the system to be truly functional under more widespread implementation. This is to be expected, given the small scope of the initial pilot and emergent nature of the technology. Although a focus on these types of scaling issues was outside the scope of this study, respondents highlighted the following issues: server access difficulties and questions around ownership, inability to edit within the system without certain external permissions, limitations associated with completing land transfers and updating CCRO information, creation of a unique user identifier, and various other glitches in the system that emerged over the course of implementation of a larger follow-on project currently underway in the district. As is the case for any scaling initiative, it is to be expected that additional issues will emerge during broader scaling up that could require design modifications, as the system encounters additional possibilities or permutations from new cases, and also with the expansion of simultaneous data collection and transmission from multiple teams working across several villages or even districts.

Such issues – despite the challenges they present – are in contrast to the current and substantially less streamlined handheld GPS+GIS approach for parcel mapping, coupled with manual data entry and linkage of land user information system that is currently the standard in Tanzania for customary land use formalization efforts. While DLO staff generally reported ease of use working in their systems and making changes as needed, provided there are staff with the requisite GIS and GPS skills, this system has several steps that require manual data entry, and is neither directly established as an electronic database nor is it automatically integrated across the parcel mapping information and the land user's information. Thus, while MAST understandably has a distance to travel in terms of full functionality of the system for large-scale implementation (in comparison to the standard system that is currently used in Tanzania), there clearly are a number of benefits to data quality and functionality for facilitating accurate CCRO delivery that stem from the MAST approach.

As an illustrative counterpoint, the study team observed varying overall capacity and technology constraints across the small number of DLOs it visited. This ranged from DLOs that had lost their electronic database of CCRO information due to computer malfunctions, to those that were just embarking on the process of converting paper documentation to an electronic database, and linking parcel GIS maps with land users in an integrated electronic database several years after conducting the land mapping and land user information collection. This range of technical capacity is likely indicative of varying capacities across many districts in the country. For districts that did not yet have an electronic database, it was clear that even finding a particular CCRO file can be very difficult, for example if a land user or CCRO holder requests a modification to their document, or the district is asked by a bank representative to produce the district's CCRO for a particular individual as part of the bank's verification process for a loan application. Moreover, it is unduly time consuming and error prone to calculate any village- or district-wide statistics when all of the information is stored as paper files. As one

comparison project DLO staff member in Kilolo District commented, "Even to count the number of [CCRO] forms, for example, you are just doing it manually now."

On conformance to standards, feedback from the Iringa DLO and MLHHSD indicated that the MAST system clearly meets all standards required by GoT to issue a CCRO. This is bolstered by MLHHSD apparently having decided to require the MAST CCRO template to be used across all future land formalization projects in Tanzania. Some of the information documented and listed on the CCRO under the MAST template actually exceeds the information requirements for the document under GoT regulations, for example the marital status of the land owner. However, one MLHHSD liaison indicated that the Ministry found that including this additional information helped to meet project goals of emphasizing women's rights to land.

The qualitative data raised a number of interesting issues with respect to information accessibility for village land users, from the perspectives of DLO staff and village land users. In general, villagers tended to feel it was sufficient to be able to access a copy of their CCRO information at the village or district office, even though travel to the district office might be a constraint.

District- and village-level key informants, as well as villager GD participants, also commonly expressed that instances where a villager would want to access their information from the village office or the district are uncommon, because the villager already has all of the same information on their individual copy of the CCRO. Reasons why one might need to access the information from the district could include: if there are small errors on the document that the land user would like corrected; requesting a change to beneficiaries; or if the CCRO holder or a named beneficiary has died. Across the GDs, people were generally aware that there are three copies of their CCRO documentation: the individual copy they received (for those who had received a CCRO), a copy stored in the registry at the village office, and their centrally stored information at the DLO.

For nearly all of the village office KIIs, village *Mwenyekiti* indicated that although people know they can come to the village office to request their CCRO information, and the village office is prepared to help them with their needs, in their general experience this does not commonly happen. In all of the villages, GD participants indicated that they knew they could also see their information in the village office registry and notebook, but only some of the *mwenyekiti* said that anyone had ever come to their office to do this.

DLO interviewees expressed a similar view was expressed across all districts visited for this study, noting that it was very uncommon for villagers to ask for their CCRO information. The main barriers mentioned were that the fare to reach the district headquarters is too expensive, and also that generally they are accustomed to having to wait a long time to see someone in the district office who can help them with their request, or may not always get the assistance they seek. In one of the comparison projects, a small percentage of the Tsh. 3,000 fee collected by the district for each CCRO had been reserved as a transport fund, to cover the fare for villagers who need to visit the DLO for CCRO-related requests, although it did not appear that this had been used frequently.

In light of the above, one of the potential benefits of the MAST system that has been highlighted by USAID is the opportunity for village land users to access their land information directly via the internet, with potential benefits for transparency. However, the study team found that this potential benefit does not currently appear to be very important to village land users. The overall sentiment from MAST village GD respondents was that it is much easier for them to access their records via a visit to the village office or the district, or by asking their village leaders to follow-up on an issue on their behalf. All of these routes are familiar to them, and despite drawbacks around transport fares and the time it can take to deal with district bureaucratic processes, this is how they are typically accustomed to and comfortable with addressing information needs that might arise with respect to their land rights or

CCROs. GD responses reflected that the current level of familiarity with smartphones and the internet is generally quite low in rural Tanzania. Thus, the ability to access land records via a smartphone app appeared not to be relevant to GD participants.

> **Facilitator:** [After the process has been completed, do you think there could be a need to access your land information?]
> **Collective response:** [Yes]
> **Man #1:** [… I see the importance as if the information comes differently in the actual CCRO, that's where there could be a need for follow up and access of information]
> **Facilitator:** [any other benefit? Or you did not get education on this?]
> **Collective response:** [Mhhh..we do not remember]
> **Facilitator:** [Another question, do you know where this information is stored?]
> **Collective response:** [Village office]
> **Facilitator:** [Any other response?]
> **Man #2:** [They said that there are three ways, one CCRO remains with you, one in the village office and the other remains at the DLO]
> **Facilitator:** [What about the form of storage, was it in the files or internet?]
> **Man #3:** [Here at the village, we were told there will be village registry]
> **Man #4:** [the other storage way is in the air, so if there will be any disputes, that phone would have been used to access the information and solve the dispute]
> **…**
> **Man #6:** [They told us that, even if it happens that the CCRO information gets lost here in the village, or the district office is under fire, don't think that the information is lost - the information still is in the air (villagers reference to the internet / cloud system)]
> **Facilitator:** [Do you think it is easy to get or to learn how to access those information, in the air?]
> **Collective response:** [No, very difficult]
> **Woman #1:** [It is until you go to the district, you mention the year of CCRO issue, then they will search for your information (records)]
> **Facilitator:** [Did they show you any other way to access those information?]
> **Woman #2:** [Land office]
> **Facilitator:** [In this village, do we have people with smart phone?]
> **Woman #3:** [Many of them]
> **Facilitator:** [did they have an instruction on how to access land information using their phone?]
> **Surveyor:** [No…the mobile smart phones we used that had a MAST App..were special only for the MAST activity (explains they were told that most of the phones the villagers use are not sufficient to run the MAST app)]
> **Facilitator:** [Are you worried about the villagers' capacity to access land information?]
> **Man #7:** [We have no worry, because the CCRO information is stored as follows: one copy with me, one at the village office, one at the district and other one in the air]
> **Facilitator:** [I asked a woman a while ago and she told me that, if you need information, you need to go to the district, what is your say on that?]
> **Woman #2:** [It is a difficult, as I might not have money for fare to reach out to the district]
> **Woman #3:** [The other difficulty is even in the level of awareness itself, we did not know if information are also stored elsewhere, others only know that the CCRO information are only here in the village office, they don't even know about the district or in the air]
> **Woman #3:** [Really; It is true, even myself did not know that I could use the air to get my land information]
> Source: Kitayawa Village GD, Iringa District, December 3, 2016.

Requirements for Implementation in Terms of Time and Personnel

In general, the study team found the time and personnel requirements for the MAST approach to be feasible and in some aspects more conducive to facilitating a high-quality land mapping and CCRO delivery process. The approach also appears to enable more villagers who would like to have their land mapped (and obtain a CCRO) to do so. One of the key findings for the overall time to measure plots was that there was very little difference between the technologies (e.g., handheld GPS+GIS versus the

MAST smartphone application). Project respondents (i.e., DLO staff, villagers, and community leaders) all reported a similar range of times for mapping small and large plots, irrespective of the technology used. The main time factor for mapping different plots was the actual characteristics of the land and not the technology. Obviously larger plots took more time, but also the location of the plot and vegetation were factors. Land that was located on a slope or mountain would also take more time as well as plots that had dense vegetation or were not cleared.

Another key time consideration during the CCRO preparation process was the implementation time saved between having all the information entered during the mapping in a mobile app that they were able to later upload (MAST) versus information being taken manually by handheld GPS+GIS and then manually entered into a database. Although the study team was not able to estimate the exact time savings that result from this, DLO interviewees agreed that it was a clearly a more efficient process and less prone to errors. For Iringa, the only district that has used the MAST technology, the DLO expressed it being a positive change from using the GPS technology. During interviews with DLOs outside of Iringa, there was great interest in the MAST technology and being able to adopt it to ease the mapping.

The time and potential cost efficiencies for the MAST approach also likely resulted from the personnel requirements and team structure for parcel mapping under the pilot. Specifically, the use of the trusted intermediaries for the mapping, rather than more expensive district surveyor staff. The MAST approach was unique in drawing on villagers to implement the technical aspects of parcel mapping work. In other cases, villager participation ranged from being present during mapping, to supplying members of the Village Land Use Management Committee to accompany the district survey team. However, when villagers were asked during the GDs if they thought they had the ability to conduct parcel mapping, most responded that with training they would be able to do so. Still, while there is some precedent for training villagers on GPS and geospatial data collection in Tanzania and elsewhere, there is little doubt that GPS technology is clearly more technical and time consuming to learn than that of the mapping via the MAST app.

An additional potential benefit to using trusted intermediaries to conduct the mapping is that, because they are already located in the villages and do not entail additional per diem expenses that district staff do, it is possible to conduct parcel mapping over a longer time period, if needed. This flexibility may be important from a quality and completion standpoint, where village-wide mapping in the aim. The MAST approach had a longer window for parcel mapping than the other approaches, which generally used a fixed 3- or 10-day window for parcel survey and mapping in a given hamlet or village. GD respondents across all of the comparison projects expressed dissatisfaction at this, and noted it was a key reason when many households could not have their land mapped.

> *Man #1:* [there was another thing happened, other villagers were given three days as a deadline. If you miss that, there's no chance to map your land. This discouraged most people, and because of this we have other villagers who couldn't map their land]
> *Facilitator:* [so did you say the time was only 3 days for mapping only, or the whole process?]
> *Man #1:* [For example if you are given ten days, once those days are over, no additional days were granted. There were other villagers who couldn't map their land because of this and now they don't know when and how to map their plots]
> Source: Melela Village GD, Mvomero District, December 8, 2016.
>
> *Facilitator:* [Let ask you one question, why some other people did not get their land measured?]
> *Woman #1:* [Time was too short]
> *Facilitator:* [Does somebody give any different reason? The committee members, why do you think so?]
> *Land use Committee member #1:* [Other people thought that the government want to take away their land]
> *Facilitator* [What sort of criteria did you use to select the eligible person's land for measuring?]

Land use Committee member #2: [we did not have any criteria … all who wanted their land got measured]
Woman #1: [But there were others like me who could not get my land measured, because whenever we wanted to measure my land, their time was off for the day, then next day the same happens. It happened for the three days without any luck.
Source: Lyamko Village GD, Kilolo District, December 4, 2016.

Facilitator: [What about the whole time used in the mapping and verification process, let us say ten days, was it enough?]
Woman #2: [the time was limited as there were others' land could not get measured because the time was not enough]
Woman #3: [The time was not enough because in our sub village, the exercise took like only three days to complete. Due to the population of people who needed to map their plot, three days is not enough. They said that if you do not belong to the sub village who receive the mapping service in that day, you could not get your land measured.
Woman #4: [Most people followed up to one week, but could not get their land measured]
Facilitator: [So, the time was not enough?]
Man #2: [Yes, time was not enough as mentioned by the women, for instance in Lyamko Village, most plots are far away from the owners …]
Man #3: [The other reason of not succeeding in this, is having scattered plots, sometimes plots are located in places where you need to use a vehicle to get there]
Woman: 5 [Others were there during the process but did not receive the mapping services]
Source: Lyamko Village GD, Kilolo District, December 4, 2016.

Facilitator: [What sort of skills were required for the village member to participate directly in this (mapping) process?]
Man #1: [You must know how to use the smart phone]
Facilitator [if I were to come back in this village doing the same MAST activity, do you think it is easy to get the skilled personnel.]
Collective response: [Yes, so many]
Source: Itagutwa Village GD, Iringa District, December 2, 2016.

Drawing on villagers to conduct the mapping can also be beneficial, given that DLO KIIs indicated fairly wide variation in DLO staff availability and capacity across districts. For example, in one district, even staffing a team of three surveyors to conduct mapping for 10 villages strained the district's resources. To meet project needs, the district office borrowed surveyors from other DLOs, and also relied on university students trained in GIS to help fill personnel gaps. Other districts had a sufficient number of staff trained in GPS and GIS, but district staff per diem was a costly element of land formalization efforts. Thus, projects were constrained in how much time they could spend in villages. In contrast, the MAST approach was able to draw on villagers for much of the technical surveying and mapping work, and the villagers were also able to serve as broader day-to-day sources of knowledge on project processes and aims. One apparent result of personnel constraints is that all steps in the process are kept to a short and fixed number of days. However, qualitative data collected for this study suggest that such constraints can have clear negative implications for overall quality of the effort, with likely effects on project objectives around increased tenure security, land investment, and household economic wellbeing.

Facilitator: [After the land mapping and verification completes, were there villagers who tried to access their information due to various reasons like transfer of ownership, wants to take loan etc?]
Man #1: [No, but they told us once we have CCRO, Banks are open for loans. However, since they left, now one has tried to access the information]
Facilitator: [Why there is no such culture of requesting land use information? Don't you have any use needs for these information?]

> *Man #3:* [We have needs, but we did not have clear guidance on how we can access these information, we didn't know where to get, also we don't know even the value and use of these information, don't know how the transfer of ownership happens, if I want to sell, I don't know the procedures]
> *Facilitator:* [Do you think it is true about what our colleague says?]
> *Collective response:* [Yes]
> *Man #5:* [We missed that education and awareness]
> *Woman #1:* [The main issue here is that awareness, yes we have CCRO, but to know that CCRO could be of big help in case of problems, that awareness is still in our minds]
> *Woman #3:* [I think it is like students in the classroom, others might not get what the teacher said, may be we only understood the mapping process, but to understand the how this CCRO is more beneficial to me, I think we missed that.
> *Facilitator:* [Do we have a different opinion? The committee members are 100% confident that villager are not aware.]
> *Land use committee member:* [Yes]
> *Facilitator:* [Do you know where that information are being stored?]
> *Widow:* [We do not know, like myself a widow, I just received it as a piece of paper]
> Source: Lyamko Village GD, Kilolo District, December 4, 2016.

Lastly, perhaps one of the most salient time factors that emerged during the qualitative data collection was the overall time it took for communities to receive their CCROs, although the reasons for this appear to be primarily outside the scope of this study. Still, the overall time to CCRO receipt was one of the largest complaints across several of the GDs. In several villages visited for this study, only a portion of expected CCRO documents had been delivered to the village, and in others the documents had not been received at all. The two predominant reasons for such delays appeared to stem from villages having experienced delays in raising funds and preparing the necessary locked storage they are required to have for the CCROs, per GoT regulations; and DLOs struggling to find funds to purchase the required official folder for the CCRO document that is required under GoT regulations (when project funds had not been allocated for this).

> *Man #1*: [I do not even have the CCRO. If I would have received CCRO, I would have gone to banks or the courts to get money to help pay school fees for my children. However, this is not the case, we are just using unsecured land, and for instance, now, we have many villagers with five acres each who did not map their land]
> Source: Nyamwege Village GD, Rufiji District, December 13, 2016.

CONCLUSIONS

Overall, the quantitative cost-per-parcel analyses suggested fairly wide variation in the estimated cost per CCRO prepared across the different projects and districts. Some of this variation likely related to missing cost information from some of the cases, or economies of scale that could be realized from implementation in multiple districts, even when the number of villages per district was small. The estimated cost per CCRO prepared of the MAST approach, as implemented in the last two pilot villages, appears to be on the higher end of the comparison cases examined for this study. Project and village context factors likely affect these results, including the nature and implementation structure of the MAST pilot relative to the more district-embedded comparison approaches, and factors such as differences in village topography and extent of protracted land disputes, that are likely to be particularly influential when the overall scope of projects are small.

Cost and Quality Trade-offs

There is some evidence of a trade-off between per-unit cost and quality. While the estimated cost of the MAST approach fell on the higher end of the comparisons, the approach also appears to have provided CCROs to village land users substantially more quickly. There also appear to be some clear advantages of the MAST system over the typical approaches to land formalization documentation adopted by the comparison projects, with benefits to overall quality of the results, time to complete the CCRO process, and the overall trust of beneficiaries in the process. The MAST approach scored higher on key quality criteria, with potential efficiency benefits, and villagers more knowledgeable and trusting in the land formalization process.

Although all of the comparison projects appeared to experience challenges in completing the culminating step from CCRO preparation to actual delivery of the document to target beneficiaries, the MAST process appears to have navigated this process fairly successfully (it was certainly the most successful across the comparison cases examined for the qualitative component of the study). This is important, as delivery of the CCRO documents to individual villagers is a key objective of any land formalization process, and a crucial element of the overall theory of change for improved household tenure security and economic wellbeing through customary land formalization programs.

This study also examined key patterns in resource allocation across the comparison cases, which could relate to the overall quality and sustainability of CCRO service delivery. Although some of the observed differences stem from different ways that projects aggregated costs, the proportion of resources devoted to training and workshops appears to have been higher for the MAST approach (and one of the comparison approaches). This was linked to overall quality, suggesting that the depth and content of sensitization efforts, and the time window provided for parcel mapping in a village, had positive implications for villager knowledge and trust in the process and ability for potential beneficiaries to have their land mapped. Given that the MAST approach appears to have directed a greater relative portion of its resources towards village-level training and workshops than several of the comparison projects, it may also suggest that such resource allocation is important. In addition, all comparison cases allocated a fairly large proportion of resources to personnel, which may simply be a reality of customary land formalization efforts, or offer scope for additional efficiencies by future efforts.

Key Considerations and Learning

While cost is a crucial consideration to inform scaling up, the qualitative component of this study provided an important opportunity to examine differences in equally important non-cost dimensions, such as transparency and inclusiveness of the mapping and verification process, quality and accessibility of the land information compiled, and overall time and personnel resources required. Although the cost-per-parcel analysis suggested that some of the comparison approaches may be more parsimonious to achieve CCRO delivery than the MAST approach, it is not clear that the quality of service provided under such less costly approaches is as well situated to effectively meet the broader objectives of customary land formation efforts, such as reduced land conflicts, and improved tenure security, land investment, and overall household economic wellbeing.

Thus, the higher relative cost of the MAST approach appeared to have positive links to overall quality and potential longer-term sustainability of anticipated outcomes. This somewhat higher cost may also have knock-on effects for higher quality and overall project sustainability to meet intended household social and economic objectives beyond CCRO provisioning itself. Overall, this may point to some inherent tradeoffs between cost and quality for small-scale land formalization efforts. Still, villagers

across the comparison cases expressed a lack of certainty as to how the CCRO would ultimately help them obtain some of the benefits purported by projects, including access to loans.

Contributions to Approaches to Cost-Accounting of Per-Parcel land Formalization Efforts and Overall Effectiveness

Although many sectors increasingly highlight the need for CEAs of development interventions, there is currently no standard CEA methodology in the land sector, and a lack of comparable existing work in this area. The methods used for this study were based on work done in the health and education sectors, which have a more extensive history of CEA for development interventions and good agreement on the elements of a standard approach. Given the lack of precedent for detailed analyses of per-parcel-costs and associated quality of customary land formalization efforts, the study team aimed to describe the cost comparisons as systematically as possible, and also note the challenges encountered with the adopted approach. Keeping such limitations in mind, this analysis aimed to state assumptions that were made and key sources of uncertainty, and to focus on estimated cost ranges rather than point estimates. This initial exploration of a cost-effectiveness accounting, together with quality considerations, may also serve as useful entry point for future efforts to draw on or improve.

The exploratory nature of this work highlighted some key challenges and uncertainties in trying to systematically compare per-parcel costs of land formalization efforts across comparison cases. This initial effort may serve as a useful entry point for additional efforts to understand per-parcel costs of customary land formalization projects, consider how such costs may relate to overall quality and sustainability of the effort, and facilitate informed decisions on intervention options. To improve on the accuracy of cost estimates, future efforts may benefit from tracking costs during project implementation with this explicit goal in mind. Accuracy may also be improved by tracking effort and staff days across each of the steps in service delivery more explicitly, which could also help to identify where greater efficiencies to time and personnel costs might be gained. This would also include, for example, considerations of volunteer or unpaid personnel or labor contributions to activities, including that of villagers who may not always be paid allowances for their inputs, and accounting for materials and equipment used by the project that were not directly paid for with project funds.

To enable assessment of the cost effectiveness of different potential land formalization approaches against the longer-term outcomes that such interventions aim to promote, future work could also consider drawing on effectiveness measures obtained from rigorous surveys of beneficiaries on longer-term outcomes that are anticipated to result from CCRO provisioning, such as measures of tenure security, conflict incidence, land rental, or investment within villages. However, to do so would require more extensive data collection than was possible for this study, as well as sufficient time for such potential outcomes to accrue. Understanding costs per unit CCRO and their links to quality and overall likely achievement of longer-term project goals makes an important and informative contribution. In addition, such longer-term analyses can also ultimately enable evidence-based decisions on development programming such that decision-makers are able to select intervention alternatives that are both cost-effective and likely to attain quality goals.

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ANNEX A: STUDY STATEMENT OF WORK

Performance Evaluation of Mobile Application to Secure Tenure (MAST) Pilots

1. Activity Description

The Mobile Application to Secure Tenure (MAST) project seeks to test the concept of a participatory or "crowdsourced approach" to capturing land rights information using mobile technology to efficiently and affordably create an inventory of land rights. USAID selected Tanzania as the country in which it will carry out the first two pilot tests to "ground-truth" the technology, information transfer, and community education/advocacy components of the project's approach. The MAST pilots fit into USAID's strategic reform agenda pertaining to the use of science and technology to resolve development problems.

USAID/E3's Office of Land Tenure and Resource Management funds and oversees the MAST project through its Evaluation, Research, and Communication (ERC) Task Order under the Strengthening Tenure and Resource Rights (STARR) Indefinite Quantity Contract (IQC), and the implementing partner for the pilots in Tanzania is the Cloudburst Consulting Group. Information on activities and outputs related to the execution of the MAST project will be provided to USAID/Tanzania with the objective of supporting other Mission strategies that may be focused on promoting transparency in government and enhancing the country's investment climate for agricultural development.

The MAST project will develop and implement a new methodology using mobile phone technology to facilitate the process of land registration and administration. The initial pilot will be undertaken in the village of Ilalasimba, with implementation beginning in January 2015. A subsequent pilot is planned for Tanzania in a site still yet to be determined to begin around mid-2015.

The initial MAST pilot will develop a technological platform to record Geographic Information Systems (GIS) coordinates and other land-related information. Local enumerators will be trained to gather data from individuals/households that occupy plots of land and from those living on adjacent plots who can validate occupant boundary descriptions. These multi-party boundary descriptions linked to GIS coordinates will be visualized as maps and transmitted along with interview data on boundaries (on which those who contributed data may or may not agree) to local land authorities in villages that are certified, in accordance with the Tanzanian Village Land Act (1999), to maintain land registries. The information will be stored in a cloud-based storage facility that will allow it to be exported to standard application forms and documents, which will then be used to issue Certificates of Customary Right of Occupancy (CCROs) to landholders in the project area. Ilalasimba was selected for the first MAST pilot site in part because it is "implementation ready" as a village certified to establish land registries and issue CCROs.

The MAST project also anticipates community organization and education components to educate village residents about the project's land mapping service and how those maps can be used to obtain CCROs, and build a deeper understanding of priority issues related to land titling including their role in making investments and land transfers. These components include technical assistance interventions, training and capacity building for use of mobile technology in mapping, as well as a range of communication, advocacy and managerial activities.

2. Development Hypothesis

Figure 1 illustrates USAID's development hypotheses for the MAST pilots, highlighting each of the intended results of the pilot and the presumed causal linkages (arrows). The project is predicated on the establishment of more secure land tenure as the direct outcome of the pilots as well as on investments made once land security improves. Conflict, where it exists, may impede investment, but the theory of change allows for the possibility that changes in investment may occur as the result of documented property rights where conflict is not an issue.

FIGURE 1: MAST PROJECT THEORY OF CHANGE
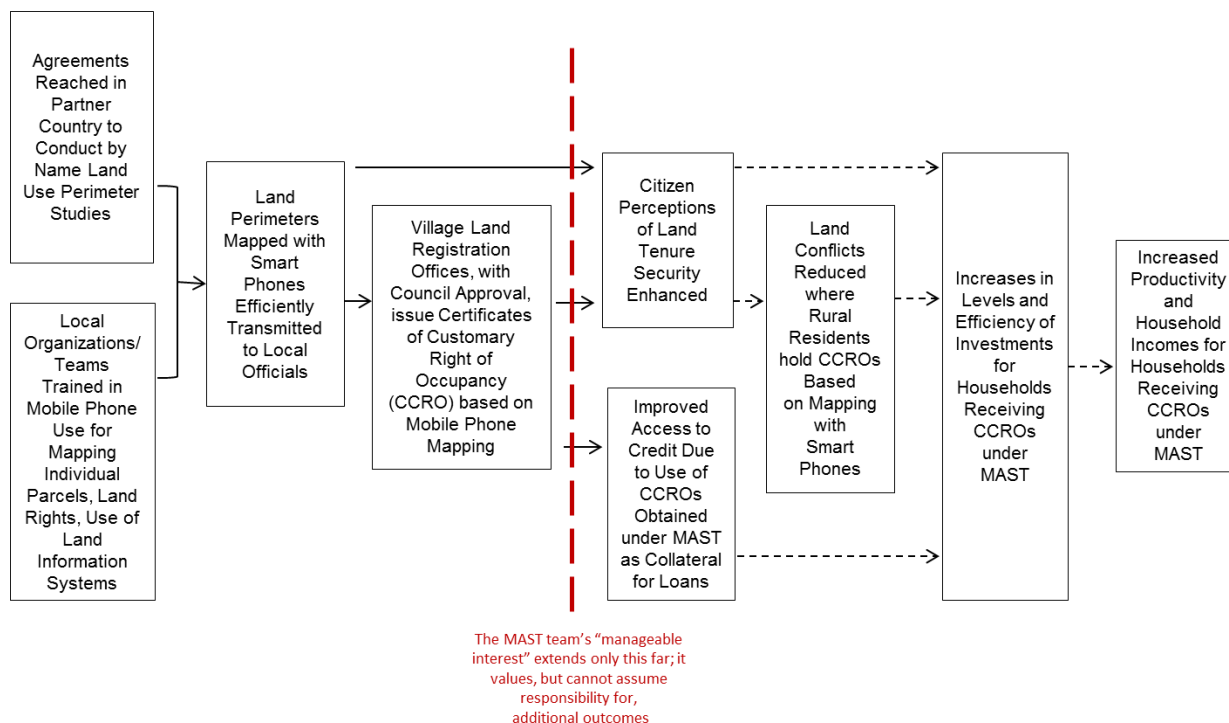
3. Existing Performance Information Sources

As this will be a new project, there is no existing information on its performance.

4. Evaluation Purpose, Audience, and Intended Use

The evaluation tasks described in this document will provide USAID and its implementing partner with practical information on the MAST model for drawing lessons and refining the implementation approach for future MAST pilots. An important goal of the evaluation tasks described is to assess the possibility and desirability of scaling the MAST technology, which could be supported by the GoT, USAID, or other donors.

The immediate audience for the performance evaluation to be conducted for the first MAST pilot will be the Land Tenure team in E3/LU and the Cloudburst Group. USAID/Tanzania is also a key audience for the performance evaluation, as this study will address questions that are relevant for the Mission should it elect to further replicate the pilots that will be undertaken or support efforts by the Government of Tanzania to do so. Given its interest in land tenure issues, USAID/Tanzania's Feed the Future program is also a potential user of the performance evaluation's findings. These audiences are also expected to benefit from information on the cost and time effectiveness of the MAST approach relative to past and

ongoing alternatives in Tanzania for mapping property boundaries and securing land tenure under the country's procedures for issuing CCROs.

Beyond USAID, key audiences in Tanzania include the Ministry of Land, Housing, and Urban Settlements (MLHUS), which has already indicated an interest in using the mobile technology being developed to capture and transmit information on land parcel boundaries. Other donors working on land tenure issues in Tanzania are an additional audience for the performance evaluation's results. In particular, a major land registration project funded by the United Kingdom's Department for International Development (DfID) and the Swedish International Development Cooperation Agency (SIDA) is currently in the planning stages, and the evaluation team has had preliminary discussions with program staff that indicate a high level of interest in the results of the MAST evaluations.

5. Evaluation Questions

The performance evaluation of the first MAST pilot site will consider the following overall question and related sub-questions:

1. How did beneficiaries and other stakeholders in the first pilot site perceive MAST?

    a. Was the mapping and verification process seen as transparent and participatory?

    b. What disputes arose in the course of mapping and verification, and were these disputes resolved fairly?

    c. Were the data collected by MAST sufficient to allow for the issuance of CCROs?

    d. Did MAST outreach and communications activities inform and educate users of land in the MAST village on the appropriate land laws and related processes?

The cost and time effectiveness special study for the second MAST pilot site will examine the following overall question and related sub-questions:

2. Is the MAST methodology as implemented in the second and third pilot sites a cost-effective, time-efficient, and appropriate approach to registering land in Tanzania relative to previous or alternative ongoing approaches?

    a. How does the cost-per-parcel of carrying out mapping, verification, and transmission of the information needed to issue CCROs using the MAST methodology compare to alternative approaches?

    b. Are there differences between the MAST methodology and alternative approaches in terms of:

        i. Transparency and inclusiveness of the mapping and verification process?

        ii. Quality of the data collection and transmission platform in terms of accuracy, functionality, ease of use, and accessibility?

        iii. Requirements for implementation in terms of time and personnel?

6. Gender Considerations

In line with USAID's Gender Policy, the research design for this evaluation will consider gender-specific and differential effects of the MAST project. Data collection and analysis approaches to addressing the evaluation questions will devote particular attention to identifying differences in the ways that men and women perceived transparency and inclusiveness of the mapping and verification process, experienced or perceived disputes, and interacted with the MAST outreach and communications campaign.

7. Evaluation Methods

In its Evaluation Design Proposal, the evaluation team will propose detailed evaluation methods suitable for addressing the evaluation questions. It is anticipated that a mixed-methods approach will likely be appropriate, largely utilizing qualitative data collection in addition to review of existing project documents and monitoring data and reports.

Data Analysis Methods

Data analysis methods to be proposed in the evaluation team's Evaluation Design Proposal will follow closely from the methods used to collect each type of data needed to answer the evaluation questions. Whatever data analysis methods are chosen for this evaluation, they should be justified in terms of their fit with the data collected for a question and the types of answers that USAID seeks. Time and cost considerations are also important in this area.

8. Strengths and Limitations

The evaluation team's Design Proposal should detail any anticipated limitations and risks to the implementation of the evaluation. In particular, the extent to which findings may be generalizable and risks to data collection should be considered as well as any other potential limitations.

9. Evaluation Deliverables

The evaluation team will be responsible for the following deliverables. Specific due dates will be proposed in the Evaluation Design Proposal to be prepared by the evaluation team.

Deliverable	Estimated Due Date
1. Evaluation Design Proposal, including description of the evaluation methodology, drafts of data collection instruments and a sampling plan, as relevant	o/a March 2015
2. Draft Performance Evaluation Report for First MAST Pilot	To be proposed in the Evaluation Design Proposal
3. Oral Presentation of Performance Evaluation Report for First MAST Pilot	To be proposed in the Evaluation Design Proposal
4. Final Performance Evaluation Report for First MAST Pilot	To be proposed in the Evaluation Design Proposal
5. Memorandum on Comparison Sites and Cost per Parcel Methodology for Cost Effectiveness Study	To be proposed in the Evaluation Design Proposal
6. Draft Cost Effectiveness Study Report	To be proposed in the Evaluation Design Proposal
7. Oral Presentation of Draft Cost Effectiveness Special Study Report	To be proposed in the Evaluation Design Proposal

All documents and reports will be provided electronically to USAID no later than the dates indicated in the approved Evaluation Design Proposal. All qualitative and quantitative data will be provided in electronic format to USAID either by email or by thumb drive, depending on the size of the files being provided. All debriefs will include a formal presentation with slides delivered both electronically and in hard copy for all attendees.

Prior to the submission of the Evaluation Design Proposal, the evaluation team will discuss with USAID whether its preliminary dissemination plan for this evaluation indicates other deliverables that should be prepared, such as translation of evaluation materials into other languages and additional presentations or workshops. Such additions as agreed with USAID will then be included in the Evaluation Design Proposal.

10. Team Composition

The evaluation will be delivered by a core evaluation team supported by technical and administrative U.S.-based evaluation and project management specialists. The core evaluation team should include a Team Leader with extensive evaluation expertise as well as additional researchers and/or subject matter experts, as appropriate. Tanzanian team members should also be considered for key roles on the team.

11. USAID Participation

Regular communication between the evaluation team and the designated USAID Activity Manager for this evaluation will be essential to the successful execution of the evaluation activities. The evaluation team will keep USAID apprised of changes and developments that necessitate/require any significant decision-making or modification of the approved Evaluation Design Proposal.

Possible USAID participation in the data collection phase of the evaluation will be determined prior to the start of field work.

12. Scheduling and Logistics

The evaluation tasks described in this SOW are expected to be completed from around March 2015 to June 2016. A Gantt chart will be prepared as part of the Evaluation Design Proposal laying out a schedule for the main evaluation deliverables anticipated over this timeframe.

13. Reporting Requirements

The format of the evaluation report should follow USAID guidelines set forth in the USAID Evaluation Report Template (http://usaidlearninglab.org/library/evaluation-report-template) and the How-To Note on Preparing Evaluation Reports (http://usaidlearninglab.org/library/how-note-preparing-evaluation-reports).

The final version of the evaluation report will be submitted to USAID and should not exceed 30 pages, excluding references and annexes.

All members of the evaluation team will be provided with USAID's mandatory statement of the evaluation standards they are expected to meet, shown in the following text box below, along with USAID's conflict of interest statement that they will sign and return to the E3 Analytics and Evaluation Project Home Office where necessary before field work starts.

USAID EVALUATION POLICY, APPENDIX 1

CRITERIA TO ENSURE THE QUALITY OF THE EVALUATION REPORT

- The evaluation report should represent a thoughtful, well-researched and well organized effort to objectively evaluate what worked in the project, what did not and why.

- Evaluation reports shall address all evaluation questions included in the scope of work.

- The evaluation report should include the scope of work as an annex. All modifications to the scope of work, whether in technical requirements, evaluation questions, evaluation team composition, methodology or timeline need to be agreed upon in writing by the technical officer.

- Evaluation methodology shall be explained in detail and all tools used in conducting the evaluation such as questionnaires, checklists, and discussion guides will be included in an Annex in the final report.

- Evaluation findings will assess outcomes and impact on males and females.

- Limitations to the evaluation shall be disclosed in the report, with particular attention to the limitations associated with the evaluation methodology (selection bias, recall bias, unobservable differences between comparator groups, etc.).

- Evaluation findings should be presented as analyzed facts, evidence and data and not based on anecdotes, hearsay or the compilation of people's opinions. Findings should be specific, concise and supported by strong quantitative or qualitative evidence.

- Sources of information need to be properly identified and listed in an annex.

- Recommendations need to be supported by a specific set of findings.

- Recommendations should be action-oriented, practical, and specific, with defined responsibility for the action.

14. Budget

The evaluation team will propose an estimated detailed budget in the Evaluation Design Proposal for USAID's approval.

ANNEX B: QUALITATIVE FIELDWORK SCHEDULE

Day	Date	Location	Activity
1	29 Nov	Dar es Salaam	Arrive Dar es Salaam (evening)
2	30 Nov	Dar es Salaam	Meet with MLHHSD, finalize travel schedule and confirm DLO meeting availability, prepare for district field work
3	1 Dec	Dar es Salaam	Finalize Swahili translation of KII and GD questions, and data recording sheets.
4	2 Dec	Iringa District	Travel to Iringa District; Meet with Iringa DLO (KII); KII and GD in MAST pilot 2 village (Itagutwa)
5	3 Dec	Iringa District	KII and GD in MAST pilot 3 village (Kitayawa)
6	4 Dec	Kilolo	Travel to District 2; meet with Kilolo DLO (KII); comparison project #1: village visit (KII and GD)
7	5 Dec	Kilolo	Travel to Mikumi, connect with Kilombero DLO. Synthesize field notes.
8	6 Dec	Mvomero / Morogoro[25]	Travel to Morogoro. Finalize Mvomero schedule with DLO. Quality dimensions scoring for MAST and comparison project #1.
9	7 Dec	Mvomero / Morogoro	Meet with Mvomero DLO (KII); Comparison project #2: village visit (KII and GD)
10	8 Dec	Mvomero / Morogoro	Comparison project #3: village visit (KII and GD). Quality dimensions scoring for comparison project #2.
11	9 Dec	Dar es Salaam	Travel to Dar / Tanzanian Independence Day (National Holiday). Finalize field notes and scoring comparison project #3.
12	10 Dec	Dar	Synthesis and writing day
13	11 Dec	Dar	Break day
14	12 Dec	Rufiji	Travel to Rufiji / Mawlid Day (National Holiday)
15	13 Dec	Rufiji	Meet with Rufiji DLO (KII); comparison project #4: village visit (KII and GD); Travel to Dar
16	14 Dec	Dar es Salaam	Finalize field notes and quality dimensions scoring comparison project #4. Synthesis and writing day.
17	15 Dec	Dar es Salaam	Debrief meeting with USAID; synthesis and writing; evening return to USA

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[25] Schedule change from Kilombero to Mvomero due to change in availability of Kilombero DLO.

ANNEX C: KEY INFORMANT INTERVIEW PROTOCOLS

KEY INFORMANT INTERVIEW SAMPLE

KII Protocol Category	# of KIIs/respondents
Comparative Assessment of MAST Methodology	
1. Village Chairman, Executive Officer or other village government representative	6 (one in each of 2 MAST pilot villages, and in 4 comparison project villages)
2. District Land Officer (DLO)	5 (one in the second MAST Pilot Site district [Iringa] and each of the 4 districts where selected comparison project villages are located)

Introduction and Consent

Prior to all KIIs, the following consent statement should be read out loud to each respondent:

Hello and thank you for being available to talk with us. My name is [name of interviewer]. I work with a group of research organizations in the United States, including Management Systems International and NORC at the University of Chicago. The United Stated Agency for International Development (USAID) has hired us to conduct an independent study of its Mobile Application to Secure Tenure (MAST) project, which uses mobile phones to map and record land rights. As part of this study, we are also learning from similar approaches conducted elsewhere in Tanzania, such as the [COMPARISON PROJECT NAME here in DISTRICT NAME]. The purpose of this interview is to learn about your experience with the [MAST project / COMPARISON PROJECT NAME].

Our role here is to ask questions and listen, since we want to hear your opinions and experience. I also want to mention that there are no right or wrong answers, so please feel free to share with us any ideas that you might have. We are interested in both positive and negative experiences.

We will be recording this interview so that we can focus on what you are telling us and not forget anything that was said. Your identity will be kept confidential and it will not be possible for you to be identified in our study report. If you would prefer we take notes and not use the recorder, please let us know.

Your participation is completely voluntary and you can choose to not answer any question or stop participating at any time. This interview will last approximately 45 minutes. The information you give will be stored safely for the duration of the project and shared anonymously with USAID.

(ead if more than one respondent in KII): We ask that everyone here respect each person's privacy and confidentiality, and not repeat what is said during this discussion. But, please remember that other participants in the group may accidentally share what was said.

If you have any questions about the study, please contact XXX, at this phone number: XXXXXX.

[START THE RECORDER TO GET VERBAL CONSENT]

Do you agree to participate in today's discussion?

[IF THE RESPONDENT SAYS "YES", CONTINUE DISCUSSION]

May we begin?

The following information should be collected for each respondent:

1	Name of respondent	
2	Type of respondent	
3	Agency or Institution (if applicable)	
4	Respondent title or position (if applicable)	
5	Village name	
6	Date of interview	
7	Interview location	
8	Interviewer	
9	Note taker	
10	Start time	
11	End time	
12	Interview duration (minutes)	

KII Protocol #1: Comparative Assessment of MAST Methodology

This guide should be used for the KII with the __Village Executive Officer or other village government representative__. [Enumerator: Prior to the interview, please review the classification matrix and criteria that will be assessed from these data. During the interview, prompt as needed to obtain information relevant to making these classifications.]

We would like to talk with you about the experience in this village with [NAME OF PROJECT] to document land rights and provide CCROs, implemented here during [YEAR OF PROJECT].

1. Do you remember this project? Can you briefly describe what it did? What role did you play in this project?

    Question 1b i: Transparency and inclusiveness of the mapping and verification process

2. Did the [PROJECT] conduct sensitization to inform land users about the mapping, verification, and registration process? Were all villagers included in the awareness raising efforts? Did it include both men and women?
    . What efforts were used to reach different groups of people here in this village with respect to land use and land rights? For example, widows, livestock herders, or other ethnic groups present in this village.
    a. Would you say that almost all villagers were included (>90%), most of them (>50%), or only some(<50%)?

3. Do you think villagers here understood the mapping and verification process under this project? Would you say everyone understood it well, or only some people? Why?

4.   After land mapping took place, did the project include a process for villagers to verify the land rights that were allocated to each person? For example, by posting maps for everyone in the village to check/consult/verify.

   .   Can you tell us about this process? Did everyone in the village have an opportunity to participate and make their views known?
   a.   Did it include both men and women equally?
   b.   Were there any groups or people in the village who were not able to participate? Why?

5.   We'd like to learn about disputes that may have arose or were resolved during this process. Were the disputes many? What were some of the most common types of disputes?

   .   How did villagers here resolve these disputes? What were some of the challenges?
   a.   Did women have more challenges than men?
   b.   Do you think there were any other groups of villagers who had more difficulties resolving disputes?
   c.   In your opinion, was this process effective at verifying land rights for different villagers and resolving land disputes? In the end, were there many households who could not receive a CCRO as a result of disputes?

Question 1b ii: Quality of the data collection and transmission platform (functionality, ease of use, etc)

6.   Since the project concluded, is it common for people in this village to try to access their land information records, for whatever purposes? Why or why not?

   .   Can you explain how the system to access the land records works?
   a.   Do you know if the information is available on the internet?
   b.   Would you say it is easy or difficult to learn how to use this system? Why?

7.   Are there any challenges or concerns that you are aware of with respect to the ability for villagers to access their land information that was collected, for any reason that villagers might have?

Question 1b iii: Requirements for implementation in terms of village time and personnel

8.   Do you remember how many months did it take to complete the mapping and verification in this village?

   .   Were there any unusual situations that caused a longer delay? What were those?
   a.   Do you remember about how many minutes it usually took to survey a typical parcel of land for a household here? (Was it less than 1 hour? Less than 30 minutes? Less than 15 minutes?)

9.   How many people in this village participated in the mapping and verification work during the project? I mean, people who were helping directly to complete the mapping or the verification process here in the village.

   .   How many people from outside the village who participated in this work?
   a.   What kinds of skills were needed for someone to fulfill this role?
   b.   In your opinion, was it easy or difficult to find such people in this village?

KII Protocol #2: Comparative Assessment of MAST Methodology

This guide should be used for the KII with the __District Land Officer__ for each study district.

Question 1b iii: Requirements for implementation in terms of time and personnel

We would like to talk with you about the experience with [NAME OF PROJECT] to document land rights and provide CCROs, implemented in villages in the this district during [YEAR OF PROJECT].

   1.   Do you remember this project? Can you briefly describe what it did?

2. Did you have any role in facilitating this project?

3. Were there any major challenges to implementing this project in villages in this district?

4. Was there any difficulty obtaining staff with the qualifications needed to implement the land mapping and recording land rights information for villager land parcels? For example, the surveyors or other skilled personnel who were needed to collect information in the different project villages? Why or why not? What kinds of skills were needed for someone to fulfill this role? Was it easy to find villagers to do this work in each village?
   . Do you recall how many people in each village participated in the mapping and verification work during the project? I mean, people who were helping directly to complete the mapping or the verification process here in the village.
   a. How many people from outside the village who participated in this work?

5. For a typical village in this district, do you recall how many months did it take to complete the mapping and verification process? Were there any unusual situations that caused a longer delay? What were those?

6. Do you remember about how many minutes it usually took to survey a typical parcel of land for a household here? (Was it less than 1 hour? Less than 30 minutes? Less than 15 minutes?)

Question 1b ii: Quality of the data collection and transmission platform

We would also like to learn about the land information system used by the project.

7. Was the information collected through this project sufficient for your office to carry out its duties with respect to mapping and recording land rights in villages, and maintaining land documentation for households?

8. Did the data provide sufficient information for your office to be able to issue CCROs? If not, explain.

9. What is the level of accuracy of the mapped land data collected through this project (if known)?

10. Can you explain some of the different ways in which your office uses the information that was generated?

11. Is your office able to access the information collected, when needed? Were there any difficulties transmitting to your office the land rights information that was collected for individuals or households?

12. Are land users from the project villages able to access their land information when they need it? Is any of the land information available for land users or others to access directly on the internet?

13. Since the project concluded, is it common for villagers to try to access their land information records, for whatever purposes? Why or why not?

14. Are there any challenges or concerns that you are aware of with respect to the ability for villagers to access their land information that was collected, for any reason that villagers might have?

ANNEX D: GROUP DISCUSSION PROTOCOLS

Group Discussion Sample

GD Protocol Category	Total # of GDs
Comparative Assessment of MAST Methodology at Pilot Site 2 & Comparison Projects	

Cross-section of 10-15 land users who:
   a. Had land mapped through MAST or a comparison project (regardless of CCRO receipt); or
   b. Had not participated, or dropped out prior to CCRO preparation.
	6 (one each in MAST pilot villages 2 and 3; and one in each of 4 comparison project villages)

Introduction and Consent

The Moderator should read the following consent script prior to the start of the group discussion:

Hello and thank you for agreeing to talk with us. My name is [name of interviewer] and I represent _____. Together with me is [name] who will be taking notes during the meeting. Other members of our team work with a group of research organizations in the United States, including Management Systems International and NORC at the University of Chicago. The United States Agency for International Development (USAID) has hired us to conduct an independent evaluation of its MAST project, which uses mobile phones to map and record land rights. As part of this evaluation, we are also learning from similar approaches conducted elsewhere in Tanzania, such as the [COMPARISON PROJECT NAME here in DISTRICT NAME].

The aim of this discussion is to learn from your experiences with the [Mobile Application to Secure Tenure (MAST) project / NAME OF COMPARISON PROJECT]. This project was implemented by the [Cloudburst Group / PROJECT IMPLEMENTOR], and funded by the [United States Agency for International Development, USAID / PROJECT FUNDER]. Please note that there are no "right" or "wrong" answers in this discussion. We would like everyone to share their experience and give feedback, either positive or negative.

Our role here is to ask questions and listen to your opinions and experiences. We will be recording this discussion so that we can make sure we accurately note what you are telling us, and not forget anything that was said. Your identity will be kept confidential and it will not be possible for you to be identified in our study report. If you would prefer we take notes and not use the recorder, please let us know.

Your participation is completely voluntary and you can choose to not answer any question or stop participating at any time. This discussion will last approximately 1 hour. The information you give will be stored safely for the duration of the project and shared anonymously with USAID

If you have any questions about the study, you may contact ____, on this phone number: _____

[START THE RECORDER TO GET VERBAL CONSENT]

Do you agree to participate in today's discussion?

[IF YES, CONTINUE DISCUSSION]

May we begin?

[Facilitator: Remember to fill out the FG participant form and note-taking form for each GD conducted].

General Information to be completed for each participant

For each village council member or community land holder GD participant, ask and document:

Date: Month: _____ Day: ____ Year: 2016	
Type of Focus Group:	

Province / Region Name:	Village / Town Name:

FGD Participants: For each participant, please ask and document:

Participant Number	Ethnicity	Gender	Age	Marital Status (Married, Widowed, Single, Divorced)	Main Occupation (Farmer, Livestock, Pastoralist, Other (Specify))	Mapped land with MAST / other project?	Received CCRO? Y/N (if yes, also list date)	Tried to access land records? Y/N
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								

Moderator:
Note-taker:

Start time: ___ : ___ AM/PM (circle one)	End time: ___ : ___ AM/PM (circle one)

Comments on any aspect of the FGD:

GD Protocol: Comparative Assessment of MAST Methodology

This guide should be used for the GD with resident land users in each study village.

Understanding of Project

We would like to talk with you about the experience in this village with [NAME OF PROJECT] to document land rights and provide CCROs, implemented here during [YEAR OF PROJECT].

1. Do you remember this project? Can you briefly describe what it did? Did anyone here play a role in this project?

Question 1b i: Transparency and inclusiveness of the mapping and verification process

2. Did the project conduct sensitization to inform land users about the mapping, verification, and registration process? Were all villagers included in the awareness raising efforts? Did it include both men and women?
   a. What efforts were used to reach different groups of people here in this village with respect to land use and land rights? For example, widows, livestock herders, or other ethnic groups present in this village.
   b. Would you say that almost all villagers were included (>90%), most of them (>50%), or only some (<50%)?

3. Do you think villagers here understood the mapping and verification process under this project? Would you say everyone understood it well, or only some people? Why?

4. After land mapping took place, did the project include a process for villagers to verify the land rights that were allocated to each person? For example, by posting maps for everyone in the village to check/consult/verify.
   a. Can you tell us about this process? Did everyone in the village have an opportunity to participate and make their views known?
   b. Did it include both men and women equally?
   c. Were there any groups or people in the village who were not able to participate? Why?

5. Was this verification process generally perceived to be fair by all villagers, or did some of the villagers perceive this process to be unfair? Why?

6. We'd like to learn about disputes that may have arose or were resolved during this process. Were the disputes many? What were some of the most common types of disputes?
   a. How did villagers here resolve these disputes? What were some of the challenges?
   b. Did women have more challenges than men?
   c. Do you think there were any other groups of villagers who had more difficulties resolving disputes?
   d. In your opinion, was this process effective at verifying land rights for different villagers and resolving land disputes?
   e. Was the dispute resolution process generally perceived to be fair by villagers? Did some villagers perceive this process to be unfair? Why?
   f. In the end, were there many households who could not receive a CCRO as a result of disputes?

Question 1b ii: Quality of the data collection and transmission platform

7. To what extent do you trust the technology used in this process to accurately capture and transmit your land data? Why or why not? To what extent do you trust the accuracy of the operators of this technology who were collecting this information?

8. Do you think the technology used by the project is a good way to map land used by different households in your village? Why or why not? Is there a better way that you might prefer?

9. Since the project concluded, is there anyone here who has tried to access your land information, for whatever purposes? Why or why not?
    a. Can you explain how the system works?
    b. Do you know if the information is available on the internet?
    c. Would you say it is easy or difficult to learn how to use this system? Why?
10. Are there any challenges or concerns that you are aware of with respect to the ability for villagers to access their land information that was collected, for any reason that villagers might have?

11. Is the land information collected this this process detailed enough to meet your needs? Why or why not?

Question 1b iii: Requirements for implementation in terms of time and personnel

1. From your perspective, were there any unusual situations that caused delays in completing the mapping and verification process in this village? If yes, please can you explain what those were?

2. Is there anyone in this group who participated in the mapping and verification work during the project? I mean, people who were helping directly to complete the mapping or the verification process.
    a. What kinds of skills were needed for someone in this village to do this work?
    b. Based on your experience, was it easy or difficult to find such people in this village?
    c. How did you personally find the time and skills requirement to participate in this work?

ANNEX E: INTERVIEW AND GROUP DISCUSSION PROTOCOLS, SWAHILI TRANSLATIONS

TATHIMINI YA ULINGANISHAJI KATI YA MFUMO WA UPATIKANAJI WA MILIKI YA ARDHI KUTUMIA TECHNOLOGIA YA SIMU YA MKONONI (MAST) NA ILE YA KAWAIDA

DODOSO KWA AJILI YA MAAFISA WA ARDHI WA WILAYA NA WENYEVITI WA VIJIJI

Utaratibu wa kuwachagua watakaohojiwa

Kundi la watakaohojiwa	Idadi
1. Mwenyekiti wa kijiji, mtendaji wa kijiji au kiongozi yeyote wa selikali ya kijiji	6 (mmoja kutoka kila kijiji katika vijiji viwili vya MAST na mmoja kutoka kila vijiji 4 linganishi)
2. Afisa Ardhi wa wilaya (DLO)	5 (mmoja kutoka kijiji cha kwanza cha MAST na mmoja kutoka kila vijiji 4 linganishi)

Utangulizi na ridhaa

Kabla ya mahojiano, ridhaa hii isomwe kwa sauti kwa kila atakaehojiwa

Habari na pia tunashukuru kwa kupata muda wa kujadiliana nasisi. Jina langu ni [jina la mhoji]. nafanya kazi na kundi la mashirika ya utafiti nchini Marekani, ikiwa ni pamoja na Management Systems International na NORC katika Chuo Kikuu cha Chicago.Shirika la Maendeleo ya Kimataifa (USAID) limetuajiri kufanya utafiti huru juu ya MFUMO WA UPATIKANAJI WA MILIKI YA ARDHI KUTUMIA TECHNOLOGIA YA SIMU YA MKONONI (MAST) ambayo inatumia simu za mkononi katika kutathmini na kutunza haki ya matumizi ya ardhi. Kama sehemu ya utafiti huu, tungependa pia kujifunza mbinu mbadala na sawa zilizofanywa mahali pengine katika Tanzania, kama vile [JINA LA MRADI LINGANISHI]. Madhumuni ya mahojiano haya ni kujifunza kuhusu uzoefu wako Juu ya MAST na (TAJA JINA LA MRADI)

Jukumu letu hapa ni kuuliza maswali na kusikiliza kutoka kwenu, kwasabau tunataka kusikia maoni na uzoefu wako. hakuna majibu sahihi au makosa, hivyo tafadhali jisikie huru kushiriki nasi na kutoa mawazo yoyote yale. tunapokea mawazo yeyte yale chanya na hasi.

Tutakuwa tukirekodi mahojiano haya ili tuweze kuzingatia nini mnatuambia na ili tusisahau wala kuacha kitu chochote mtakachokisema. Utakachokisema kitakuwa siri na itakuwa si rahisi kwa wewe kutambulika katika ripoti yetu ya utafiti. Kama ungependelea sisi kuchukua maelezo na si kutumia kinasa sauti, tafadhali tungependa kujua.

ushiriki wako ni hiari kabisa na unaweza kuchagua kutojibu swali lolote au kuacha kushiriki wakati wowote. Mahojiano haya yatachukua dakika 45. Maelezo utakayotoa yatahifadhiwa kwa usalama kwa muda wote wa mradi na tutayasirikisha kwa shirika la USAID bila ya mtoa maelezo kutambulika.

(Soma kama mhojiwa ni zaidi ya mmoja katika Mahojiano maalumu): Tunaomba kwamba kila mtu hapa aheshimu faragha ya kila mtu na usiri, na si kurudia kile alichosema wakati wa mjadala huu. Lakini, tafadhali kumbuka kwamba washiriki wengine katika kundi wanaweza changia ambacho kilishasemwa.

Kama unamaswali juu ya tafiti hii, tafadhali wasiliana na …………….. kwa namba hii: ……………………..

[WASHA KINASA SAUTI KWAAJILI KUREKODI RIDHAA]

Je umeridhia kushiriki katika mahojiano Haya?

[KAMA MHOJIWA ATASEMA "NDIO", ENDELEA NA MJADALA]

Je, Tunaweza kuanza?

Taarifa zifuatazo zichukuliwe kwa kila mhojiwa:

1	**Jina la Mhojiwa**	
2	**Ain ya Mhojiwa**	
3	**Shirika atokalo (kama inafaa)**	
4	**Cheo cha Mhojiwa (Kama inafaa)**	
5	**Jina la Kijiji**	
6	**Tarehe ya Mahojiano**	
7	**Eneo la mahojiano**	
8	**Jina la Mhojaji**	
9	**Jina la mchukua taarifa**	
10	**Muda wa kuanza**	
11	**Muda wa kumaliza**	
12	**Muda uliotumika kwa mhojiano (dakika)**	

Muongozo wa mhojiano maalumu na viongozi/maafisa #1: Comparative Assessment of MAST Methodology

Muongozo huu utumike kwaajili ya mahojiano maalumu na **viongozi wa vijiji**

[Mdodosaji: kabla ya mahojiano, please review the classification matrix and criteria that will be assessed from these data. During the interview, prompt as needed to obtain information relevant to making these classifications.]

Tungependa kuzungumza na wewe kuhusu uzoefu wako katika kijiji hiki juu ya [JINA LA MRADI] ambao walisaidia zoezi la upimaji, uhakiki na uwekaji kumbukumbu ya masuala ya upimaji wa ardhi na haki za matumizi ya ardhi, pia upatikanaji wa hatimiliki za kimila, uliotetekelezwa hapa mwaka [MWAKA WA MRADI].

1.   Je unaukumbuka mradi huu? Unaweza kuulezea? Je ulikuwa na jukumu lipi katika kutekeleza mradi huu?

Swali 1b i: Uwazi na ushirikishwaji wa wanakijiji katika mchakato wa upimaji ardhi na uhakiki

2.   Je mradi wa [PROJECT] ulifanya uhamasishaji ili kuwajulisha watumiaji wa ardhi kuhusu mchakato wa upimaji, uhakiki na usajili wa ardhi? Je wanakijiji wote walihusishwa kwenye michakato hiyo? Je michakato hiyo ilihusisha jinsia zote wanawake na wanaume?
        a.   Je ni juhudi zipi zilitumika kufikia watu wengi hapa kijijini katika utoaji wa elimu ya masuala ya matumizi ya ardhi na haki zake? Kwa mfano, wajane, wafugaji, au makabila mengine hapa kijijini.

b. Je unaweza sema kwamba wanakijiji walio wengi walishirikishwa (>90%), walio wengi (>50%), au baadhi (<50%)?

3. Kutokana na utekelezaji wa mradi huu, Je unadhani wanakijiji wote wanauelewa juu ya mchakato wa upimaji na uhakiki wa ardhi? Je unaweza sema watu wote walielewa, au ni watu wachache tu? kwanini?

4. Baada ya upimaji wa ardhi kusha, je mradi uliweka utaratibu wa wanakijiji kuhakiki ili kujua haki ardhi kwa kila mmoja? Kwa mfano, kwa kubandika ramani kwenye ubao wa matangazo ili kila mmoja aweze kuona/kuuliza/kuhakiki
   a. Je unaweza kuueleezea huu mchakato? Je kila mwanakajiji alipata wasaha wa kushiriki na kutoa maoni yao?
   b. Je mchakato ulihusisha jinsia zote wanawake na wanaume?
   c. Je kulikuwa na kundi/makundi yeyote (kwa mfano walimavu, wajane, watu wenye kipato wa chini, nk) katika kijiji ambao hawakupata nafasi ya kushiriki? kwanini?

5. Tungependa kujua na kujifunza migogoro (mikumbwa na midogo) ambayo ilitokea au iliyotatuliwa wakati huo. Je kuikuwa na migogoro mingi? Ni migogoro ipi ambayo ilijitokeza?
   a. Jinsi gani wanakijiji walitatua migogoro hii? Changamoto zipi zilijitokeza?
   b. Je , wanawake walipata changamoto nyingi kuliko wanaume?
   c. Unadhani kulikuwa na Kundi lingine katika kijiji ambalo walipata ugumu mkubwa kutatua migogoro?
   d. Kwa maoni yako, unadhani mchakato huu ulikuwa na ufanisi katika kuhakiki wa haki ya matumizi ya ardhi kwa kila mwanakijiji na kutatua migogoro? Hatimaye, kulikuwa na kaya ambazo zilikosa hatimiliki za kimila sababu ya migogoro?

Swali 1b ii: Ubora wa mfumo wa ukusanyaji na usambazaji wa taarifa (ufanyaji kazi, urahisi wa kutumia)

6. Kwakuwa mradi umeisha, ni kawaida kwa watu **kuomba na kupata rekodi ya taarifa za masuala ya ardhi** kwa matumizi yeyote yale. Unadhani ni kwanini wanazihitaji au kwanini hawazihitaji?
   a. Unaweza kuelezea ni jinsi gani mfumo huo unafanya kazi?
   b. Unafahamu kama taarifa hizi zinapatikana kwenye mtandao?
   c. Unaweza kusema kwamba ni rahisi au vigumu kutumia mfumo huu? Kwanini?

7. Je, kuna changamoto au wasiwasi wowote kuhusiana na uwezo wa wanakijiji kupata taarifa hizo zilizosanywa (kwa mfano… tukaelaborate hapa).

Swali 1b iii: Mahitaji ya muda na rasilimali watu katika utekelezaji wa mradi

8. Je, unakumbuka ni miezi mingapi ilitumika ili kukamilisha zoezi la upimaji wa ardhi na uhakiki katika kijiji hiki?
   a. Je, kulikuwepo hali yoyote isiyo ya kawaida ambayo ilisababisha ucheleweshwaji huo? Ni zipi hizo?
   b. Je, unakumbuka ni dakika ngapi kwa kawaida huchukua kufanya upimaji wa kipande cha ardhi cha kaya? (Ilikuwa ni chini ya saa 1? Chini ya dakika 30? Chini ya dakika 15?

9. Je ni watu wangapi hapa kijijini walishiriki katika zoezi la upimaji na uhakiki wa vipande vya ardhi wakati wa mradi? Namaanisha watu ambao walikuwa wanasaidia moja kwa moja kukamiliza zoezi zima la upimaji na uhakiki.
   a. Ni watu wangapi kutoka vijiji vingine walishiriki moja kwa moja kusaidia zoezi hili?
   b. Je ni ujuzi gani unahitajika kwa mtu kushiriki/kufanya kazi katika zoezi hili?
   c. Kwa maoni yako, unadhani ni rahisi kupata wafanyakazi wenye sifa kwaajili ya zoezi hili, hapa katika kijiji hiki?

Muongozo wa mhojiano maalumu na viongozi/maafisa #2: Comparative Assessment of MAST Methodology

*Muongozo huu utumike kwa ajili ya mhojiano na **Afisa ardhi wa wilaya** kwa kila wilaya.*

Swali 1b iii: Mahitaji ya muda na rasilimali watu katika utekelezaji wa mradi

Tungependa kuzungumza na wewe kuhusu uzoefu wako katika kijiji hiki juu ya [JINA LA MRADI] ambao walisaidia zoezi la upimaji, uhakiki na uwekaji kumbukumbu ya masuala ya ardhi na haki zake, pia upatikanaji wa hatimiliki za kimila, uliotetekelezwa kwenye vijiji vya wilaya hii mwaka [MWAKA WA MRADI].

1. Je unaukumbuka mradi huu? Unaweza kuulezea? Je ulikuwa na jukumu lipi katika kutekeleza mradi huu?
2. Je ulikuwa na jukumu lolote kusaidia au kuwezeza/kutekeleza mradi huu?
3. Je, kulikuwa na changamoto zozote katika utekelezaji wa mradi huu kwenye vijiji vya wilaya yako?
4. Je kulikuwa na ugumu wowote kupata wafanyakazi wenye sifa zinazohitajika katika zoezi la upimaji wa ardhi na kurekodi taarifa za haki ya matumizi ya ardhi? kwa mfano, wapimaji au wafanya kazi wenye ujuzi unohitajika kukusanya taarifa katika vijiji mbalimbali? Kwanini kuna ugumu au kwanini hakuna ugumu? Ni ujuzi gani unahitajika katika kazi hii? Je ilikuwa ni rahisi kupata wanakijiji wenye sifa?
   a. Je ni watu wangapi hapa kijijini walishiriki katika zoezi la upimaji na uhakiki wa vipande vya ardhi wakati wa mradi? Namaanisha watu ambao walikuwa wanasaidia moja kwa moja kukamiliza zoezi zima la upimaji na uhakiki.
   b. Ni watu wangapi kutoka vijiji vingine walishiriki moja kwa moja kusaidia zoezi hili?
5. Chukulia kijiji cha kawaida katika wilaya hii, unakumbuka ni miezi mingapi ilitumika ili kukamilisha zoezi la upimaji wa ardhi na uhakiki katika kijiji? Je, kulikuwepo hali yoyote isiyo ya kawaida ambayo ilisababisha ucheleweshwaji huo? Ni zipi hizo?
6. Je, unakumbuka ni dakika ngapi kwa kawaida huchukua kufanya upimaji wa kipande cha ardhi cha kaya? (Ilikuwa ni chini ya saa 1? Chini ya dakika 30? Chini ya dakika 15?

Swali 1b ii: Ubora wa mfumo wa ukusanyaji na usambazaji wa taarifa

Tungependa kujua kuhusu mfumo wa ukusanyaji na uhifadhi wa taarifa uliotumika na mradi.

7. Je, taarifa zilizokusanywa kupitia mradi huu zilitosha kwa ajili ya matumizi ya ofisi yako ili kutekeleza majukumu yake kwa maana ya taarifa za upimaji na kurekodi haki ya matumizi ya ardhi katika vijiji, na kuhifandhi nyaraka za ardhi kwa ajili ya kaya za wilaya hii?
8. Je, taarifa hizo zinakidhi mahitaji ya taarifa zitakazowezesha ofisi yako kutoa hati miliki za kimila? Kama sio, tafadhari elezea
9. Tuambie kiwango cha usahihi wa taarifa za upimaji wa ardhi ambazo zimekusanywa na mradi huu (Kama zinajulikana)?
10. Je unaweza kuelezea matumizi mbalimbali ya taarifa zinazokusanywa yanayofanywa na ofisi yako?
11. Je ofisi yako inauwezo wa kuzipata na kutumia taarifa zilizokusanywa? Pale zitakapohitajika? Je kulikuwa na ugumu wowote wa taarifa za haki ardhi za watu au kaya binafsi kukufika kwenye ofisi yako?
12. Je watumiaji wa ardhi kutoka vijiijni, wanauwezo wa kuzipata taarifa za ardhi pale zinapohitajika? Je taarifa hizo zinapatika kiurahisi kwa watumiaji wa ardhi au zinapatikana moja kwa moja kweye mtandao?
13. Kwakuwa mradi umeisha, ni kawaida kwa watu kuomba na kupata rekodi ya taarifa za masuala ya ardhi kwa matumizi yeyote yale. Unadhani ni kwanini wanazihitaji au kwanini hawazihitaji?
14. Je, kuna changamoto au wasiwasi wowote kuhusiana na uwezo wa wanakijiji kupata taarifa zao za ardhi ambazo zilikusanywa,

Muongozo wa majadiliano kwa kikundi: Comparative Assessment of MAST Methodology

Utangulizi na ridhaa ya washiriki katika majadiliaono

Muendeshaji wa majadiliano asome ridhaa hii kwa sauti kabla ya kuanza majadiliano hayo:

Habari, tunashukuru kwa kupata muda wa kujadiliana nasisi. Jina langu ni [jina la mhoji]. nafanya kazi na kundi la mashirika ya utafiti nchini Marekani, ikiwa ni pamoja na Management Systems International na NORC katika Chuo Kikuu cha Chicago.Shirika la Maendeleo ya Kimataifa (USAID) limetuajiri kufanya utafiti huru juu ya MFUMO WA UPATIKANAJI WA MILIKI YA ARDHI KUTUMIA TECHNOLOGIA YA SIMU YA MKONONI (MAST) ambayo inatumia simu za mkononi katika kutathmini na kutunza haki ya matumizi ya ardhi. Kama sehemu ya utafiti huu, tungependa pia kujifunza mbinu mbadala na sawa zilizofanywa mahali pengine katika Tanzania, kama vile [JINA LA MRADI LINGANISHI]. Madhumuni ya mahojiano haya ni kujifunza kuhusu uzoefu wako Juu ya MAST na (TAJA JINA LA MRADI)

Jukumu letu hapa ni kuuliza maswali na kusikiliza kutoka kwenu, kwasabau tunataka kusikia maoni na uzoefu wako. hakuna majibu sahihi au makosa, hivyo tafadhali jisikie huru kushiriki nasi na kutoa mawazo yoyote yale. tunapokea mawazo yeyte yale chanya na hasi.

Tutakuwa tukirekodi mahojiano haya ili tuweze kuzingatia nini mnatuambia na ili tusisahau wala kuacha kitu chochote mtakachokisema. Utakachokisema kitakuwa siri na itakuwa si rahisi kwa wewe kutambulika katika ripoti yetu ya utafiti. Kama ungependelea sisi kuchukua maelezo na si kutumia kinasa sauti, tafadhali tungependa kujua.

ushiriki wako ni hiari kabisa na unaweza kuchagua kutojibu swali lolote au kuacha kushiriki wakati wowote. Mahojiano haya yatachukua dakika 45. Maelezo utakayotoa yatahifadhiwa kwa usalama kwa muda wote wa mradi na tutayasirikisha kwa shirika la USAID bila ya mtoa maelezo kutambulika.

[Muwezeshaji: Kumbuka kujaza fomu ya ushiriki katika majadiliano ya kikundi, pia rekodi majadiliano hayo].

Kama unamaswali juu ya tafiti hii, tafadhali wasiliana na ………………. kwa namba hii: ………………………

[WASHA KINASA SAUTI KWAAJILI KUREKODI RIDHAA]

Je umeridhia kushiriki katika mahojiano Haya?

[KAMA MHOJIWA ATASEMA "NDIO", ENDELEA NA MJADALA]

Je, Tunaweza kuanza?

Taarifa za jumla; Zijazwe kwa kila Mhojiwa

For each village council member or community land holder GD participant, ask and document:

Date: Month: _____ Day: _____ Year: 2016

Type of Focus Group:

Province / Region Name:	Village / Town Name:

FGD Participants: For each participant, please ask and document:

Participant Number	Ethnicity	Gender	Age	Marital Status (Married, Widowed, Single, Divorced)	Main Occupation (Farmer, Livestock, Pastoralist, Other (Specify))	Mapped land with MAST / other project?	Received CCRO? Y/N (if yes, also list date)	Tried to access land records? Y/N
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								

Moderator: Note-taker:

Start time: ____ :____ AM/PM (circle one)	End time: ____ :____ AM/PM (circle one)

Comments on any aspect of the FGD:

Muongozo wa majadiliano kwa kikundi: Comparative Assessment of MAST Methodology

Muongozo huu utumike katika mahojiano na <u>watumiaji wa ardhi katika kijiji husika</u>.

Uelewa kuhusu mradi

Tungependa kuzungumza na wewe kuhusu uzoefu wako katika kijiji hiki juu ya [JINA LA MRADI] ambao walisaidia zoezi la upimaji, uhakiki na uwekaji kumbukumbu ya masuala ya ardhi na haki zake , pia upatikanaji wa hatimiliki za kimila, uliotetekelezwa kwenye hiki kijiji [MWAKA WA MRADI].

1. Je unaukumbuka mradi huu? Unaweza kuulezea? Je ulikuwa na jukumu lipi katika kutekeleza mradi huu?

Swali 1b i: Uwazi na ushirikishwaji wa wanakijiji katika mchakato wa upimaji ardhi na uhakiki

2. Je mradi wa [Taja MRADI] ulifanya uhamasishaji ili kuwajulisha watumiaji wa ardhi kuhusu mchakato wa upimaji, uhakiki na usajili wa ardhi? Je wanakijiji wote walihusishwa kwenye michakato hiyo? Je michakato hiyo ilihusisha jinsia zote wanawake na wanaume?
   a. Je ni juhudi zipi zilitumika kufikia watu wengi hapa kijijini katika utoaji wa elimu ya masuala ya matumizi ya ardhi na haki zake? Kwa mfano, wajane, wafugaji, au makabila mengine hapa kijijini.
   b. Je unaweza sema kwamba wanakijiji walio wengi walishirikishwa (>90%), walio wengi (>50%), au baadhi (<50%)?

3. Kutokana na utekelezaji wa mradi huu, Je unadhani wanakijiji wote wanauelewa juu ya mchakato wa upimaji na uhakiki wa ardhi? Je unaweza sema watu wote walielewa, au ni watu wachache tu? kwanini?

4. Baada ya upimaji wa ardhi kusha, je mradi uliweka utaratibu wa wanakijiji kuhakiki ili kujua haki ardhi kwa kila mmoja? Kwa mfano, kwa kubandika ramani kwenye ubao wa matangazo ili kila mmoja aweze kuona/kuuliza/kuhakiki
   a. Je unaweza kuueleezea huu mchakato? Je kila mwanakajiji alipata wasaha wa kushiriki na kutoa maoni yao?
   b. Je mchakato ulihusisha jinsia zote wanawake na wanaume?
   c. Je kulikuwa na kundi/makundi yeyote (kwa mfano walimavu, wajane, watu wenye kipato wa chini, nk) katika kijiji ambao hawakupata nafasi ya kushiriki? kwanini?

5. Je kwa ujumla mchakato huu wa uhakiki ulionekana kuwa wa haki na usawa kwa kila mwanakijiji au baadhi ya wanakijiji waliona kuwa sio wa haki? Kwa nini?

6. Tungependa kujua na kujifunza migogoro (mikubwa na midogo) ambayo ilitokea au iliyotatuliwa wakati huo. Je kuikuwa na migogoro mingi? Ni mogogoro ipi ambayo ilijitokeza mara kwa mara?
   a. Wanakijiji walitatuaje migogoro hiyo? Kulikua na changamoto gani?
   b. Je wanawake walipata changamoto nyingi kuliko wanaume?
   c. Unafikiri kuna kundi lingine la wanakijiji linapata ugumu/ changamoto nyingi katika kutatua migogoro?
   d. Kwa mawazo yako, unafikiri mchakato huu ulikua na ufanisi katika kuhakiki haki za umiliki wa ardhi kwa wanakijiji mbalimbali na kutatua migogoro ya ardhi?
   e. Je mchakato wa utetuzi kwa ujumla ulionekana kuwa wa usawa na wanakijiji? Je baadhi ya wanakijiji waliona mchakato huu kua sio wa usawa wa jinsia? Kwa nini?
   f. Je, kulikua na kaya nyingi ambazo hazikupata hati za kimila za umiliki wa ardhi kwa sababu ya migogoro?

Swali 1b ii: Ubora wa mfumo wa ukusanyaji na usambazaji wa taarifa
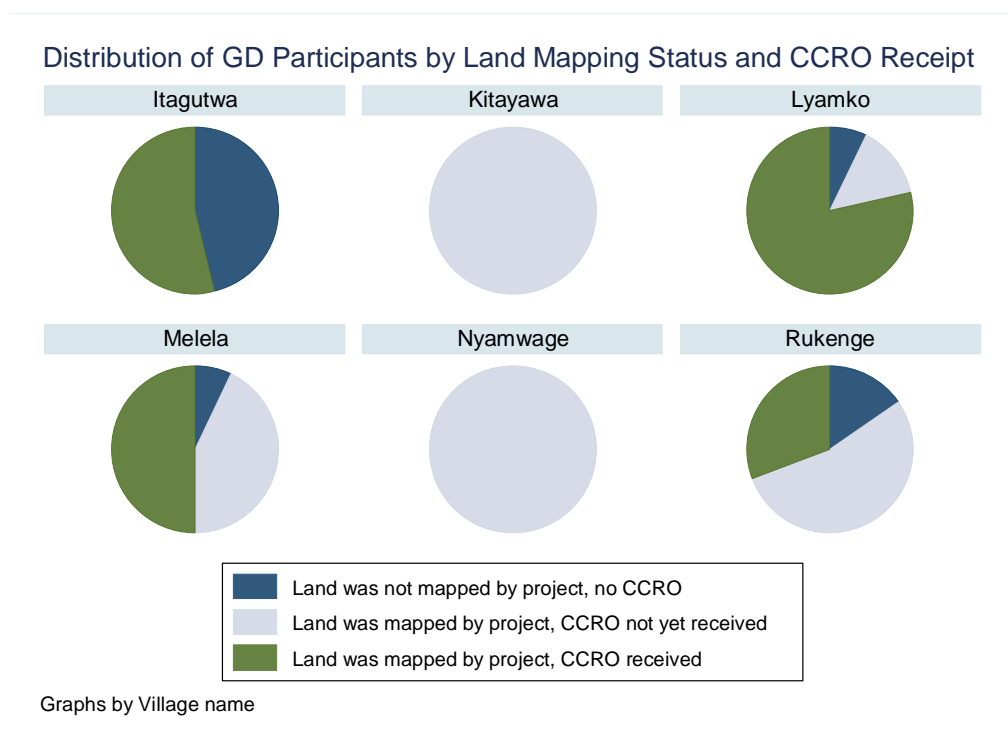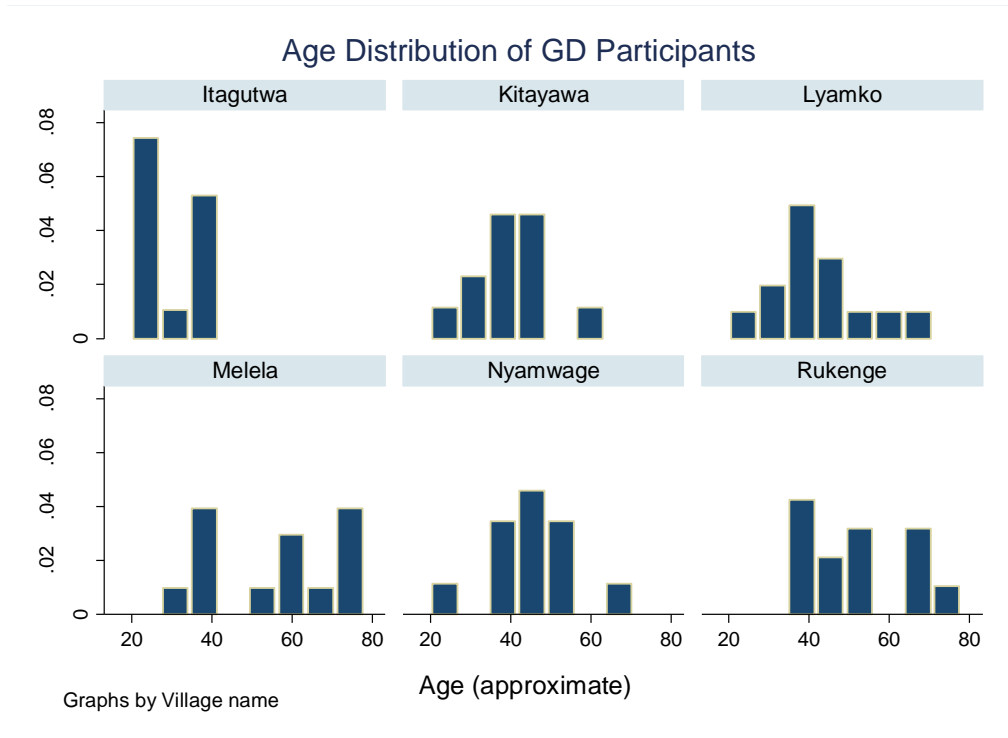
7. Kwa kiasi gani unaamini teknolojia inayotumika katika mchakato huu kukusanya na kusambaza takwimu za ardhi kwa usahihi? Kwanini ndio au hapana? Kwa kiasi gani unaamini usahihi wa waendeshaji wa teknolojia ambao wanakusanya taarifa hizo?

8. Unafikiri technolojia inayotumika na mradi ni njia nzuri na sahihi ya kupima ardhi inayotumika na kaya mbalimbali katika kijiji chenu? Kwa nini ndio au hapana?

9. Tangu mradi uhitimishwe, kuna yeyote hapa alijaribu kuzipata taarifa zake za ardhi kwa matumizi yoyote? Kwa nini ndio au hapana?
    a. Unaweza kuelezea jinsi mfumo unavyofanya kazi?
    b. Je unajua kama taarifa zinapatikana kwenye mtandao?
    c. Je unaweza kusema ni rahisi au ni vigumu kujifunza jinsi ya kutumia mfumo huu? kwanini?

10. Kuna wasiwasi au changamoto unazozifahamu kuhusiana na uwezo wa wanakijiji kupata taarifa zao za ardhi zilizokusanywa kwa sababu zozote wanazokua nazo kwajili ya matumizi yao?

11. Je taarifa za ardhi zilizokusanywa katika mchakato huu ni za kina kutosha mahitaji yenu? Kwa nini ndio au hapana?

Swali 1b iii: Mahitaji ya muda na rasilimali watu katika utekelezaji wa mradi

3. Kwa mtazamo wako, kuna hali yeyote isiyo ya kawaida inayosababisha kuchelewa kukamilika kwa mchakato wa upimaji na uhakiki wa ardhi katika kijiji? Kama ndio tafadhali elezea ni ipi.

4. Je ni watu wangapi hapa kijijini walishiriki katika zoezi la upimaji na uhakiki wa vipande vya ardhi wakati wa mradi? Namaanisha watu ambao walikuwa wanasaidia moja kwa moja kukamiliza zoezi zima la upimaji na uhakiki.
    a. Je ni ujuzi gani unahitajika kwa mtu kushiriki/kufanya kazi katika zoezi hili?
    b. Kwa maoni yako, unadhani ni rahisi kupata wafanyakazi wenye sifa kwaajili ya zoezi hili?
    c. Wewe binafsi unaonaje muda na ujuzi unaohitajika kushiriki katika kazi hii umeridhika nao?

ANNEX F: GROUP DISCUSSION PARTICIPANT CHARTS

Age Distribution of GD Participants

Graphs by Village name

Age (approximate)

Distribution of GD Participants by Land Mapping Status and CCRO Receipt

- Land was not mapped by project, no CCRO
- Land was mapped by project, CCRO not yet received
- Land was mapped by project, CCRO received

Graphs by Village name

Distribution of GD Participants by Ethnicity
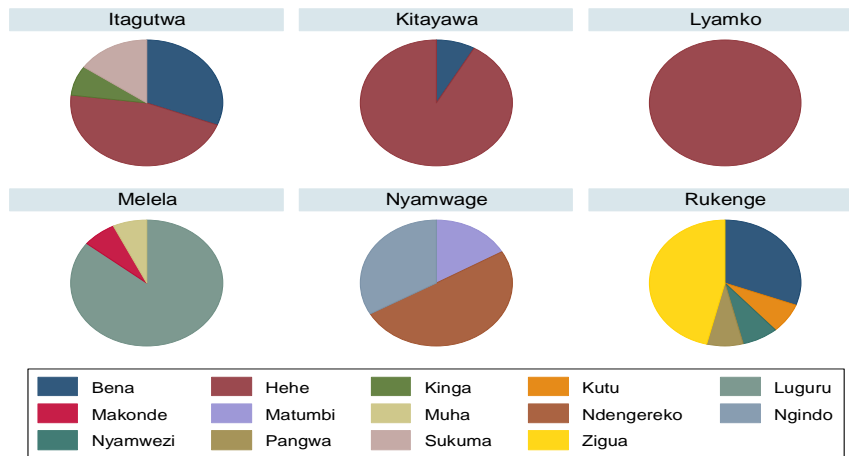
Graphs by Village name

Distribution of GD Participants by Gender
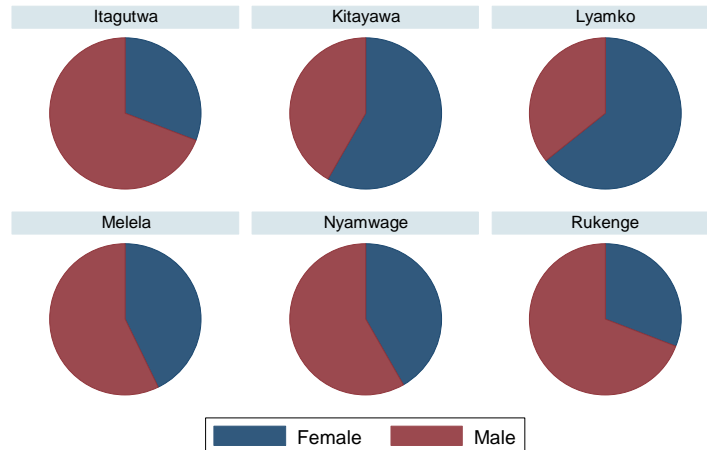
Graphs by Village name

Distribution of GD Participants by Marital Status
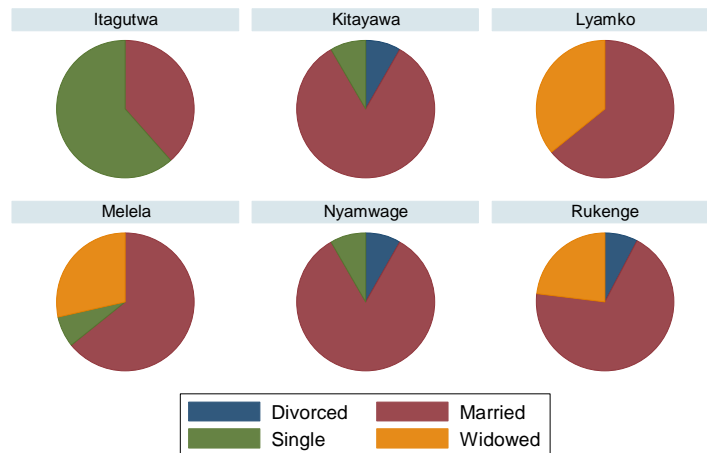
Graphs by Village name

ANNEX G: PROJECT QUALITATIVE SCORING MATRIX

Dimension/ Quality Criteria	MAST	MLHHSD	MKURABITA - Melela	Haki Ardhi	MKURABITA - Rufiji
I. Transparency and inclusiveness of the mapping and verification process					
Inclusive sensitization: *(Villagers)*	• Used multiple means to reach people – both through a village meeting and hamlet by hamlet. • Information also publically posted. • 90% of villagers estimated to attend. • Agreement that all villagers – even vulnerable groups – were included.	• Held village and hamlet meetings and had land committee members followed up with people at their homes (vulnerable people). • 70% reported reached, Women attended more. • Herders were left out - villagers reported their uninterested in process.	• Held village meeting to approve project[26]. • 75% attended public meeting. • More women than men. Prefer that men tend fields, so women attend meeting. • Those that didn't attend were traveling, old men, blind/disabled	• Held village meeting and land committee members confirmed information with people. • 90% of people of attended the meeting. • More women than man. • Only 300 plots mapped – available to first people interested.	• Held meeting with whole village and village council. • 80% of villagers attended. • Village satisfied with sensitization. More women than men attended. • Created own village rule - split land between husband and wife.
Score	5	3	4[27]	3	4[28]
Broad understanding of process: *(Villagers)*	• Most people understood – especially women. • 75-80% of people were reported to understand. • Men were less interested in process or not available for meetings. Older people less interested since didn't see benefit.	• Most people that attended the meeting understood. • 25% of people didn't understand – including people that lived far away, herders, old men, and people not interested in process.	• There was broad understanding. • Estimated 98% of people understood. • More understanding by women about rights. • Encouraged to split land between husband and wife rather than joint register.	• Many people didn't understand the rights and the benefits of CCRO. • 60 - 80% of villagers were estimated to understand. • Villagers told later to contribute Tsh 3,000 for mapping & CCRO.	• Reported that most if not all people understood. • People reported they were engaged and happy at the beginning of the process.
Score	3	3	3	2	4
Broad consultation (verification):	• Information first confirmed at time of mapping on the cellphone.	• When map prepared - had to check and sign	• Broad public process – held village meeting to check boundaries	• Individuals were told to come to the village office to verify the	• Neighbors and land user were both involved in verification.

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[26] During VLUP, the village was sub-divided into two villages by designating a hamlet populated by herders to be a second village. As a result, members of the second village were not part of the mapping process.

[27] This village appeared to have herder disenfranchisement.

[28] This village had prior sensitization on gender issues due to prior activities of other NGO projects.

(Villagers)	• Public village wide public verification of certificates. • GD felt that everyone had an opportunity to confirm and sign certificate - People were assisted when needed.	name -felt it was open - included women. • Not all farmers were at plots when they were mapped or when the beacons were placed. • Herders largely did not participate.	collected by GPS and information on forms. Had to be reviewed by neighbor and land user. • No reported gender issues or vulnerable groups left out.	information on the form (less public). • Land users went around with surveyors.	• Many errors during verification; 3 rounds required. • Villagers have not received CCROs, thus disenchanted with the process; do not have faith in accuracy of their information.
Score	4	3	4	3	4
Fairness of verification and dispute resolution process: (Villagers)	• Neighbors and user must be present for mapping. • Conflicts resolved through discussion. • Women's group helped women and widows that had any issues. • Some people didn't understand as well (e.g. farming someone else's plot or what to do when other family graves are on the land).	• Surveyors mapped without owner present. Mapped where beacons were. • Surveyors not always present at scheduled times. • Mapping took place in rainy season; access difficulties and not everyone's plots could be mapped. • Herders did not participate. • 25% of villagers did not get land mapped by project end.	• Neighbor and land user must be present for mapping. • Conflicts discussed through with neighbors – once resolved were allowed to move ahead with process. • Clarified the law; wife/children can inherit land.	• Some conflicts (e.g. when husband had 2 wives). • Confusion on inheritance; disputes over whose name to list on form. • Children prioritized as beneficiaries or owners, over wives. Women were not empowered. • Surveyors did not measure certain plots.	• Village land committee accompanied district surveyors; users and neighbors present for own land mapping. • Some conflicts, but resolved • Did not map any land located in an area of village-to-village dispute; those people unable to participate.
Score	4	3	4	3	3
Effectiveness of verification and dispute resolution process: (Villagers)	• Fairly few disputes. • Disputes were about common issues – e.g. boundaries, inheritance. • Estimate 10 – 25% of the village HHs did not get	• Few disputes; most resolved via discussion. • Some boundary conflicts when land user or neighbor were not	• Most villagers reported that the process decreased conflicts. • Estimate 10 – 30 plots[29] were not	• Reported it was effective - system better than what they would have done.	• No formal process to resolve conflict – villagers able to work together to resolve disputes. • Some family conflicts, but most resolved.

[29] 760 CCROs were issued at this village.

	CCROs due to conflict. (Including people that weren't measured because of dispute.)	• both present at mapping. • Enduring conflicts with herders, who remove beacons.	mapped due to conflict - mostly on boundaries, some inheritance issues.	• Villagers felt there is less conflict now because of CCROs.	• Everyone that wanted land map got it.
Score	4	3	4	4[30]	3[31]
Sub-Score (out of 25)	20	15	19	15	18
II. Quality of the land information system (data collection and transmission) in terms of accuracy, functionality, ease of use and accessibility					
Accuracy: (District Officers)	• Provided accurate information. • Software would not let you map on a road, a reserve.	• GPS accurate, but issue with errors in land user data entered. • Estimated 70% accurate. • Easy to edit since all information is in a database.	• GPS accurate, but issue with errors in user data entered. • Estimated 70% accurate. • Easy to edit since all information is in a database.	• Some issues with accurate GPS readings due to topography. • Information was sufficient for the form.	• Accurate; only proceeding with mapping if less than 6m error.
Score	4	4	4	3	4[32]
Accuracy (Villagers)	• Trusted the technology and its accuracy.	• Villagers trusted information and that maps showed their plots accurately.	• Villagers now use certificate to know how large someone's land is. • Have confidence – only small % had GPS error	• Villagers trusted information and that map showed plots accurately. • Trusted surveyors - better than what village could do.	• Villagers trusted the mapping at the time, but not later due to information errors. • Required 3 rounds of verification.
Score	5	4	4	4	2
Functionality: (District Officers)	• Problem with system editing access system - permission from Implementer.	• Everything in central database - easy to make changes and corrections.	• Everything in central database - easy to make changes and corrections.	• Information stored on an unbacked-up computer; information was lost.	• Building a database currently, however no coordinated system at time of project.

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[30] Land was outside of village might play role in less conflict.
[31] This village had a major boundary dispute with neighboring village that took several years to resolve. District was somewhat involved, but required villages to resolve issue to move forward.
[32] DLO interviewed had not been involved in project implementation, however the land surveyor present for the village KII and GD had been.

				• Limitations working only with paper files.	
Score	3	4	4	2	3[33]
Ease of use: *(District Officers)*	• Few issues accessing user data. • Some training needed and small issues needed to be worked out after MAST.	• Easy to make corrections and use database for statistics.	• Easy to make corrections and use database for statistics.	• All records are in paper form – challenges in using information.	• Use data for statistics (e.g. how many women have farms). • Database useful now; but relied on paper at time of project.
Score	3	4	4	2	2
Conformance to standards: *(District Officers)*	• Government considering adopting MAST template to use nationally – provides all needed information.	• Yes, and can use this data for other statistics that they could not easily do before.	• Yes, and can use this data for other statistics that they could not easily do before.	• Yes, collects the needed information for the district.	• Reported that necessary data is collected - but not in system that allows them to do more with the information.
Score	5	4	4	3	3
Information accessibility to village land users	• Can access from village or district – but usually not needed. • No real interest in accessing on internet – villagers not sure why they would need to do this and don't always have access to smart phone.	• Most had not received CCRO due to reluctance to pay an uncommunicated fee[34]. • Villagers did not see benefit of CCRO. • District office is far. District staff try to circulate to the villages. • Aware of database at district - can look up information easily.	• People only seek access when a change is required to the CCRO. • Difficult to get to District – cost of transportation. District staff try to circulate to the villages. • Many land changes since CCRO prep – village uing a register system to track these changes informally.	• Not common for people to ask for CCRO. • Villagers unclear on why they would need to access them or the benefits. • Paper based system is a challenge.	• Did not receive CCROs. • Aware that forms are kept at district – difficult to go there. • Paper based system creates challenges obtaining information.

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[33] Rating based on at time of project, when only had paper records.
[34] Fee reported as initially 10,000 shillings, for district; then increased to 12,500 shillings to include village fee.

			• Aware of database at district - can look up information easily.		
Score	4	2	3[35]	3	2
Sub-total (out of 30)	24	22	23	17	16
III. Requirements for implementation in terms of time and personnel at both the village and district levels					
Reasonable time to implement *(District Officers)*	• 3 -4 months for full process - sensitization to verification - not including CCRO issued. • Small plot - 15 mins Large plot - 30 mins	• 3 months total for full process - sensitization to verification - not including CCRO issued. • 1 hectare – 30 minutes - but depends on land.	• 50 days in the village. Not including CCRO issue. • One hectare - no more 30 mins - but depends on land.	• 30 days per village to map all the farms - but not the whole village because depends on budget. • 1 hectare - 30 mins. Depends on shape. Can take 1 hour for 1 acre. 50 hectares – 1 to 3 hours - if rougher land.	• 1 week to map a village. • Didn't know how long whole process would take for full village. • 1 hectare – 30 minutes • 50 hectare – 1 to 3 hours
Score	3	3	3	3	3[36]
Reasonable time to implement *(Villagers)*	• 2 – 3 months to verification. CCROs pending, waiting for 6 months. • Small plot – 10 – 20 minutes • Large plot – 30 minutes.	• 4 months total process to verification. • 8 months total until arrival of 1st CCRO. • Mapping during rainy session, made it more difficult. • 2 hectares – 30 minutes	• Not satisfied with surveyor time. Too short time, people missed out. • Not happy with time to CCRO - waiting since 2009. • 1 hectare -15 mins. • 10 hectares- 20 minutes – but depends on plot.	• 2 months for mapping - CCROs started to arrive 3-5 months later. • Some were told their plots would be measured but surveyors never came. • 1 hectare- 30 minutes. • 12 hectares – 3 hours. Some uncleared areas took up to 4 hours.	• 1 year - mapping took 2 weeks, 2-3 month gap for each verification. • Villagers not satisfied since haven't received CCRO. • 1 hectares - 6-7 mins. • 5 hectares - 20 mins. - depend on plot.
Score	3	2	2	2	3[37]

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[35] Most CCROs have not been issued - using informal system to track changes at village level.

[36] Although one week appears to be a short time (and could not be confirmed with the DLO, as it was not present then), there is also less farming in this village, and relatively few plots mapped here.

[37] Two weeks seems short (Ministry records show that 549 plots were mapped) - less farming in village so many smaller plots may have contributed.

Feasible personnel requirements: (District Officers)	• No major challenges finding people with requirements. • Minimum training required.	• No problems at all	• No problems at all	• Staff constraints: borrow from other districts or university. • Rely on prior experience.	• No problem with staff (GIS and Topomap); working with imagery more challenging • 9 GPS total. They had more but some broke.
Score	4	4	4	2	3[38]
Feasible personnel requirements *(Villagers)*	• No difficulties finding people to train in the villages on MAST app use for mapping.	• I villager per survey team - worked to put beacons or clear areas. • State they could do surveying with GPS training – but capacity appears low.	• 8 people for paid work. Must know village history and areas, write well, no problems with development. • Villagers say capacity to learn GPS.	• Land committee assists on non-technical. Not hard to find people for this. • Villagers thought they had capacity to learn GPS with training,	• No villager involved in technical work. Some knew GPS due to prior projects. • 10 Villagers on land use council went with surveyors (non-technical assistance)
Score	4	2	3	3	4
Sub-Score (out of 20)	14	11	12	10	13
Total Score *(Out of 75)*	**58**	**48**	**54**	**42**	**37**

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[38] Based on issue to scale - satellite limitation and GPS limitation.

ANNEX H: PER PARCEL ESTIMATED COST MATRICES PER CCRO PREPARED

Unadjusted Costs	Constant 2010 dollars														
	MAST	MLHHSD			MKURABITA						Hakiardhi			World Bank PSCP	
Input	Iringa	Bagamoyo	Babati	Mvomero	Ludewa	umbawang	Kilombero	Mbarali	Rufiji	Mvomero	Kilolo	Mufindi	Mkinga	Babati	Bariadi
Personnel	36,225	17,571	0	265,968	12,865	16,349	13,114	16,349	0	19,059	0	0	0	0	0
Facilities	1,531	67,954	0	0	0	0	0	0	0	0	0	0	0	21,294	27,233
Administration	4,834	4,292	3,604	40,720	764	1,880	821	1,497	192	514	13	9	6	11,132	11,132
Materials and Equipment	1,413	16,425	14,662	184,996	0	0	0	0	0	0	1,894	1,298	844	46,494	46,494
Travel	24,319	0	0	0	326	426	635	213	9,598	468	41,058	24,635	12,317	0	0
Training	3,194	24,962	0	0	4,556	2,929	1,753	2,369	7,574	3,091	0	0	0	1,261	1,261
Workshops	3,683	0	10,918	11,918	356	0	0	0	600	426	0	0	0	15,799	47,351
Service Delivery	41,630	0	36,861	215,296	22,851	18,446	22,836	19,307	27,637	17,102	167	167	167	417,355	467,242
Required client inputs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Input Costs (a)	116,830	131,204	66,045	718,898	41,718	40,030	39,160	39,734	45,602	40,660	43,132	26,109	13,335	513,335	600,713
Cost to country office (10% of (a))	11,683	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross Cost	143,771	131,204	66,045	718,898	41,718	40,030	39,160	39,734	45,602	40,660	43,132	26,109	13,335	513,335	600,713
Income via project implementation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Costs	143,771	131,204	66,045	718,898	41,718	40,030	39,160	39,734	45,602	40,660	43,132	26,109	13,335	513,335	600,713

Project Information															
Number of CCROs	3017	4100	4400	5000	2126	947	2678	1463	1995	2064	1852	1313	901	17500	17500
Villages	2	2	4	97**	2	2	2	2	5	2	10	6	3	9	9
Year	2014	2006	2012	2013	2012	2010	2012	2010	2009	2010	2015	2015	2015	2010	2010

Cost per Parcel Indicator															
Unadjusted cost per CCRO prepared ($)	47.7	32.0	15.0	143.8	19.6	42.3	14.6	27.2	22.9	19.7	23.3	19.9	14.8	29.3	34.3

Adjusted Costs

Input	Constant 2010 dollars														
	MAST	MLHHSD			MKURABITA						Hakiardhi			World Bank PSCP	
	Iringa	Bagamoyo	Babati	Mvomero	Ludewa	umbawang	Kilombero	Mbarali	Rufiji	Mvomero	Kilolo	Mufindi	Mkinga	Babati	Bariadi
Personnel	36,225	17,571	0	265,968	12,865	16,349	13,114	16,349	0	19,059	12,443	8,821	6,053	0	0
Facilities	1,531	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Administration	4,834	4,292	3,604	40,720	764	1,880	821	1,497	192	514	13	9	6	11,132	11,132
Materials and Equipment	1,413	16,425	14,662	184,996	0	0	0	0	0	0	1,894	1,298	844	46,494	46,494
Travel	24,319	0	0	0	326	426	635	213	9,598	468	41,058	24,635	12,317	0	0
Training	3,194	0	0	0	4,556	2,929	1,753	2,369	7,574	3,091	0	0	0	1,261	1,261
Workshops	3,683	0	10,918	11,918	356	0	0	0	600	426	0	0	0	15,799	47,351
Service Delivery	41,630	0	10,465	215,296	13,788	12,228	13,335	13,088	19,824	10,046	167	167	167	353,973	424,341
Required client inputs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Input Costs (a)	**98,717**	**38,288**	**39,649**	**718,898**	**32,655**	**33,811**	**29,658**	**33,515**	**37,789**	**33,605**	**55,575**	**34,930**	**19,388**	**428,659**	**530,580**
Cost to country office (10% of (a))	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross Cost	**98,717**	**38,288**	**39,649**	**718,898**	**32,655**	**33,811**	**29,658**	**33,515**	**37,789**	**33,605**	**55,575**	**34,930**	**19,388**	**428,659**	**530,580**
Income via project implementation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Costs	**98,717**	**38,288**	**39,649**	**718,898**	**32,655**	**33,811**	**29,658**	**33,515**	**37,789**	**33,605**	**55,575**	**34,930**	**19,388**	**428,659**	**530,580**

Project Information															
Number of CCROs	3017	4100	4400	5000	2126	947	2678	1463	1995	2064	1852	1313	901	17500	17500
Villages	2	2	4	97**	2	2	2	2	5	2	10	6	3	9	9
Year	2014	2006	2012	2013	2012	2010	2012	2010	2009	2010	2015	2015	2015	2010	2010

Cost per Parcel Indicator															
Adjusted cost per CCRO prepared ($)	**32.7**	**9.3**	**9.0**	**143.8**	**15.4**	**35.7**	**11.1**	**22.9**	**18.9**	**16.3**	**30.0**	**26.6**	**21.5**	**24.5**	**30.3**