



# MCC Mozambique Land Tenure Services Project

## EVALUATION DESIGN REPORT - ENDLINE



Mozambique Tete Chirobue  
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# MCC Mozambique Land Tenure Services Project **EVALUATION DESIGN REPORT - ENDLINE**

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## Acronyms

Acronym	Definition
APIEX	Agency for Investment and Export Promotion
CENACARTA	<i>Centro Nacional de Cartografia e Teledetecção</i>
CFJJ	<i>Centro de Formação Jurídica e Judiciária</i>
CTV	Centro Terra Viva
DID	Difference-in-differences
DINAT	National Directorate of Land
DNTF	<i>Direcção Nacional de Terras e Florestas</i>
EDR	Evaluation Design Report
EQ	Evaluation Question
ERR	Economic Rate of Return
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GoM	Government of Mozambique
ICC	Intra-Cluster Correlation
IE	Impact Evaluation
INFATEC	<i>Instituto de Formação em Administração de Terras e Cartografia</i>
INTIC	<i>Instituto Nacional das Tecnologias de Informação e Comunicação</i>
iTC	Community Land Use Fund
KII	Key Informant Interview
LIMS	Land Information Management System
LPCF	Land Policy Consultative Forum
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
MDES	Minimum Detectable Effect Size
MINAG	Mozambique Ministry of Agriculture
MSU	Michigan State University
ODK	Open Data Kit
PE	Performance Evaluation
SDAE	<i>Serviços Distritais das Atividades Económicas</i>
SI	Social Impact
SIGIT	<i>Sistema de Gestão de Informação sobre a Terra</i>
SPGC	<i>Serviços Provincias de Geografia e Cadastro</i>
TOT	Training-of-trainers
USG	United States Government

## 1. INTRODUCTION & BACKGROUND

### 1.1 Country Context

Situated on the southeastern coast of the African continent, Mozambique is a large country spanning 786,380 square kilometers. While Mozambique's population of around 24 million is still around 64% rural, it is rapidly urbanizing with an estimated average annual urbanization rate of 4.35% between 2015 and 2020.<sup>1</sup> Thanks in large part to surging coal production and the discovery of offshore natural gas reserves, Mozambique experienced unprecedented real GDP growth rates of over 7% between 2011 and 2014, tapering off to about 6.6% in 2015, 3.8% in 2016, and 3.7% in 2017.<sup>2</sup> During this period of impressive growth, the country's headcount poverty rate declined from 54.7% in 2008 to 46.1% in 2014.<sup>3</sup>

With an abundance of fertile lands, productive fisheries, and important gas and mineral deposits, Mozambique has the potential to transition from a low to middle-income economy. However, due to weak governance, a major debt crisis, recent drought, and poor service delivery, economic growth and foreign direct investment have declined, poverty remains high, and inequality, particularly among those in rural areas, is expanding.<sup>4</sup> Mozambique remains one of the poorest countries in sub-Saharan Africa, recently ranked 181 out of 188 countries on the UN's human development index (2016).<sup>5</sup>

Agriculture continues to be the mainstay of most Mozambicans, occupying around 63% of total land area and employing 74.4% of the labor force as of 2018.<sup>6</sup> Land therefore continues to be a primary asset for the livelihood security of most Mozambicans. As in other countries in the region, migration to urban areas is increasing, and in the cities, most reside in informal settlements. As such, secure access to and rights over land, water and other natural resources is essential. However, weak land governance systems have stymied resilience and contributed to insecurity and instability. Laws and policies often do not reflect best practices, agencies lack capacity to implement existing rules and regulations, and the persistent gap between *de jure* and *de facto* rights puts women and other vulnerable groups at risk. Weak land governance systems, whether in the formal or informal sectors, make it harder for smallholders to access credit and improve their productivity. Poor policies, coupled with weak enforcement, widespread corruption and an inability to address historic grievances exacerbate conflict. In urban settings, weak land governance leads to unsustainable and illegal building and drives people into underserved informal settlements, where they face greater health and safety risks and risks from natural disasters.

The 1997 Land Law, widely considered to be one of the most progressive in sub-Saharan Africa, attempts to provide security through a system that recognizes both long-term customary and good faith occupation and allows for application for a leasehold title. The right to use and benefit from land in Mozambique exists *de facto* in cases of customary or good faith occupation. Leaseholds, on the other hand, are formalized through a registered *Direito do Uso e Aproveitamento da Terra* (DUAT) certificate.

Yet, implementation of the Land Law has been slow and fraught with difficulties. Communities typically lack sufficient knowledge and resources to delimit land themselves and negotiate successfully with investors to ensure fair deals. With Mozambique becoming a target for foreign and domestic investors in

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<sup>1</sup> CIA World Factbook, 2019

<sup>2</sup> World Bank, 2019a

<sup>3</sup> World Bank, 2019b

<sup>4</sup> African Economic Outlook, 2017

<sup>5</sup> United Nations Development Programme, 2018.

<sup>6</sup> CIA World Factbook, 2019

areas such as tourism, mining, and biofuels, lands belonging to communities and families have been acquired without the requisite consultations and approvals. This has become a significant source of outcry and land conflict. Increasing competition for land and a desire to avoid costly land conflicts has spawned rising demand for certification of customary and good-faith land rights, along with demands by those seeking to acquire new land.

The process to apply for and receive a DUAT certificate remains cumbersome and prohibitively costly for many, and implementation has reportedly been uneven and often ineffective.<sup>7</sup> Many individuals either lack information about the policy and their rights or lack the resources to navigate the bureaucratic process of effecting these rights. As of 2014, only three to five percent of landholdings in Mozambique were formally registered<sup>8</sup> and it took an average of 40 calendar days to register land rights.<sup>9</sup>

Although this inefficient process has presented disincentives to private investment, it has also sometimes led to controversial large-scale land acquisitions by private investors with the means to navigate or take advantage of the system, e.g. by failing to conduct the required community consultations.<sup>10</sup> Communities typically lack sufficient knowledge and resources to delimit land themselves and negotiate successfully with investors to ensure fair deals. Given Mozambique's attractiveness for foreign and domestic investment in areas such as tourism, mining, and biofuels, lands belonging to communities and families have been acquired without the requisite consultations and approvals. This has become a significant source of outcry and land conflict. Furthermore, the ineffectiveness of the implementation of the Land Law has led in some cases to an informal market in land use rights, through which the government cannot raise revenue for crucial public services.<sup>11</sup>

## 1.2 MCC Mozambique Land Tenure Services Project

In order to address these challenges, the Millennium Challenge Corporation (MCC) disbursed over \$39m USD as part of its Land Tenure Services Project (the "Land Project") that aimed to improve land policies and regulations, improve the efficiency of land administration services, and expand access to land use particularly for individuals and communities in selected urban and rural areas. The Land Project was one of four projects initiated under a five-year Compact (2008-2013) between the Government of Mozambique (GoM) and MCC, on behalf of the United States Government (USG).

To address the complex land governance challenges facing Mozambique, the Land Project included three main activities: The Policy Activity, the Capacity Building Activity, and Site-Specific Activities in urban and rural areas. Apart from national-level activities, the Land Project focused primarily in the four northern districts of Mozambique. The main objectives of the Land Project were to:

1. Improve the efficiency of land administration through provision of systems and capacity building, thereby reducing the costs associated with acquiring and documenting land rights.
2. Increase land tenure security through issuance of certificates of land rights (DUAT certificates) and cadastral mapping, leading to: a) increased land-based investments, resulting in higher productivity, and increased incomes for rural and urban families; b) reduced conflict as a result of clear evidence

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<sup>7</sup> USAID, 2018

<sup>8</sup> Locke, 2014

<sup>9</sup> World Bank, 2019a

<sup>10</sup> Krantz, 2017

<sup>11</sup> USAID, 2018

of land rights, and c) more active land markets, generating higher land values and improved allocation of land.

### 1.3 Objectives of the Design Report

This report describes the endline evaluation design of the Land Project. This is an endline evaluation that adapts an existing evaluation design developed by Michigan State University (MSU). MSU originally designed three impact evaluations (IEs) to measure the impacts of the Land Project's Institutional Strengthening Activities and Site-Specific Activities in rural and urban hotspots. Baseline data was collected between 2010 and 2012, and the Evaluation Design Report (EDR) was revised in 2016. Social Impact (SI) has been contracted by MCC to conduct the endline evaluation and answer evaluation questions about the Land Project's outputs, impacts, and sustainability.

This document is divided into three sections. The first section presents an overview of Land Project the interventions evaluated. The second section provides the theory of change linking Land Project activities to outcomes and impacts of interest, as well as a brief overview of the relevant literature and empirical evidence on land tenure programming. The third section details the endline evaluation design for the three planned evaluations. This section outlines the evaluation questions, data sources and analysis plan, as well as proposed revisions to the Economic Rate of Return and study risks. The final section includes administrative information about the endline evaluation timeline, roles, ethical clearance, and reporting and dissemination.

## 2. MCC LAND TENURE SERVICES PROJECT

### 2.1 Overview of Interventions

The Land Project consisted of three overall components: (1) monitoring policy and implementation and encouraging improvements (Policy Activity); (2) capacity building and upgrading of public land administration agencies at provincial, district and municipal levels (Capacity Building Activity); and (3) facilitating site specific land access through granting of land use certificates (DUAT certificates) to property in select rural and urban hotspots (Site-Specific Activity).<sup>12</sup> The policy activity was implemented at the national level, while the capacity building and site-specific activities focused on four northern provinces of Mozambique – Nampula, Zambezia, Cabo Delgado, and Niassa. Within these four provinces, district-level capacity building took place in 12 districts and municipal-level interventions focused on ten municipalities. Originally the Land Project targeted eight municipalities. However, the municipalities of Metangula near Lake Niassa and Montepuez in Cabo Delgado were eventually added to the list of municipalities where land regularization occurred. This was done due to demand for regularization within Metangula and Montepuez combined with the fact that these municipalities are small, and the completion of a full cadaster was feasible to ensure accurate and reliable records. The geographic scope of the Land Project and criteria for site selection are described in more detail below, in Section 2.1.1. Under the three overall components noted above, the project included several sub-activities, as follows:

#### Component 1: Policy Activity – National level

- Development of a national land administration regulatory framework and needs assessment
- Formation of Land Policy Consultative Forum (LPCF) to provide technical and logistical support to monitor progress on land legislation reform and implementation
- A campaign of public education, outreach and increasing awareness of non-judicial dispute resolution methods and expansion of a program on legal and judicial training to paralegals
- Advisory services to the *Direcção Nacional de Terras e Florestas* (DNTEF), the National Directorate of Land and Forests (which is now known as the National Directorate of Land, or DINAT)

#### Component 2: Capacity Building Activity

- Development and installation of the Land Information Management System (LIMS), later renamed *Sistema de Gestão de Informação sobre a Terra* (SIGIT)<sup>13</sup>: final design and development of a national SIGIT strategic plan,<sup>14</sup> and installation at multiple provincial offices. This was later expanded to all provincial land offices (i.e. nationally). SIGIT was also installed in the ten target municipalities.

<sup>12</sup> The Land Project also provided support to the Community Land Use Fund (iTC) to support communities and associations in delimiting and demarcating of their boundaries in an effort to secure their land rights, ensure their access to natural resources and increase investment and links with financing opportunities. Established by a consortium of six international donors and implemented in Inhambane, Cabo Delgado, and Manica provinces, in 2009 the Land Project expanded the iTC to an additional three northern provinces (Zambezia, Nampula and Niassa). The initiative likewise supported communities with registration, negotiations with investors, and resource planning. This sub-component was the subject of a separate evaluation by DFID that assessed outcomes associated with the full geographical implementation of the Community Land Use Fund.

<sup>13</sup> For consistency, we will refer to the LIMS/SIGIT system in the remainder of this document as “SIGIT”, though it was originally called “LIMS” during the Compact.

<sup>14</sup> The national SIGIT strategic plan was initially funded by the Italian Government.

- Professional development and training: Implementation of a comprehensive approach to professional development and training (e.g., local requirements and international best practices in cadastral and registration information systems, surveying and titling procedures, land law) at the national level, and each of the provincial, district, and municipal land offices targeted by the project, thereby increasing knowledge and awareness of land tenure issues, land records management, surveying techniques, and trends in land policy and services.
- Technical Assistance for cadastral development, including mapping and rights inventory exercise (all 12 selected districts and 9 municipalities): Investment in and technical assistance for cadastral development in select municipalities, including cadastral registration within each targeted municipality. Although originally planned to be a pilot effort in select municipal neighborhoods, following the needs assessment, the Project worked across all nine targeted municipalities.<sup>15</sup>
- Upgrading of physical land office facilities: Investment in and technical assistance for the upgrading of physical facilities for the national level and each of the provincial, district, and municipal land offices targeted by the Project.

### Component 3: Site-Specific Activity

- Area-wide registration of land rights: piloted in district and municipal hotspot areas characterized as more dynamic and/or conflictive. During implementation, the Project targeted 140 thousand DUAT certificates to be issued in selected hotspot municipalities and over 20 thousand DUAT certificates in selected hotspot rural districts.
- Knowledge and awareness raising: Streamlining investor and farmer access to land by making available simple informational tools and guidelines (focused on district and municipal hotspot areas), such as legal information, guidelines regarding the requirements for negotiating land access with local communities, printed site maps showing land use and existing titles, etc.

#### 2.1.1 Geographic coverage

In the four Northern Mozambique provinces of Nampula, Cabo Delgado, Niassa, and Zambezia, the Land Project targeted ten municipalities and 12 districts (Figure 1). The 12 targeted districts include Nicoadala, Morrumbala, Mocuba, Malema, Monapo, Moma, Moçimboa da Praia, Montepuez, Mecufi, Majune, Lichinga, and Metangula.<sup>16</sup> The ten municipalities include Quelimane, Mocuba, Monapo vila, Nampula city, Pemba, Moçimboa da Praia vila, Lichinga, Metangula, Montepuez and Cuamba.

The targeted districts were selected by the project implementation team in coordination with GoM stakeholders on the basis of six criteria: (i) high demand for DUAT certificates, (ii) government priority areas, (iii) sufficient local technical capacity, (iv) financial and human resources available for the project, (v) existence of land use plans, and (vi) at high risk of land conflicts. A list of all the districts and municipalities, as well as the selection criteria they met for Land Project activities is given in Table 1 below.<sup>17</sup>

<sup>15</sup> Note that the mapping and rights inventory was originally designated as a Site-Specific Activity but because it focused on district and municipal capacity building for land-use planning and cadaster maintenance, the endline evaluation categorizes this intervention under component 2 (Capacity Building).

<sup>16</sup> The SI evaluation team uses MCC and MSU's naming convention in referring to this as Metangula district rather though external resources note this as Lago district.

<sup>17</sup> The source of this table is: Jin, et al., 2016b

The Capacity Building Activity, as well as the mapping and rights inventory exercise of the Site-Specific Activity, was implemented across all targeted districts and municipalities. The area-wide registration of land rights and awareness-raising sub-activities of the Site-Specific Activity were implemented in prioritized hotspot areas within Nampula city and Monapo vila municipalities and within Malema and Mecufi districts.

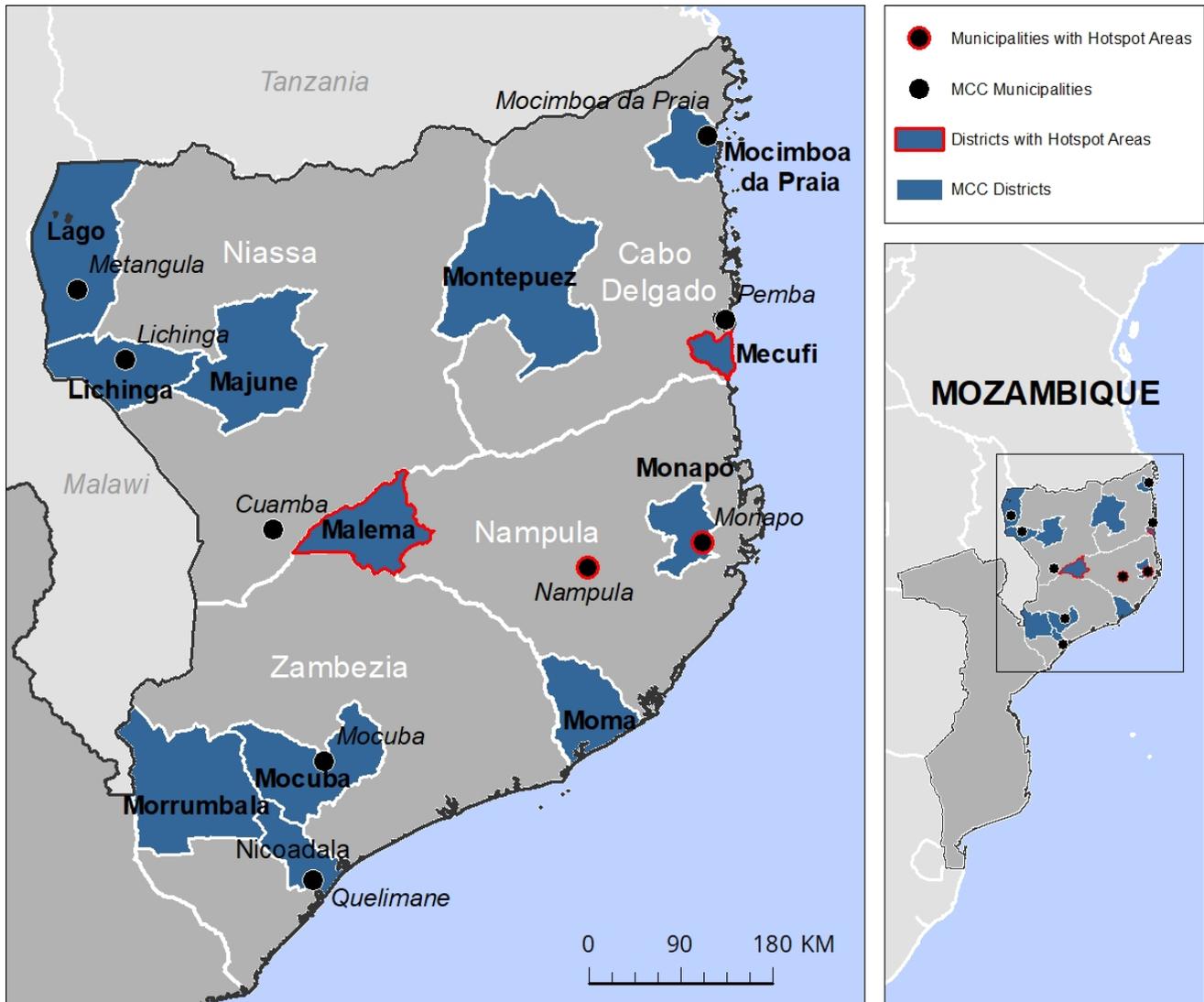


Figure 1. Map of provinces, districts, and municipalities targeted by the Land Project<sup>18</sup>

<sup>18</sup> Lago district, as mapped, is referred to as Metangula district within this report to remain consistent with MSU and MCC's conventions

**Table 1. Selection Criteria for Targeted Municipalities and Districts**

	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6
<b>MUNICIPALITIES</b>						
<b>Zambézia Province</b>						
Quelimane		•	•			•
Mocuba		•	•		•	•
<b>Nampula Province</b>						
Monapo vila	•	•	•		•	•
Nampula	•		•		•	•
<b>Cabo Delgado Province</b>						
Pemba	•	•			•	•
Moçimboa da Praia vila	•	•				•
<b>Niassa Province</b>						
Lichinga	•	•	•			•
Cuamba	•	•	•			•
Metangula	•	•				•
<b>DISTRICTS</b>						
<b>Zambézia Province</b>						
Nicoadala	•	•				•
Morrumbala	•	•	•			•
Mocuba	•	•	•			•
<b>Nampula Province</b>						
Malema	•	•	•			•
Monapo	•	•	•			•
Moma	•	•				•
<b>Cabo Delgado Province</b>						
Moçimboa da Praia	•	•		•	•	•
Montepuez	•	•		•	•	•
Mecufi	•	•		•		•
<b>Niassa Province</b>						
Majune	•	•				•
Lichinga	•	•				•
Metangula	•	•				•

Key for Criteria: 1 = High Demand for DUAT certificates; 2 = Government Priority; 3 = Local Technical Capacity Exists; 4 = Support from Other Sources (Financial and Human); 5 = Land Use Plans Exist; 6 = High Risk of Land Conflicts

## 2.1.2 Program participants and beneficiaries

The Land Project was implemented by the Millennium Challenge Account (MCA)-Mozambique, utilizing 28 implementing entities (project contractors and Mozambican state institutions), which were key counterparts in project implementation. The Mozambican state and municipal implementing institutions were also the primary recipients of the support provided by the Land Project.

### 2.1.2.1 Implementing contractors

The prime contractor was HTSPE, Ltd, a firm formally based in the United Kingdom experienced in the implementation of development assistance projects, including ones focused on the reform of land administration systems. HTSPE closely partnered with Verde Azul, a Mozambican organization dedicated to the resolution of complex social and environmental challenges and promotion of sustainable land tenure and land use. Verde Azul served as the lead national contractor responsible for most personnel and several subcontracts. MCA also engaged the Legal and Judicial Training Center (*Centro de Formação Jurídica e Judiciária*, or CFJJ) to provide paralegal training, public education and awareness campaigns. Other consortium service providers included Matrix Development (cadastral expert for the needs assessment phase of the project), LexTerra Lda. (providing key policy advice and analysis), EXI (software development company selected to design and implement SIGIT) and ESRI-Portugal (contributed to the GIS portion of SIGIT).

### 2.1.2.2 Public institution partners

- *Direcção Nacional de Terras e Florestas (DNTF)* - National Directorate of Land and Forests. Support by the Land Project included development and installation of a land information and management system that would be the foundation of the current SIGIT; connection of the SIGIT to *Serviços Províncias de Geografia e Cadastro* (SPGCs), training and professional development of technical staff; simplification and improvement of land administration procedures; provision of background papers and policy briefs to the Land Consultative Forum; ongoing technical support and advice.
- *Centro Nacional de Cartografia e Teledetecção (CENACARTA)* - Mapping and Remote Sensing Agency. Support from the Land Project consisted of funding for the purchase and processing of the satellite imagery used by the project and for field equipment intended to be used for collecting ground control points for precision geometric correction of the imagery. Survey equipment was also purchased.
- *Instituto de Formação em Administração de Terras e Cartografia (INFATEC)* - Training Institute for Land Administration and Mapping. Support to INFATEC included: drafting, review and accreditation of an education curriculum; training of instructors and administrative staff to implement the new curriculum; materials to support training; and rehabilitation of infrastructure.
- *Instituto Nacional das Tecnologias de Informação e Comunicação (INTIC)* - National Institute of Information and Communication Technologies. Supported communications infrastructure associated with the SIGIT, including data recovery and back-ups.
- *Serviços Províncias de Geografia e Cadastro (SPGC)* - Provincial Services for Geography and Cadaster. Support in the four northern provinces included: installation and training for SIGIT, extended to all 10 SPGCs in the country; professional development and staff training; physical facility upgrading; provision of office and field equipment and computer hardware and software.

- *Servicos Distritais das Atividades Economicas (SDAE)* – District Service of Economic Activities. For the 12 targeted districts of the four northern provinces, support included: professional development and staff training; physical facility upgrading; provision of office and field equipment and computer hardware and software; mapping and inventory of land uses in the district; provision of information and education materials to support community-investor partnerships in hotspot areas; and piloting an approach for systematic registration of grants of land use in hotspot areas.
- Municipal cadaster and land registration authorities in nine municipalities of four northern provinces. Support consisted of installation and training for SIGIT; professional development and staff training; physical facility upgrading; provision of office and field equipment and computer hardware and software; technical assistance for cadastral development; mapping and inventory of land uses in the municipality; provision of information and education materials to support community-investor partnerships in hotspot areas; and piloting an approach for systematic registration of grants of land use in hotspot areas.

### 2.1.2.3 Beneficiaries

Mozambique citizens were expected to benefit from the project in terms of increased access to land registration and protection. While this can be broadly applied nationwide to anyone who had or acquired land-use rights under the Policy and Capacity Building Activities, the program specifically targeted individuals and communities in the four selected Northern Provinces. Anticipating time and cost savings due to the project, MCC estimated that individual beneficiaries would include nearly 600 thousand urban parcel holders and over 520 thousand rural smallholders.<sup>19</sup>

## 2.2 Activities to be Evaluated

The endline evaluation is tasked with providing a comprehensive evaluation of the Land Project,<sup>20</sup> and the proposed evaluation design puts forward three separate evaluations including an Institutional Strengthening Evaluation, a Rural Site-Specific Evaluation, and an Urban Site-Specific Evaluation. Each of these will include performance and impact evaluation components.

For the Institutional Strengthening Evaluation, SI will evaluate project activities focused on the *land administration system and institutions*. Thus, the performance evaluation (PE) component will cover all project activities at the national, provincial, district and municipal levels for the Policy Activity and Capacity Building Activity, as described above in Section 2.1. The impact evaluation component will evaluate interventions under the Capacity Building Activity that were implemented at the district and municipal levels. In municipalities, the interventions of interest include installation of SIGIT, upgrading of equipment and facilities and professional and development training provided to local land administration staff. In districts, the impact evaluation will only investigate treatment effects related to upgrading facilities and professional training for land administration staff, since SIGIT was implemented across all SPGCs, resulting in no valid control districts for the SIGIT component.

For the Rural and Urban Site-Specific Evaluations, SI will evaluate project activities focused on *landholders*. Both the performance and impact evaluation components cover interventions under the Site-Specific Activity that relate to knowledge and awareness-raising and piloting a sound approach to area-

<sup>19</sup>Millennium Challenge Corporation, 2007; Millennium Challenge Corporation, 2013

<sup>20</sup> However, evaluation of the Community Land Use Fund will be excluded both from impact and performance evaluations because a prior evaluation was already carried out and MCC does not consider further evaluation to be necessary.

wide registration of land rights. The relevant geographic levels include hotspot areas within Nampula city and Monapo vila municipalities and within Malema and Mecufi districts.

### 2.2.1 Implementation Fidelity

Several implementation issues affect the validity of the original evaluation design and will be analyzed as part of the endline performance evaluations. We briefly summarize these issues here and discuss them in more detail in later sections, within the detailed discussion of the proposed evaluation design.

First, little progress was made on the Policy Activity beyond completion of the needs assessment and land policy consultative forum. The original impact evaluations were designed to be re-administered after the passage of the legal amendment granting transferability of rural estates in land. However, to-date this legal amendment has not passed.

Second, there were significant delays (2-3 years) in the start date for the Capacity Building and Site-Specific Activity implementation. The development, installation and training associated with SIGIT was significantly delayed and may have contributed to variation in SIGIT functioning across the municipalities. The endline evaluation will explore factors related to the protracted implementation of SIGIT and implications for impact and sustainability.

Third, there were changes in the designated treatment and control units across three of the four hotspot sites locations.<sup>21</sup> In Nampula city, the actual implementation deviated from the original plan in two critical ways. The original hotspot evaluation design called for a treatment set of four bairros (Muatala, Namutequeliua, Muhala-Sede, and Mutaunha) matched to a single control bairro (Muahivire).<sup>22</sup> The actual implementation shows that the program was implemented in the control bairro and only across three of the original four designated treatment bairros. Next, due to the slow pace of program implementation, by the end of the Compact, only 295 households out of the 560 households that were intended to be treated ultimately received treatment. This deviation reduces the power of the study.

In Monapo vila, there was strong uptake of project formalization activities, and a decision during the Compact to allow Monapo vila to complete its full land cadaster, eliminating the original control areas as part of the urban site-specific evaluation in that area. In the Mecufi district hotspot, designated treatment units became control units and vice versa.<sup>23</sup> The implications of each of these is discussed in more detail as part of the proposed evaluation design in later sections.

## 2.3 Project Logic & Key Indicators

The Land Project is based on the fundamental assumption that formal registration of land use rights (i.e., land titles to long-term or perpetual-use rights) to individual households serves to strengthen property rights. Assuming that one has secure tenure/property rights, MCC anticipated that the successful

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<sup>21</sup> In the Nampula city hotspot, within the three priority bairros (Muhala-Sede, Muahivire and Namutequeliua), the intervention was implemented within twelve sub-communities, known as the *Unidade Comunal* (UC). The control areas include seven UC within these bairros where the program was not implemented, as well as ten UCs in two separate bairros (Muatala and Mutaunha).

<sup>22</sup> The treatment set was selected and prioritized by the municipalities based on some set criteria and were outside the control/influence of the MSU evaluation team. The control *bairros* were selected by MSU on the basis of population size (individual and household), percent of HHs with farm income, percent of HHs with female head and percent of HHs with TV.

<sup>23</sup> Specifically, the definition of control and treatment areas was changed post-survey. Originally, the implementation plan was to intervene on the coastal side of all the seven *aldeias* and leave the non-coastal side of each of the *aldeias* untreated. However, after the baseline survey was completed, the intervention plan changed to complete treatment coverage of some villages (Maueia, Muitua and Ngoma) and leaving others (Secura A, Secura B, Zaulane A, and Zaulane B) as control due to the strong objection from its members on the original intervention plan.

implementation of the Land Project activities and sub-activities would improve the efficiency of land use, increase investment and productivity, and develop land markets, which would ultimately lead to increased land values and higher incomes for property owners.

MCC also anticipated that improvements in land administration services - when combined with clear land use rights - would improve conflict resolution over land disputes, thereby contributing to a more favorable environment for investment and business development.<sup>24</sup> The short-term expected outcomes of the Land Project activities focused on institutional strengthening include reduced time and costs associated with registering and transacting in land. Through these actions, the Project was designed to strengthen institutions by improving the timeliness of service and accuracy of land information, as well as reducing the costs associated with transacting and registering land rights. With stronger land institutions, citizens would benefit from increased security and capitalization of land and real property assets through increased investment in land and property. Over time, as land and financial markets developed, MCC further expected that formal land rights could be used as collateral for loans, expanding access to credit.<sup>25</sup>

Figure 2 below depicts a general Land Tenure and Governance Theory of Change, which broadly informs the endline evaluation. This logic model is global and not specific to Mozambique but rather provides an overview of the range of land theory of change dimensions that may be present in a given country or given project. Sustainable resource management/environmental degradation is the only outcome area that is not a focus of our endline study.

In addition to this overarching theory of change, we detail the specific project logic and theory of change for the endline study in Figure 3.

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<sup>24</sup> Millennium Challenge Corporation 2007; Millennium Challenge Corporation, 2013

<sup>25</sup> Millennium Challenge Corporation, 2013

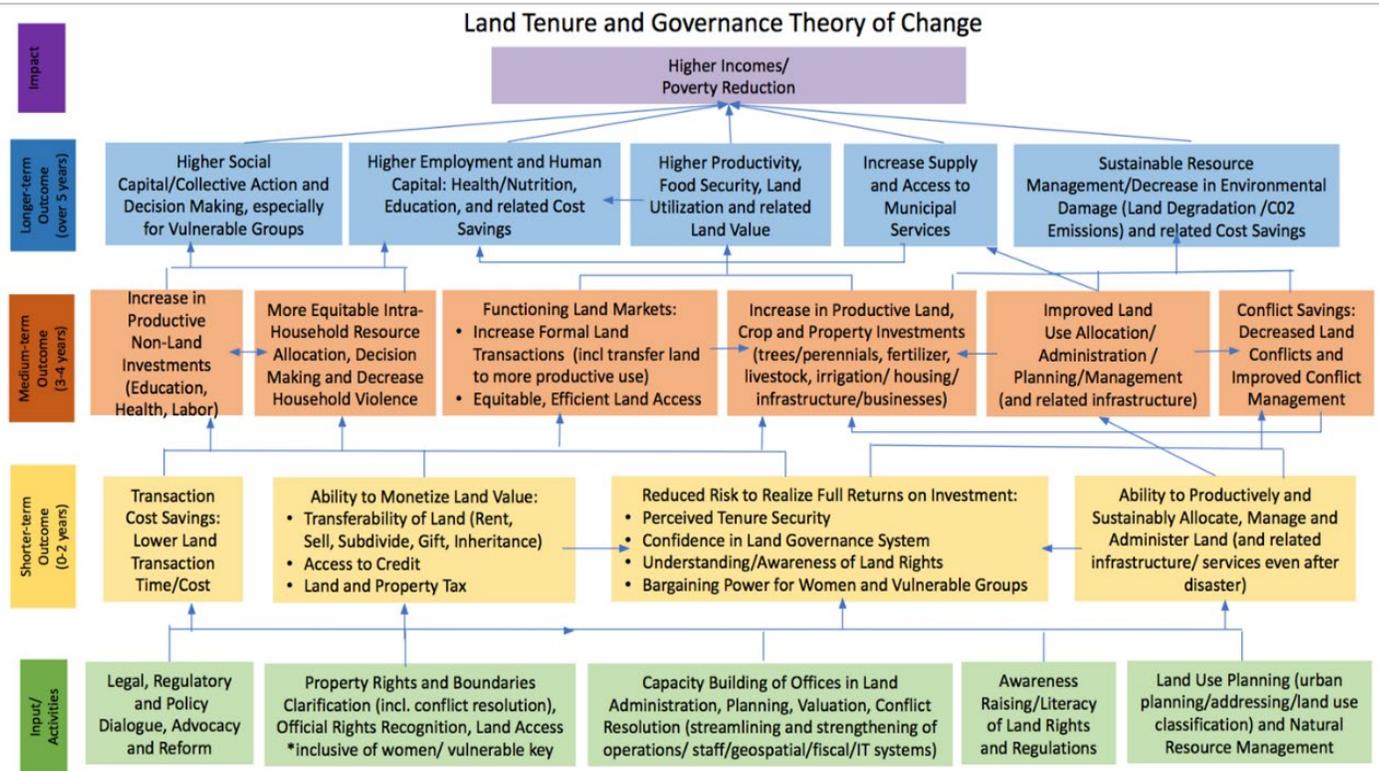


Figure 2. Overall Land Tenure and Governance Theory of Change <sup>26</sup>

## 2.4 Economic Rate of Return and Beneficiary Analysis

The expected Economic Rate of Return (ERR) for the Land Project is 24.8%. At the end of the Compact, MCC substantially revised the ERR analysis for the project from the original analysis completed during the Due Diligence period. While the policy reform and capacity building components of the Land Project are intended to improve the efficiency and transparency of land titling and land transfers nationwide, the revised ERR analysis is based on a consolidated model that only measures income gains for direct/targeted beneficiaries.

The ERR analysis estimates benefits from two income streams: (i) implicit income gains to households receiving DUAT certificates (for land in urban and rural hotspots) measured as increases in Gross Domestic Product (GDP), and (ii) increased income from investments in agricultural lands for members of communities whose lands are delimited and from investments in production for producer associations whose land are demarcated. Given the paucity of quantitative evidence for estimating direct effects, the revised ERR model is based on conservative and unverified base-case assumptions. The revised ERR benefit streams are based upon empirical studies for Mozambique or other African countries, as well as implementer data from the Land Project. Benefits are included for communities and associations, as well as for urban and rural parcel-holders that are expected to receive a DUAT certificate under the program.

<sup>26</sup> The source of this graphic is: Lisher, 2018.

### Mozambique Land Tenure Services Project Logic

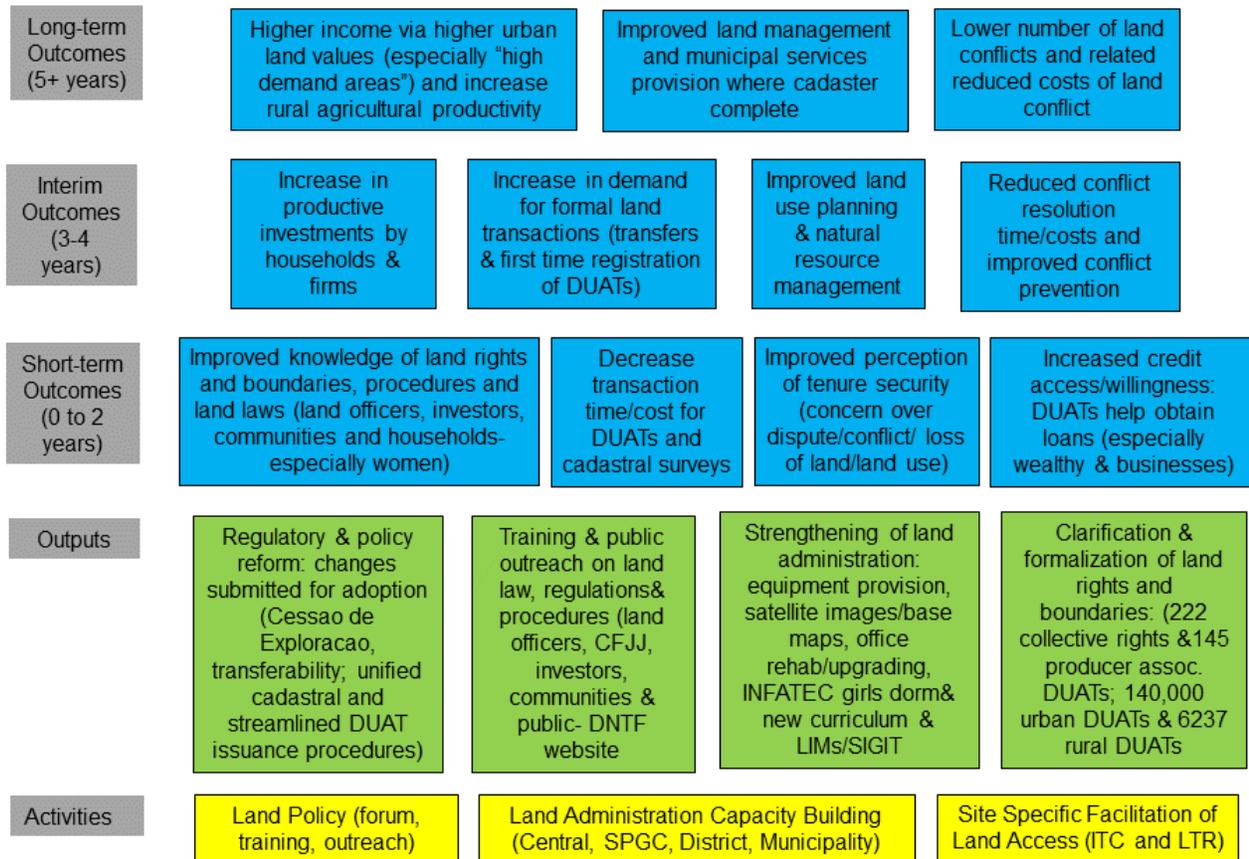


Figure 3. Detailed Project Logic for MCC Mozambique Land Tenure Services Project

## 2.5 Literature Review

### 2.5.1 Summary of existing evidence

Scholarship from a wide variety of disciplines has emphasized the crucial role that property rights plays in sustainable economic development. Several theories link improved property rights to key factors that contribute to economic growth, including investment, productivity and social stability. An exhaustive literature review and discussion of the theoretical mechanisms is beyond the scope of this design report. However, as described below, several primary hypotheses have motivated interventions to strengthen tenure security, including through titling and formalization efforts in developing countries.

One key hypothesis is that insecure tenure deters investment. Several studies have made the formal argument for why tenure insecurity might deter investment (e.g. Besley, 1995; Goldstein and Udry, 2008; Besley and Ghatak, 2010). Investment, they argue, has an unconditional cost but pays a return only if the investment is not appropriated. By reducing appropriation risk, the theory goes, property rights raise the expected return to investment, which encourages more investment. This prediction assumes

households do not face other constraints to invest, such as the lack of needed resources or knowledge (Besley and Ghatak, 2010).

Several cross-country studies have claimed that appropriation risk is a bigger barrier to investment than other market imperfections (Acemoglu and Johnson, 2005; Johnson et al., 2002). But the case for a link between aggregate insecurity and the individual's decision to invest has rested on household-level studies of the security of land tenure. Since land is often central to a household's livelihood, especially in rural contexts, this literature has argued that insecure tenure distorts a wide range of household decisions.

Moreover, some studies have adapted the model to describe tenure impacts on labor allocation or migration (e.g. Field, 2007; Valsecchi, 2014; De Janvry et al., 2015). If labor can be used either to generate income or to guard an untitled plot of land (by staying at home for example), granting tenure security would free up labor for market work or migration. Farming a depleted plot of land—one in need of fallowing—can also be a way to safeguard against land appropriation by proving its active use. Granting secure tenure, as per the theory, would let the household leave depleted land fallow and either use labor on more fertile plots, hire their labor out to other farmers, or migrate in search of work. As such, Besley (1995), Field (2007), Goldstein and Udry (2008), De Janvry et al. (2015), and many others have argued that granting a household tenure over its land triggers responses ranging from agricultural investment to international migration.

A second important hypothesis is that tenure insecurity decreases lenders' willingness to supply credit (Feder and Feeney 1991). Households without formal property rights or documentation to prove ownership may be unable to access the formal credit market. In contrast, individuals with formal property rights and documentation may find it easier to use their property as collateral to secure loans and credit and thereby increase investment (Binswanger et al. 1999; Holden 1997).

Third, secure property rights can make it easier for individuals to buy and sell their rights to land and property. Functioning and efficient land sale, rental, and real estate markets are therefore expected to support the use of land as collateral, facilitate efficient allocation of land to the most productive user, and encourage more efficient allocation of land and property across individuals (Feder, et al. 1988). They represent an important means for smallholder farmers to obtain sufficient farm size to shift from subsistence to cash crop production, or conversely, for nonagricultural households to rent out land as an important part of their asset and investment strategy (Higgins, et al 2017).

Finally, secure property rights and asset ownership are associated with an equity and empowerment effect, especially for women. Various studies have argued that reducing gender gaps in access to productive assets (i.e., allowing women to own and control land) is key to women's empowerment (Kumar & Quisumbing, 2015). Furthermore, multiple studies have tied women's land rights to development efficiency (Agarwal, 1994; Doss, 2011). Land rights for women are claimed to promote broader community welfare because women use resources and make decisions to benefit children and others (Kumar, 1978; Quisumbing & de la Briere, 2000). Specifically, for household outcomes, women's empowerment is associated with a variety of outcomes, including better health care, increased contraceptive use, improved household consumption, better child immunization, nutrition, and reduced child mortality (e.g. Bloom et al., 2001; Datta, 2006; Govindasamy & Malhotra, 1996; Fafchamps & Quisumbing, 2002; Gage, 1995; Kishor, 2000).

However, the linkage between property rights, access to credit and increased investments, as well as gender difference of these factors have yet to be well-established empirically. Across rural and urban contexts, evidence on the effect of land administration interventions, especially those related to titling, is remarkably mixed for several outcomes (Feder and Nishio 1999, Gignoux 2015, Payne 2008).

Several prominent studies have found tenure impacts on increased soil conservation investments in Rwanda (Ali et al. 2014) and tree investments in Ethiopia (Holden et al. 2009; Melesse and Bulte, 2015), as well as for investment in perennial cash crops and trees and increased following by female-headed households in Benin (Goldstein et al. 2015). A study on land titles in Peru found national titling program had significant impact on the rate of residential investment in urban slums and likelihood of market work (Field 2007). The study also found that a title was positively associated with approval for public sector loans though it showed no association with approval for private banks (Field and Torreo 2006). Valsecchi (2014) and De Janvry et al. (2015) find impact on the likelihood of having a household member migrate.

However, much of the impact evaluation literature is observational versus experimental, and in Africa, it is primarily drawn from two country contexts, Ethiopia and Rwanda. Non-impact evaluations from the rest of Africa show mixed empirical results and new experimental evidence testing the effects of tenure security on investment finds null results (Huntington and Shenoy 2019). Overall, the body of literature remains inconclusive on the impact of tenure security on investment and productivity (Lawry et al. 2014; Payne 2008; Place 2009).

Despite the general consensus that women's land rights promote development by empowering women and increasing productivity and welfare, there is a paucity of rigorous empirical analysis explicitly linking women's land rights to empowerment indicators (Allendorf, 2007; Meinzen-Dick et al., 2017). This is due, in part, to a lack of gender-focused data-generating and monitoring efforts, along with a dearth of dedicated evaluation and research to investigate the gender effects of development interventions (e.g. Ahikire & Kassim, 2012; Byron & Örnemark, 2010; Gosparini et al., 2006; Meinzen-Dick et al., 2017). In cases where women's land use rights were not taken into consideration in intervention design and implementation, there is evidence suggesting that individual land titling may have had negative impacts (Meinzen-Dick and Mwangi 2009).

Empirical support for a robust and positive link between stronger tenure security and household obtainment of credit or engagement in land rental markets has also been mixed or tenuous (Higgins, et al 2017; Lawry et al. 2014). A recent systematic review conducted by the International Fund for Agricultural Development (IFAD) of rigorous empirical research on the effects of formal titling found that of the six qualifying studies that attempt to measure this outcome, two found a positive effect of the titling intervention on credit access and four found no effect. They note that analysis of credit outcomes often lacks discussion of whether credit was constrained by land versus other environmental factors unrelated to tenure security that often restrict household ability to access credit or engage in land rental activity.

The evidence on the impact of different land interventions on land rental markets is somewhat mixed. The IFAD systematic review found mixed evidence on the effect of titling on rental market participation, as two studies found a positive effect and one found no effect. Several studies have suggested that conventional assumptions regarding the tenure security and credit/rental market link may not hold in all contexts, such as in strong customary or communal land settings and statutory contexts where land is not collateralizable and that characterize much of sub-Saharan Africa (Lawry, et al 2014). Certification

MCC Mozambique Land Tenure Services Project – Endline EDR was found to increase land rental market activity in Ethiopia, including for women (Holden et al. 2009, 2011; Holden and Ghebru 2013; Deininger et al. 2011), as well as in Zambia, although through a customary land certification program (Huntington et al. 2019).

Overall, there are large and important gaps in the empirical literature. Current scholarship suggests cautious support for a potential incentivizing role of stronger tenure security in promoting investments and economic growth. However, given mixed results, a small number of experimental designs, and the limited geographic scope of rigorous impact evaluations, there is a clear need for additional systematic empirical work.

### 2.5.2 Policy relevance of the evaluation

With a view to the evidence gaps raised above, the evaluation will contribute to the wider body of evidence on the extent to which documentation and registration of land rights in rural and urban Mozambique contributes to increased tenure security and reduced land conflict, increased land productivity and household incomes, more dynamic land markets that result in access to credit and productivity-enhancing land allocation, increased public revenues from land taxation and fees, and improved welfare for rural and urban families. Evaluation findings can be used to inform land policy and future investments in land administration systems in Mozambique and beyond.

Significantly, the endline evaluation will also help MCC and the Government of Mozambique understand whether improved information systems, capacity building and equipment are effective in improving the efficiency of land administration and reducing the costs borne by both government and landholders of documenting land rights. Particularly, it sheds light on whether the type of information system provided through the program was “fit-for-purpose” in view of institutional capacity, resources, and information technology and communications infrastructure, both at the time of project implementation and now.

## 3. EVALUATION DESIGN

### 3.1 Evaluation Questions

Overall, the endline evaluation aims to validate the program logic underlying each activity and assess the sustainability of proposed and achieved outcomes after project close. Twelve evaluation questions (EQs) motivate this endline evaluation of the Land Project:

1. Were project outputs sustained, particularly SIGIT and continued issuance of DUAT certificates post-compact, including those in *diferido*<sup>27</sup> status?
2. Has the Land Project changed the efficiency of land administration, particularly changes in time, cost, and number of steps to conduct to process/acquire a DUAT certificate or conduct a secondary land transaction?
3. Did the Land Project improve access to land and land markets, including changes in demand and approvals for DUAT certificates and other secondary land transactions? Was there a related change in awareness or confidence in the land governance system? What are the characteristics of those applying for DUAT certificates and conducting land transactions?

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<sup>27</sup> This refers to parcels that were mapped by the Land Project but did not receive a DUAT certificate and were awaiting for resolution of conflict or were in restricted areas or other circumstances that would not allow the government to approve a DUAT certificate.

4. Did those parcels which received DUAT certificates remain in the statutory system or were parcels transferred informally during the post-compact period?
5. What was the effect of the Land Project on incidence of conflict?
6. Has the Land Project resulted in improved access to formal credit?
7. Did receipt of a DUAT certificate lead to changes in perceptions of tenure security or *de facto* land tenure?
8. For households which received a DUAT certificate, what was the impact on land investment and utilization, including transfer and renting of land? If there were changes in investment or utilization of land, what was the effect on land values?
9. Did effects differ by district/municipality, parcel size, land use or gender? For gender, were effects dependent on whose name was included on the DUAT certificate?
10. Did those areas which received DUAT certificates lead to demand for DUATs in neighboring areas or for demand for DUAT certificates for additional parcels held by the beneficiary households?
11. Where the success of project outputs (such as a complete cadaster and a SIGIT system still fully functioning post-compact) had the potential to change how municipalities provided services and related tasks, does the evaluation find evidence of improvements in municipal planning, land tax administration, and supply and access to public services? <sup>28</sup>
12. Was the process of commercial investment (in rural land) - when it took place in areas where DUAT certificates had been issued by the project - expedited by the provision of DUAT certificates with defined boundaries of land parcels to land holders? Does the availability of cadastral index maps with the list of DUAT certificate holders help the government to direct investors to available land and help investors conclude investment agreements to access land? Did a DUAT certificate, where held, aid DUAT certificate holders to engage with government or investors related to potential investments?

In addition to answering each of these evaluation questions through the endline evaluation, SI will produce a revised calculation of the ERR of the Land Project. Further, SI incorporates as part of the design ways to measure outcomes related to productivity and incomes/livelihood improvements aligned with the theory of change (e.g., increased land tenure security is hypothesized to result in higher productivity, and increased incomes for rural and urban families).

### 3.2 Overview of Evaluation Design

To comprehensively address all evaluation questions, we propose three separate evaluations: (1) Institutional Strengthening, (2) Rural Site-Specific, and (3) Urban Site-Specific. Each of these will include impact and performance evaluation components.<sup>29</sup> Each evaluation will include causal impact analysis for indicators that can be addressed in a rigorous manner and will assess performance indicators and

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<sup>28</sup> Note that these outcomes represent secondary or unintended positive externalities from the Land Project that were flagged by stakeholders as potential results. As the Land Project did not focus on municipal service provision and taxation, the evaluation will treat these as incidental program effects and not primary program objectives. The evaluation will focus on examining these outcomes in municipal areas where project outputs, such as a complete cadaster and functioning SIGIT system, support the presence of these effects.

<sup>29</sup> In general, this approach is in line with the previous evaluation led by MSU; however, that evaluation focused only on impact evaluation methodology, and our proposed methodology answers a wider set of evaluation questions, necessitating both performance and impact methodologies, along with a wider set of data sources and a mixed-methods approach.

outcomes through a mixed-methods approach that triangulates findings from multiple quantitative and qualitative sources. To ground and explain both the impact and performance findings, each evaluation will collect relevant data on contextual factors and mechanisms linking the Land Project interventions to the expected outcomes of interest.

Overall, our evaluation design utilizes the following **quantitative** data sources:

- Panel household surveys
- Wives survey
- Community leader survey
- Land administrative data
- Satellite imagery and geospatial data
- Direct observation of land offices and equipment
- Other government/administrative data (where available) (i.e. banks, municipal planning and taxation, census data)
- Secondary data and annual/quarterly reports from contractors

We also propose the following **qualitative** data sources:

- Focus group discussions (FGD) with household-level beneficiaries,
- Structured key informant interviews with land administrative unit officials,
- Open-ended key informant interviews with other relevant stakeholders, including Directors of Municipal and District Land Offices, Mayors/President of the Municipality, Head of the SDAE, Investors, as well as loan officers from banks/MFI, representatives of the Registo Predial, and notaries.

We provide a crosswalk of MCC's Evaluation Questions and data collection approaches in Figure 4 below. The specific indicators that will be measured under each evaluation question are elaborated in each of the detailed design sections that follow. Further, a more detailed crosswalk broken down into additional detail including evaluation question, outcome, and design component, is provided as a separate attachment to this report.

To analyze project *impacts* we propose continuing the original quasi-experimental difference-in-differences (DID) design with matching. Under a quasi-experimental approach, program impacts are determined by drawing on outcome information across beneficiaries who received the program intervention, or treatment, and the same set of outcome information collected from a group of comparable units that did not receive the treatment. The control group serves as a counterfactual for the treatment group, essentially providing information on what *would have happened* to the treatment group, had they *not* received the program intervention. For the analyses to be credible and robust, the control group should be as similar as possible to the treatment group across important characteristics that also shape the outcomes of interest.

In alignment with the original design, the primary data sources that will be used for the impact evaluation approach include land administrative data for the Institutional Strengthening Evaluation, and household surveys for the Urban and Rural Site-Specific Evaluations. Depending on data availability and quality, we

also intend to use the satellite imagery to measure investment and land change as impact measures for the Rural and Urban Site-Specific Evaluations.<sup>30</sup>

The performance evaluation approach will involve analysis of outcomes related to MCC's evaluation questions that are not conducive to an impact evaluation design, using a mixed methods approach that triangulates findings from the multiple quantitative and qualitative sources listed above. This approach is defined by a strong focus on assessing program effectiveness across a comprehensive theory of change, investigating differential impacts by gender, geography and household characteristics and grounding the findings with contextual data. The descriptive, qualitative and secondary analysis of program performance indicators and outcomes will allow us to assess project sustainability, provide nuanced answers to MCC's evaluation questions and describe how and why impact results are occurring.

In the Sections below, we provide a detailed discussion of the methodology and design, including evaluation questions and data sources, for each of the three evaluations: Institutional Strengthening, Urban Site-Specific and Rural Site-Specific.

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<sup>30</sup> Depending on the sample size, quality of treatment and control matches and applicability of statistical corrections, the DUAT survey might serve as an IE source. However, as this will be a data driven problem and solution, we assume for the purposes of the EDR that this data will serve as a source for the rigorous performance evaluation questions.

EVALUATION QUESTION	ADMIN DATA	SURVEY	GIS	KIIs	FGDs	OTHER GOV & ADMIN DATA	OTHER SECONDARY DATA	SUB-GROUP ANALYSIS
1 Were project outputs sustained, particularly SIGIT and continued issuance of DUATs post compact, including those in <i>diferido</i> status?	•			•	•		•	•
2 Has the Land Project changed the efficiency of land administration, particularly changes in time, cost, and number of steps to conduct to process/acquire a DUAT or conduct a secondary land transaction?	•	•		•	•	•		•
3 Did the Land Project improve access to land and land markets, including changes in demand and approvals for DUATs and other secondary land transactions? Was there a related change in awareness or confidence in the land governance system? What are the characteristics of those applying for DUATs and conducting land transactions?	•	•		•	•	•		•
4 Did those parcels which received DUATs remain in the statutory system or were parcels transferred informally during the post compact period?	•	•		•	•	•		•
5 What was the effect of the Land Project on incidence of conflict?	•	•		•	•	•		•
6 Has the Land Project resulted in improved access to formal credit?		•		•	•	•		•
7 Did receipt of a DUAT lead to changes in perceptions of tenure security or defacto land tenure?		•		•	•	•		•
8 For households which received a DUAT, what was the impact on land investment and utilization, including transfer and renting of land? If there were changes in investment or utilization of land, what was the effect on land values?	•	•	•	•	•	•		•
9 Did effects differ by district/municipality, parcel size, land use or gender? For gender, were effects dependent on whose name was included on the DUAT?								•
10 Did those areas which received DUATs lead to demand for DUATs in neighboring areas or for demand for DUATs for additional parcels held by the beneficiary households?	•	•	•		•			•
11 In Land Project areas where project outputs (such as a complete cadaster and functioning SIGIT system) had the potential to motivate changes to municipal outcomes, does the evaluation find evidence of improvements in municipal planning, land taxes, and related supply and access to public services?		•	•	•	•	•		•
12 Was the process of commercial investment (in rural land) - when it took place in areas where DUATs had been issued by the project - expedited by the provision of DUATs with defined boundaries of land parcels to land holders? Does the availability of cadastral index maps with the list of DUAT holders help the government to direct investors to available land and help investors conclude investment agreements to access land? Did a DUAT, where held, aid DUAT holders to engage with government or investors related to potential investments?	•	•	•	•	•	•		•
ADDITIONAL IMPACT OUTCOMES		•						•

Figure 4. Evaluation Question and Methods Crosswalk

### 3.3 Institutional Strengthening – Evaluation Design

The endline Institutional Strengthening Evaluation will evaluate the impact and performance of the Capacity Building Activities described above in Section 2.1. The impact evaluation component is focused on different outcomes in municipalities, versus in rural districts. In municipalities, SI will assess the collective impact of SIGIT installation along with professional development and training and upgrading facilities. In districts, the IE can only estimate the impact of the latter, since SIGIT was implemented across all SPGCs, resulting in no valid control districts for the SIGIT component.

Relying on the classification scheme used by MSU to match treatment and comparison municipalities and districts at baseline, the endline evaluation will assess impact through a difference-in-differences (DID) identification strategy across the matched municipalities and districts (listed below in Table 3). The matching criteria used in the original impact evaluation designs included the overall selection criteria for receiving the Land Project, as well as similarity in geographic location and the condition of local land administration system before 2009 (the originally planned project implementation start time).<sup>31</sup>

The performance evaluation component of the Institutional Strengthening Activity evaluation will focus on the full package of Capacity Building Activities implemented at the national, provincial, municipal and district levels. For performance outcomes, we rely on qualitative and descriptive analysis, along with a thorough investigation of the context and enabling environment.

The Institutional Strengthening impact and performance evaluations will address MCC’s Evaluation Questions 1-4 and 11-12. Below, we summarize the key outcomes under these questions for the Institutional Strengthening evaluations (Table 2), followed by more in-depth description of our approach to answering each of those evaluation questions.

**Table 2. Institutional Strengthening Evaluation – Key Outcomes**

Evaluation Question	Performance Outcomes	Impact Outcomes <sup>32</sup>
<b>EQ1)</b> Were project <b>outputs sustained</b> , particularly SIGIT and continued issuance of DUAT certificates post-compact, including those in <i>diferido</i> status?	<ul style="list-style-type: none"> <li>• SIGIT sustainability</li> <li>• Capacity and stats of trained Cadastral officers</li> <li>• Sustainability of training program for Cadastral officers</li> <li>• Status of infrastructure and IT equipment</li> <li>• Continued issuance of DUAT certificates post-compact</li> </ul>	<ul style="list-style-type: none"> <li>• Number of DUAT certificate applications post September 2013 compared to pre project (September 2008)</li> <li>• Number of DUAT certificates issued post September 2013 compared to pre project (September 2008)</li> </ul>
<b>EQ2)</b> Has the Land Project changed the <b>efficiency of land administration</b> , particularly changes in time, cost, and number of steps to conduct to process/acquire a DUAT certificate or conduct a secondary land transaction?	<ul style="list-style-type: none"> <li>• Cost and efficiency (number of steps) changes for first time DUAT certificate processing/acquisition</li> <li>• Cost and efficiency (number of steps) changes for subsequent land transaction processing/acquisition</li> <li>• Sustainability and efficiency of land administration</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced processing time to obtain a DUAT certificate and to process subsequent land transactions</li> <li>• Reduction in time to process/acquire a secondary land transaction</li> </ul>

<sup>31</sup> For a detailed discussion of these criteria, refer to: Jin, et al., 2016a

<sup>32</sup> For a detailed breakdown of the planned sub-group analysis for each impact indicator, please reference the attached Indicator Crosswalk.

Evaluation Question	Performance Outcomes	Impact Outcomes <sup>32</sup>
<p><b>EQ3)</b> Did the Land Project improve <b>access to land and land markets</b>, including changes in demand and approvals for DUAT certificates and other secondary land transactions? Was there a related change in awareness or confidence in the land governance system? What are the characteristics of those applying for DUAT certificates and conducting land transactions?</p>	<ul style="list-style-type: none"> <li>• Access to land and land markets</li> <li>• Citizen awareness of the land governance system</li> <li>• Citizen confidence in the land governance system</li> <li>• Land-based investor confidence in land governance system</li> </ul>	<ul style="list-style-type: none"> <li>• Number of DUAT certificate applications post September 2013 compared to pre project (September 2008)</li> <li>• Number of first-time DUAT certificates approved pre/post project</li> <li>• Number of land transfers processed pre/post project</li> <li>• Characteristics of DUAT certificate applicants</li> <li>• Characteristics of landholders conducting land transactions</li> </ul>
<p><b>EQ4)</b> Did those parcels which received DUAT certificates remain in the statutory system or were parcels transferred informally during the post-compact period?</p>	<ul style="list-style-type: none"> <li>• Status of DUAT certificates in formal/informal system</li> </ul>	
<p><b>EQ11)</b> Where the success of project outputs (such as a complete cadaster and a SIGIT system still fully functioning post-compact) had the potential to change how municipalities provided services and related tasks, does the evaluation find evidence of improvements in municipal planning, land tax administration, and supply and access to public services?<sup>33</sup></p>	<ul style="list-style-type: none"> <li>• Use of land information for municipal planning</li> <li>• Use of land information for tax levy and collection</li> <li>• Public service access and quality</li> </ul>	
<p><b>EQ12)</b> Was the process of commercial investment (in rural land) - when it took place in areas where DUAT certificates had been issued by the project - expedited by the provision of DUAT certificates with defined boundaries of land parcels to land holders? Does the availability of cadastral index maps with the list of DUAT certificate holders help the government to direct investors to available land and help investors conclude investment agreements to access land? Did a DUAT certificate, where held, aid DUAT certificate holders to engage with government or investors related to potential investments?</p>	<ul style="list-style-type: none"> <li>• Efficiency of process for commercial investment</li> <li>• Presence of DUAT certificate facilitates engagement and negotiations between landholders and government/investors (applicable where there are cases of investment in the project areas that received DUAT certificates)</li> </ul>	

<sup>33</sup> Note that these outcomes represent secondary or unintended positive externalities from the Land Project that were flagged by stakeholders as potential results. As the Land Project did not focus on municipal service provision and taxation, the evaluation will treat these as incidental program effects and not primary program objectives. The evaluation will focus on examining these outcomes in municipal areas where project outputs, such as a complete cadaster and functioning SIGIT system, support the presence of these effects.

### 3.3.1 Institutional Strengthening, EQ1: Sustainability of project outputs

SI will explore performance outcomes related to the use and sustainability of the SIGIT system and related land office equipment; land administration specialist training; procedures established for sporadic and systematic regularization; and status of DUAT certificate issuance post-compact (for DUAT certificates pending issuance as of September 2013). We will investigate factors that either facilitated or hindered the continued use of SIGIT in project areas; for example, based on initial findings from the scoping and design trip, we will contrast the relatively successful case of Monapo vila with municipalities such as Nampula city and Cuamba where SIGIT is not operational. The evaluation will assess whether the procedures for sporadic and systematic regularization work and issuance of DUAT certificates are still being used by the Terra Segura project and other donors, or whether and why there have been adaptations to the process. We will explore the degree to which users and customers experience difficulty engaging with the system and whether there have been any updates to streamline or speed up the process.

Subgroup analysis for EQ1 will focus on assessing differential treatment effects between SPGCs and municipalities, due to fundamental differences in the urban municipalities and rural district context and beneficiaries. We will also investigate differences in continued issuance of DUAT certificates post-compact between investors and good faith occupants since the scoping and design trip confirmed that it is not only investors that seek sporadic DUAT certificates.

The two impact indicators of interest for EQ1 include DUAT certificate demand and DUAT certificate issuance, and for these indicators we will assess treatment heterogeneity by female/male held DUAT certificates, jointly versus individually held DUAT certificates, parcel size, and land use.<sup>34</sup> The key data sources used to investigate EQ1 indicators include SIGIT/land administrative records (electronic and paper<sup>35</sup>) from SPGCs and municipalities, KIIs with land administration officials, local leaders, and INFATEC, as well as secondary data from organizational reports and direct observation of land offices and equipment.

### 3.3.2 Institutional Strengthening, EQ2: Efficiency of land administration

For EQ2, SI will investigate the cost and efficiency of sporadic DUAT certificate processing for first time issuance and subsequent land transactions, as well as the overall sustainability of the land administration system. Related to EQ1, we will explore whether the process for systematic regularization has been maintained, streamlined, or complicated post compact.

The two impact indicators for this research question include processing times for (1) first-time issuance and (2) secondary transactions.<sup>36</sup> Subgroup analysis will focus on differential effects between SPGCs and municipalities, female/male held DUAT certificates, investors and good faith occupants, land use, parcel size and intra-family versus non-family transfers. Key data sources include: SIGIT/land administrative records from SPGCs, municipalities, and districts (if available); KIIs with land

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<sup>34</sup> If there is sufficient sample size, we will also analyze differential impacts for investors and non-investors.

<sup>35</sup> SIGIT records exist in a combination of electronic and paper formats, depending on the location/geographic level, individual land office, etc. SI assumes that in a majority of cases, SIGIT (electronic) records may not be available, and thus paper-based land administrative records will have to be systematically mined for relevant data points and digitized as part of this process. For simplicity in the rest of this document, we refer to SIGIT/land administrative records to refer to both paper and electronic records, with the expectation that it will be necessary to extract required data from the paper records when they are not available electronically.

<sup>36</sup> It is unclear whether data is available on the dates of request and approval for subsequent land transfers across all land offices. As a result, it may only be possible to assess the number and not the efficiency of processing transfers for a subset of the data.

### **3.3.3 Institutional Strengthening, EQ3: Access to land and land markets**

For EQ3, we explore whether the Land Project motivated improved land market access and improved confidence in the land administration system among investors, households and communities. There are two sets of land market dynamics we will explore via impact analysis: whether institutional strengthening activities contributed to demand for and related increased issuance of sporadic first time DUAT certificate issuance and whether they contributed to increased subsequent land transactions in the formal system. We will rely on SIGIT/land administrative records from SPGCs and municipalities, complemented by KIIs with land administration officials and local leaders, as well as land administration unit quarterly and annual reports. To assess changes in awareness and confidence in the land governance system emerging from Land Project support to institutional strengthening, we will carry out KIIs with investors. Subgroup analysis will focus on differential gender and rural/urban effects, as well as investors versus non-investors.

### **3.3.4 Institutional Strengthening, EQ4: Informal transfers of parcels with DUAT certificates**

EQ4 investigates the extent to which parcels with DUAT certificates remain in the formal system post-compact. FGDs, KIIs with land administrative units and local leaders will be important sources for understanding the extent of and reasons for formal and informal transfers. Qualitative subgroup analysis will examine the extent of informal transfers for female/male held DUAT certificates and for parcel size.

### **3.3.5 Institutional Strengthening, EQ11: Municipal planning, taxes, and public services**

For EQ11, we investigate whether land information is being used for municipal planning, as well as tax levy and collection. As these beneficiary streams were not an original focus or goal of the project but a potential benefit stream raised by stakeholders, research will focus on the areas where this benefit stream is most likely to occur, such as Metangula, Monapo Vila and other municipalities where the cadaster is complete and SIGIT continues to function. Data sources include KIIs with municipal land administration officials, DINAT, local *Registos Prediais*, and interviews with local revenue authorities. We will also conduct KIIs with mayors and municipal planning authorities to assess whether there have been improvements in access and quality of public service provision. Note that ISA findings for Monapo Vila will also inform the Urban Site-Specific findings described below for EQ 11 and vice versa.

### **3.3.6 Institutional Strengthening, EQ12: Increased ease of and efficiency of commercial investment**

For EQ12, the Institutional Strengthening Evaluation will address several outcomes related to the ease and efficiency of commercial land investment. Where applicable investment negotiations have occurred, we will explore whether the presence of DUAT certificates facilitated engagement and negotiations among landholders, government and investors. Key data sources will include KIIs with mayors, SDAE officials, land administration officials, investors, and representatives of the Agency for Investment and Export Promotion (APIEX).

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<sup>37</sup> We will also conduct a review of the spatial data included in the SIGIT to determine the reliability of data, as both a performance indicator of compliance with international standards and data quality measures for the evaluation.

**Table 3. Institutional Strengthening Activity: Treatment and Control Areas**

Location	Treatment	Control
<b>MUNICIPALITIES</b>		
Zambézia Province	Quelimane	Alto Molocue
	Mocuba	Gurue
Nampula Province	Monapo	Angoche
	Nampula city	Nacala-Porto
	Montepuez	
Cabo Delgado Province	Pemba	Mueda
	Moçimboa da Praia	Chiure
Niassa Province	Lichinga	Marrupa
	Cuamba	
	Metangula	
<b>DISTRICTS</b>		
Zambézia Province	Nicodala	Alto Molocue
	Morrumbala	
	Mocuba	
Nampula Province	Malema	Nampula
	Monapo	
	Moma	Nacala
Cabo Delgado Province	Moçimboa da Praia	Pemba
	Montepuez	
	Mecufi	Palma
Niassa Province	Majune	Cuamba
	Lichinga	
	Metangula	Mandimba

### 3.3.7 Institutional Strengthening Evaluation – Data Sources

Below we provide additional description of the quantitative and qualitative data sources for the Institutional Strengthening Evaluation. All instruments will be adapted or developed in consultation with MCC and local stakeholders when this follow-up evaluation enters the option period in summer 2019. Please refer to Annex 6.2 for a detailed mapping of data sources and indicators.

#### 3.3.7.1 Quantitative Data Sources

- **Land Administrative Data.** Our proposed endline sample for the impact evaluation is the universe of DUAT certificate land records from Northern Province SPGCs and municipalities, with a focus on

records from 2015-2019. Baseline and endline land administration unit data from the 16 matched treatment and control municipalities and from the 19 matched treatment and control districts listed above in Table 3 will be the primary data source for assessing impact outcomes. For baseline, the impact evaluation approach will utilize the scanned paper records collected as far back as 1980 by the MSU team for the same set of matched treatment and control municipalities and districts. The years of direct implementation (2012-2014) will be included in the performance evaluation but excluded from the impact analysis, which will focus on 2015-2019. We will request the complete record for each DUAT certificate, including all data on subsequent transactions and/or conflict records. This will require scanning and digitizing information that is not currently in SIGIT or an electronic format.

- **GIS.** Geospatial data will provide data on roads, markets, and the types and locations of investors across the study area. We will access this data for the four Northern Provinces of our study area to provide contextual background and to generate descriptive statistics that will inform the analysis.
- **Direct Observation.** As part of the LAU KII, the local data collection partner will also physically observe the infrastructure and technology systems implemented as part of the Compact, including cadastral offices and SIGIT. This will be completed across DINAT, the four SPGC offices, and the matched targeted districts (19) and municipalities (16).
- **Other government/administrative data.** The evaluation will also collect secondary data to inform the analysis. We aim to collect time trend data on local government and municipal budgets, building and construction permits over time, bank and micro-finance information, tax collection and service delivery indicators for the 19 matched treatment and control districts and municipalities. Note that data collection and analysis for municipal budgeting, service provision, taxation and service delivery will focus on municipalities, such as Monapo Vila, where the cadaster was completed and SIGIT continues to function. If available and accessible, we will also request notary and *Registo Predial* data to determine property investments and land valuation. We will request data going back to 2008/2009 through 2018. We will also analyze pre and post project descriptive statistics from the Compact and post-compact M&E data, as well as INFATEC data on the status of trainings for land administration professionals to examine the sustainability of capacity building measures.
- **Other secondary data.** The evaluation will also rely on M&E data and project reports from implementing partners.

### 3.3.7.2 Qualitative Data Sources

- **Land administration unit KIIs.** The evaluation will conduct structured KIIs with land administration officials at the national (DINAT headquarters), provincial (SPGCs), as well as district and municipal land offices. The sample will include SIGIT technicians (where relevant) and field surveyors, as well as any staff tasked with managing a conflict office or registry.
- **KIIs with other relevant stakeholders.** The evaluation will conduct open-ended KIIs with local elected officials and leaders across provinces, and the matched targeted districts (19) and municipalities (16). This will involve mayors or Presidents of the Municipalities in municipalities and SDAE officials in districts. There will be open-ended KIIs with DINAT officials and Municipal/District/SPGC Office Directors. SI will also conduct KIIs with local implementing partners, *Registo Prediales* and notaries, bank and micro-finance institutions, investors, APIEX, and donors with relevant land programming.

- **Secondary reports.** Depending on availability, a number of secondary reports will inform the analysis. These include reports (where available) from land administrative units, the World Bank (e.g. SIGIT audit and other reports prepared as part of preparation for the ‘MozLand’ project), APIEX, CFJJ, notaries and *Registo Predial*, as well as background documents and studies from Terra Firma, Centro Terra Viva (CTV), EXI and Verde Azul.

### 3.4 Rural Site-Specific – Evaluation Design

The Rural Site Evaluation proposes a mixed method design that measures impact and performance outcomes for interventions under the Site-Specific Activity that focused on systematic regularization and knowledge/awareness. These activities were implemented in the hotspot areas of Mecufi district in Cabo Delgado and Malema district in Nampula. Tenure regularization included the demarcation of plots, household registration of land rights and distribution of DUAT certificates. Knowledge and awareness raising included the development of civic education materials and communication initiatives at local level (including seminars, workshops and public hearings) and support to local authorities in providing the public with up-to-date information on land rights and regularization. The two hotspot areas were selected for evaluation based on the ability to identify valid comparison villages (*aldeias*) within the districts and a project implementation timeline that allowed sufficient exposure time for determining end-line impacts. *Aldeia* selection was conducted by district authorities (and HTSPE) based on some set criteria and were outside the control/influence of the MSU impact evaluation team.<sup>38</sup>

The Rural Site Evaluation will assess the impacts on beneficiaries of the Land Project’s rural Site-Specific interventions in the rural hotspots of Mecufi and Malema district, as compared to households in control areas. We will measure impacts at the household level on demand for DUAT certificates, access to credit, confidence in the land governance system, perceptions of tenure security, land investment, agricultural productivity and livelihoods, among other outcomes. Causal inference will be based on the original difference-in-differences design developed by MSU at baseline in the rural hotspots of Mecufi and Malema districts.

Based on an MSU 2016 scoping trip, there were rumors of a large-scale land acquisition within the Mecufi study area that could have resulted in the relocation of a substantial number of households surveyed during the baseline. To determine whether Mecufi was still viable for the impact analysis, the SI evaluation team used DUAT certificate geospatial data provided by DINAT, to determine whether any large scale commercial DUAT certificates overlapped with treatment and control *aldeias*. Based on data provided, there was no evidence of DUAT certificate overlap with *aldeias* in the study area. Also, informational interviews conducted during the SI evaluation team’s 2018 scoping and design trip did not provide evidence that large-scale land acquisition had occurred in the hotspot area. Therefore, we believe this to be a viable impact design.

Beyond impact outcomes that can be estimated through a rigorous econometric approach, the Rural Site Evaluation will address Land Project outputs, performance outcomes, sustainability and spillover effects across Malema and Mecufi districts. Overall, this approach will inform and complement the impact analysis, while providing answers to MCC’s performance-related research questions. The impact analysis will utilize the household panel surveys in Malema and Mecufi, as well as satellite imagery to explore land use change and land and property investments. In addition to the household panel survey data, the performance evaluation component will rely on a wives’ surveys, qualitative data from FGDs and semi-

<sup>38</sup> For a detailed discussion of the baseline design process, refer to: Jin, et al., 2016

structured surveys with land administration officials and local leaders. These core data sources will be supplemented by open-ended KIIs, as well as information and data from secondary reports, including Compact and post-compact M&E reports.

The Rural Site Evaluation will focus on MCC’s EQ3-EQ8, EQ10 and EQ12. Note that we will integrate subgroup analysis (EQ9) for each evaluation question. Below, we further detail the key performance and impact outcomes to be investigated as part of the rural site-specific evaluation, and our approach to addressing each evaluation question that falls under the rural site-specific evaluation.

**Table 4. Rural Site-Specific Evaluation – Key Outcomes**

Evaluation Question	Performance Outcomes	Impact Outcomes <sup>39</sup>
<b>EQ3)</b> Did the Land Project improve <b>access to land and land markets</b> , including changes in demand and approvals for DUAT certificates and other secondary land transactions? Was there a related change in awareness or confidence in the land governance system? What are the characteristics of those applying for DUAT certificates and conducting land transactions?	<ul style="list-style-type: none"> <li>• Access to land and land markets</li> <li>• Citizen awareness of land governance system</li> <li>• Citizen confidence in land governance system</li> <li>• Investor confidence in land governance system</li> </ul>	<ul style="list-style-type: none"> <li>• Citizen awareness of land governance system</li> <li>• Citizen confidence in land governance system</li> <li>• Demand for secondary land transactions, along with characteristics of landholders conducting land transactions.</li> </ul>
<b>EQ4)</b> Did those parcels which received DUAT certificates remain in the statutory system or <b>were parcels transferred informally</b> during the post-compact period?	<ul style="list-style-type: none"> <li>• Extent of informal vs. formal DUAT certificate transfers</li> </ul>	
<b>EQ5)</b> What was the effect of the Land Project on <b>incidence of conflict</b> ?	<ul style="list-style-type: none"> <li>• Extent of land related conflict</li> <li>• Improvements in conflict management system</li> </ul>	<ul style="list-style-type: none"> <li>• Extent of land-related conflicts</li> </ul>
<b>EQ6)</b> Has the Land Project resulted in improved <b>access to formal credit</b> ?	<ul style="list-style-type: none"> <li>• Access to formal and informal credit</li> </ul>	<ul style="list-style-type: none"> <li>• Access to formal and informal credit</li> </ul>
<b>EQ7)</b> Did receipt of a DUAT certificate lead to changes in <b>perceptions of tenure security</b> or de facto land tenure?	<ul style="list-style-type: none"> <li>• Perceptions of tenure security</li> <li>• n</li> </ul>	<ul style="list-style-type: none"> <li>• Perceptions of tenure security</li> </ul>
<b>EQ8)</b> For households which received a DUAT certificate, what was the impact on <b>land investment and utilization</b> , including transfer and renting of land? If there were changes in investment or utilization of land, what was the effect on <b>land values</b> ?	<ul style="list-style-type: none"> <li>• Land and property investments</li> <li>• Land use practices</li> <li>• Incidence of land transfers</li> <li>• Land valuation</li> <li>• Rental markets</li> </ul>	<ul style="list-style-type: none"> <li>• Land and property investments</li> <li>• Land use change</li> <li>• Incidence of land transfers</li> <li>• Land valuation</li> <li>• Rental markets</li> </ul>
<b>EQ10)</b> Did those areas which received DUAT certificates lead to <b>demand for DUAT certificates</b> in neighboring areas or for demand for DUAT certificates for additional parcels held by the beneficiary households?	<ul style="list-style-type: none"> <li>• Spillover effects (DUAT certificate demand), along with characteristics of landholders demanding DUAT certificates</li> <li>• Demand for new DUAT certificates (sporadic) by systematic regularization beneficiaries, along with characteristics of landholders demanding DUAT certificates</li> </ul>	<ul style="list-style-type: none"> <li>• Demand for new DUAT certificates (sporadic) by systematic regularization beneficiaries, along with characteristics of landholders demanding DUAT certificates</li> </ul>

<sup>39</sup> For a detailed breakdown of the planned sub-group analysis for each impact indicator, please reference the Indicator Crosswalk document.

	<ul style="list-style-type: none"> <li>• Demand for parcels with DUAT certificates versus those without DUAT certificates</li> </ul>	
<p><b>EQ12)</b> Was the process of commercial investment (in rural land) - when it took place in areas where DUAT certificates had been issued by the project - expedited by the provision of DUAT certificates with defined boundaries of land parcels to land holders? Does the availability of cadastral index maps with the list of DUAT certificate holders help the government to direct investors to available land and help investors conclude investment agreements to access land? Did a DUAT certificate, where held, aid DUAT certificate holders to engage with government or investors related to potential investments?</p>	<ul style="list-style-type: none"> <li>• Efficiency of process for commercial investment</li> <li>• Presence of DUAT certificate facilitates engagement and negotiations between landholders and government/investors (applicable where there are cases of investment in the project areas that received DUAT certificates)</li> </ul>	
<p><b>Other impact outcomes</b></p>	n/a	<ul style="list-style-type: none"> <li>• Extent of off-farm opportunities (labor mobility)</li> <li>• Livelihood– income, health and education</li> </ul>

### 3.4.1 Rural Site-Specific, EQ3: Access to land and land markets

For EQ3, we explore outcomes related to citizen awareness of and confidence in the land governance system. We will analyze household demand for DUAT certificates and secondary land transactions as outcomes resulting from systematic regularization and awareness raising. The key data sources from Malema and Mecufi districts include household panel surveys, land administration data, wives’ surveys, KIIs with local leaders, and FGDs with women, men, households with different types of land access, and elders/respected member of the community. In addition to testing differential gender effects for the impact analysis, we will use the household data and wives surveys to complete subgroup analysis of the characteristics of persons applying for DUAT certificates/conducting land transfers (e.g. by sex, age, education, marital status, income, assets, land size, and land use).

### 3.4.2 Rural Site-Specific, EQ4: informal transfers of parcels with DUAT certificates

EQ4 investigates the extent to which parcels with DUAT certificates remain in the formal system post-compact. Household surveys, KIIs with officials from land administrative units and local leaders, and FGDs will be important sources for understanding the extent and drivers of informal transfers. Subgroup analysis will examine the extent of informal transfers by land use characteristics, female/male held DUAT certificates, and socio-economic characteristics.

### 3.4.3 Rural Site-Specific, EQ5: Incidence of conflict, and EQ7: Perceptions of tenure security

EQ5 and EQ7 focus on outcomes related to conflict, conflict management, perceptions of tenure security and incidents of expropriation as a source of conflict and tenure insecurity. Impact indicators for conflict incidence and perceptions of tenure security will rely on Malema and Mecufi household panel survey

data. Given problems with the baseline conflict roster, the endline will depend on a limited number of panel conflict questions and use survey recall methods to collect historical data on conflict incidence. The surveys will also explore the nature of land conflicts to enable differentiation of conflicts over boundaries, ownership, expropriation, compensation and conflicts with internal (e.g. family members, neighbors) versus external actors (e.g. investors). Results from wives' surveys, FGDs and local leader KIIs will form the bulk of the evidence to inform the performance findings and contextual analysis. Data collection instruments will explore citizens' expectations of land being taken from them, and the mechanisms through which certification affects perceptions of tenure security, including the ability to present certificates as evidence of land rights to courts and other bodies in the event of land disputes. In addition, we will supplement the core data sources with KIIs and secondary reports (where available) from investors and NGOs/stakeholders working in the land tenure and conflict space, such as CTV, ITC, CFJJ, Verde Azul and Terra Firma. We will analyze differential tenure and conflict dynamics by land use, gender and parcel size. Parcel size and income or asset data will be used to explore differences based on relative wealth and power.

#### **3.4.4 Rural Site-Specific, EQ6: Access to credit, and EQ8: Land investment and utilization**

EQ6 and EQ8 examine access to credit, household investments on property and land use, land markets and land values. For credit indicators, we supplement household panel surveys, FGDs and wives' surveys from Malema and Mecufi with KIIs and secondary data (where available) from notaries, banks, and micro-finance institutions. Household surveys will also be used to capture information on household investments, land uses, land rentals, and will be complemented by information gathered through FGDs and local leader KIIs. Since land cannot be sold in Mozambique, land values will be derived from household survey data on land rentals and investments in land improvements, as well as through a review of construction permits (pending data availability). Depending on the availability, cost and appropriate resolution of satellite data, the evaluation team will use satellite imagery to assess household investments in visible improvements and changes in land utilization. The land transfer information gathered for EQ4 will also be used to inform EQ8 as far as the extent to which project beneficiaries are transferring their land.

#### **3.4.5 Rural Site-Specific, EQ10: Demand for DUAT certificates**

To examine spillover and the extent of demand for new certifications of DUAT certificates (EQ10), the performance evaluation component will assess the extent of DUAT certificate demand during and after the Land Project regularization for beneficiary households and those adjacent to treatment areas. Demand by beneficiary households for formalization of new parcels will be measured in the household panel survey of the treatment area in addition to FGDs and local leader KIIs. To assess spillover effects, we will rely on land administrative data and associated shapefiles of sporadic DUAT certificate requests in neighboring areas both during and after systematic regularization.

#### **3.4.6 Rural Site-Specific, EQ12: Ease and efficiency of commercial investment**

The Rural Site Evaluation will assess whether the Land Project affected the ease and efficiency of commercial investment (EQ12).<sup>40</sup> Data sources to address this question will focus on KIIs with local leaders (government and community), commercial investors in Malema and Mecufi districts, land

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<sup>40</sup> The difference between the evaluation carried out in the rural and urban site-specific evaluations versus the institutional strengthening evaluation is that in the site-specific evaluations, the effect will be confined to the hotspot areas to observe the additional effects of the regularization and awareness raising interventions.

administration officials and authorities at APIEX responsible for promoting commercial investment. In cases of commercial investment in the project areas that received DUAT certificates, we will also assess whether the presence of DUAT certificates facilitates engagement and negotiations among landholders, government and investors. This question will be address through KIIs with a variety of stakeholders, community leader surveys, household surveys, wives’ surveys, and FGDs with elders.

**Table 5. Rural Site-Specific Evaluation, Treatment and Control Aldeias<sup>41</sup>**

Location	Treatment	Control
ALDEIAS		
Mecufi (Cabo Delgado Province)	Maueia Muitua Ngoma	Secura A Secura B Zaulane A Zaulane B
Malema (Nampula Province)	Cabo Miquitaculo Cabo Niquile	Cabo Macassa

### 3.4.7 Rural Site-Specific Evaluation – Data Sources

Below we provide additional description of the quantitative and qualitative data sources for the Rural Site-Specific Evaluation. All instruments will be adapted or developed in consultation with MCC and local stakeholders when this follow-up evaluation enters the option period in summer 2019. Please refer to Annex 6.2 for a detailed mapping of data sources and indicators.

#### 3.4.7.1 Quantitative Data Sources

- **Household Surveys.** As part of the rural site-specific evaluation, two distinct survey efforts will be conducted, as described below.
  - **Malema and Mecufi districts:** The Mecufi and Malema household panel surveys will be the primary data source for measuring Land Project impacts in the rural hotspots. The endline surveys will generally rely on the baseline survey, but with a few additions to improve the outcome measures, such as survey experiments, and removal of questions where we lack variation. We propose including survey experiments to assess certain outcomes – such as informal transfers, conflicts and gender equality – and other sensitive or hard to measure outcomes.
  - **Wives’ survey:** We will conduct a survey with approximately one thousand wives across the Malema and Mecufi household samples. In cases where there is a male head of household for the original household panel, a separate wives survey will be directed to the wife (or first wife in polygamous households). The module will replicate many of the same household questions for key outcomes and include new modules to investigate women’s experience with local land governance, land conflict, engagement with land markets, etc.
- **Land Administrative data.** For the Rural Site Evaluation, our proposed endline sample is the universe of DUAT certificate land records from Malema and Mecufi districts. The years of direct

<sup>41</sup> The unit of observation for the rural site-specific evaluation is the household with matching at the household, rather than aldeia level.

implementation (2012 -2014) will be included in the performance evaluation but excluded from the impact analysis, which will focus on 2015-2019. We will request (or digitize) the complete record for each DUAT certificate, including all data on subsequent transactions and/or conflict records. Where records are not already available in the SIGIT system, this will require scanning and digitizing information that is not currently in SIGIT or an electronic format.

- **Community Leader survey.** We propose 3 structured surveys with elders and traditional authorities. Community leader surveys will be conducted in all matched treatment and control *aldeias* for Malema and Mecufi. To address questions regarding spillover, Community Leader surveys will also be fielded in non-project aldeia bordering five treatment aldeias.
- **Satellite data.** To examine property investments and land-use change, the evaluation proposes high resolution pre-processed daytime satellite imagery of the Mecufi and Malema hotspots. Based on time and resource constraints, we are not prioritizing nighttime satellite imagery to examine service delivery outcomes for electricity in the rural areas since these indicators are not as well connected to the Land Project’s TOC.
- **Geospatial data.** Geospatial proxies will be used in both the impact and performance analysis to better understand how market pressures and distance to land that is valuable for investment purposes mitigate the program effects. We will use geospatial proxies to measure the heterogeneity of treatment impacts, including location of land-based investment projects; distance to roads; distance to markets; distance to tourist sites; land quality measures; mineral/gas/forest distances. This will supplement household survey modules asking about land transactions, values, and investment.
- **Other secondary data.** The evaluation will also rely on M&E data and project reports from implementing partners.

#### 3.4.7.2 Qualitative Data Sources

- **Open-ended stakeholder**
- **s.** We propose KIIs with SDAE in the districts and treatment and control *aldeias* in Mecufi and Malema districts, as they are important resources to understand the local dynamics surrounding land governance and dispute resolution. Open-ended KII will also be conducted with SPGC and district Office Directors. KIIs with NGOs and stakeholders in Maputo, as well as with investors in Malema and Mecufi districts with investors (where relevant) will be used to contextualize the results obtained through the household survey and provide insights into the incentives and dynamics of various stakeholders and institutional beneficiaries. These KIIs will provide additional nuanced context information about Land Project implementation and changes since the end of the project.
- **Land administration official KIIs.** We propose collecting the structured LAU KII as part of the LAU land record data collection launch.
- **FGDs.** FGDs will be conducted in a subset of the matched treatment and control *aldeias* in Malema and Mecufi to address outcomes and context that are not available from other sources. Our groups of interest include adult men and adult women, elders/ leaders responsible for dispute resolution, small and medium land size holders, households that have engaged in credit-taking, as well as households engaged in land transfers. In Mecufi, in cases where displacement due to expropriation has occurred, we will also organize FGDs with the displaced. To address questions regarding

spillover, we propose holding FGDs (mixed male/female participants) in two non- project aldeias bordering each treatment aldeia (a total of 4 FGDs for spillover in rural areas).

### 3.5 Urban Site-Specific – Evaluation Design

The Urban Site-Specific Evaluation proposes a complementary mixed-method impact and performance evaluation of the Land Project's Site-Specific Activity. The Site-Specific Activities that are subject to the evaluation include: a) systematic regularization and issuance of DUAT certificates in selected municipal hotspots within Nampula City and Monapo Vila, and b) knowledge and awareness raising within the same two hotspots. Knowledge and awareness raising included the development of civic education materials and communication initiatives at local level (including seminars, workshops, and public hearings) and support to local authorities in providing the public with up-to-date information on the land rights and regularization. The urban hotspots were selected at baseline by the MSU evaluation team, in coordination with MCC/MCA, based on the following criteria: (1) bairros facing the same hotspot issues (i.e., expansion and regularization challenges); (2) ability to identify valid comparison bairros; and (3) a timeline for project interventions that would allow a long enough exposure time to observe changes in outcomes and impacts at endline. For additional information on the baseline design process, please refer to 2016 MSU EDR.

The Urban Site-Specific Evaluation will assess the impact of tenure regularization and awareness raising, including demarcation of plots, household registration of land rights and distribution of DUAT certificates. It will focus on impacts to household beneficiaries with and without DUAT certificates; causal inference will be based on the original difference-in-differences (DID) design developed by MSU at baseline. In addition to the household panel data from Nampula City, the impact evaluation component will rely on high-resolution satellite imagery to explore investment and land utilization outcomes.

The endline Urban Site-Specific Evaluation will focus only on the Nampula City hotspot whereas the original urban impact evaluation design also included Monapo Vila. In Monapo vila, designated control areas also received DUAT certificates as part of a full cadaster implementation, therefore, an impact evaluation is no longer possible. Outcomes in Monapo Vila will instead be explored through an in-depth case study as part of a rigorous performance evaluation; this is described in more detail later in this section. The Urban Site-Specific Evaluation will measure impacts at the household level on demand for DUAT certificates, access to credit, confidence in the land governance system, perceptions of tenure security, property investments, service delivery and livelihood improvements, among other outcomes. The impact analysis will rely on a household panel survey and high-resolution satellite imagery.

While impact analysis will focus on Nampula City, we will also investigate Land Project performance outputs, outcomes, sustainability, and spillover effects across both Monapo Vila and Nampula City. Monapo Vila will serve as an in-depth case study, given the implementation of a full cadaster and functioning SIGIT system. The performance evaluation will inform and complement the causal analysis, while providing answers to MCC's performance related research questions related to SIGIT sustainability, land valuation, land transfers, commercial investment, etc. In addition to the household panel data from Nampula City, the performance evaluation component will rely heavily on a high-resolution satellite imagery for Monapo Vila and a household panel in Monapo Vila, wives' surveys in Monapo Vila and Nampula City. Qualitative data will include FGDs, semi-structured KIIs with land administration officials and local leaders, and open-ended interviews with a variety of KII, as well as information and data from secondary reports.

The Urban Site-Specific Evaluation will focus on MCC’s EQ 3-12. Note that we will integrate subgroup analysis (EQ9) for each evaluation question. Below, we further detail our approach to addressing each of MCC’s evaluation questions and the key performance and impact outcomes to be investigated as part of the Urban Site-Specific Evaluation.

**Table 6. Urban Site-Specific Evaluation – Key Outcomes**

Evaluation Question	Performance Outcomes	Impact Outcomes <sup>42</sup>
<b>EQ3)</b> Did the Land Project improve <b>access to land and land markets</b> , including changes in demand and approvals for DUAT certificates and other secondary land transactions? Was there a related change in awareness or confidence in the land governance system? What are the characteristics of those applying for DUAT certificates and conducting land transactions?	<ul style="list-style-type: none"> <li>• Access to land and land markets</li> <li>• Citizen awareness of land governance system</li> <li>• Citizen confidence in land governance system</li> <li>• Investor confidence in land governance system</li> </ul>	<ul style="list-style-type: none"> <li>• Citizen awareness of land governance system</li> <li>• Citizen confidence in land governance system</li> <li>• Demand for secondary land transactions pre/post project, along with characteristics of landholders conducting land transactions.</li> </ul>
<b>EQ4)</b> Did those parcels which received DUAT certificates remain in the statutory system or <b>were parcels transferred informally</b> during the post-compact period?	<ul style="list-style-type: none"> <li>• Extent of informal vs. formal DUAT certificate transfers</li> </ul>	
<b>EQ5)</b> What was the effect of the Land Project on <b>incidence of conflict</b> ?	<ul style="list-style-type: none"> <li>• Extent of land related conflict</li> <li>• Improvements in conflict management system</li> </ul>	<ul style="list-style-type: none"> <li>• Extent of land-related conflicts</li> </ul>
<b>EQ6)</b> Has the Land Project resulted in improved <b>access to formal credit</b> ?	<ul style="list-style-type: none"> <li>• Access to formal and informal credit</li> </ul>	<ul style="list-style-type: none"> <li>• Access to formal and informal credit</li> </ul>
<b>EQ7)</b> Did receipt of a DUAT certificate lead to changes in <b>perceptions of tenure security</b> or de facto land tenure?	<ul style="list-style-type: none"> <li>• Perceptions of tenure security</li> <li>• Incidence and extent of expropriation</li> </ul>	<ul style="list-style-type: none"> <li>• Perceptions of tenure security</li> </ul>
<b>EQ8)</b> For households which received a DUAT certificate, what was the impact on <b>land investment and utilization</b> , including transfer and renting of land? If there were changes in investment or utilization of land, what was the effect on <b>land values</b> ?	<ul style="list-style-type: none"> <li>• Land and property investments</li> <li>• Land use practices</li> <li>• Incidence of land transfers</li> <li>• Land valuation</li> <li>• Rental markets</li> </ul>	<ul style="list-style-type: none"> <li>• Land and property investments</li> <li>• Land use change</li> <li>• Incidence of land transfers</li> <li>• Land valuation</li> <li>• Rental markets</li> </ul>
<b>EQ10)</b> Did those areas which received DUAT certificates lead to <b>demand for DUAT certificates</b> in neighboring areas or for demand for DUAT certificates for additional parcels held by the beneficiary households?	<ul style="list-style-type: none"> <li>• Spillover effects (DUAT certificate demand), along with characteristics of landholders demanding DUAT certificates</li> <li>• Demand for new DUAT certificates (sporadic) by systematic regularization beneficiaries, along with characteristics of landholders demanding DUAT certificates</li> <li>• Demand for parcels with DUAT certificates versus those without DUAT certificates</li> </ul>	<ul style="list-style-type: none"> <li>• Demand for new DUAT certificates (sporadic) by systematic regularization beneficiaries pre/post project, along with characteristics of landholders demanding DUAT certificates</li> </ul>

<sup>42</sup> For a detailed breakdown of the planned sub-group analysis for each impact indicator, please reference the attached Indicator Crosswalk.

<p><b>EQ11)</b> Where the success of project outputs (such as a complete cadaster and a SIGIT system still fully functioning post-compact) had the potential to change how municipalities provided services and related tasks, does the evaluation find evidence of improvements in municipal planning, land tax administration, and supply and access to public services?<sup>43</sup></p>	<ul style="list-style-type: none"> <li>• Municipal land use planning</li> <li>• Changes in land taxes</li> <li>• Municipal service supply planning</li> <li>• HH access to public services</li> <li>• HH perception of service quality</li> </ul>	<ul style="list-style-type: none"> <li>• HH access to public services</li> <li>• HH perception of service quality</li> </ul>
<p><b>EQ12)</b> Was the process of commercial investment- when it took place in areas where DUAT certificates had been issued by the project - expedited by the provision of DUAT certificates with defined boundaries of land parcels to land holders? Does the availability of cadastral index maps with the list of DUAT certificate holders help the government to direct investors to available land and help investors conclude investment agreements to access land? Did a DUAT certificate, where held, aid DUAT certificate holders to engage with government or investors related to potential investments?</p>	<ul style="list-style-type: none"> <li>• Efficiency of process for commercial investment</li> <li>• Presence of DUAT certificate facilitates engagement and negotiations between landholders and government/investors (applicable where there are cases of investment in the project areas that received DUAT certificates)</li> </ul>	
<p><b>Other impact outcomes</b></p>	<p>n/a</p>	<ul style="list-style-type: none"> <li>• Livelihood– income, health and education</li> </ul>

### 3.5.1 Urban Site-Specific, EQ3: Access to land and land markets

For EQ3, we explore impact and performance measures of citizen awareness and confidence in the land governance system and analyze household demand for DUAT certificates and secondary land transactions as outcomes resulting from systematic regularization and awareness-raising. The key data sources include the household panel surveys and wives’ surveys in Nampula and Monapo vila , FGDs with women, men, elders, business owners and people living in informal settlements, and semi-structured KIIs with local leaders and land administrative units. Panel surveys will be repeated in Monapo vila even though it is not part of the IE any longer, in order to have as rigorous as possible a before-and-after measure of household-level outcomes. Our subgroup analysis for EQ3 will focus on assessing differential effects by gender, socio-economic status, land use and household characteristics.

### 3.5.2 Urban Site-Specific, EQ4: informal transfers of parcels with DUAT certificates

EQ4 investigates the extent to which parcels with DUAT certificates remain in the formal system post-compact. The household panel surveys, wives’ surveys, and FGDs, as well as KIIs with land administration officials and local leaders will be important sources for understanding the extent and reasons for formal versus informal transfers. Subgroup analysis will examine the extent of informal transfers by land use characteristics, gender, and socio-economic characteristics.

<sup>43</sup> Note that these outcomes represent secondary or unintended positive externalities from the Land Project that were flagged by stakeholders as potential results. As the Land Project did not focus on municipal service provision and taxation, the evaluation will treat these as incidental program effects and not primary program objectives. The evaluation will focus on examining these outcomes in municipal areas where project outputs, such as a complete cadaster and functioning SIGIT system, support the presence of these effects.

### 3.5.3 Urban Site-Specific, EQ5: Incidence of conflict, and EQ7: Perceptions of tenure security

EQ5 and EQ7 focus on outcomes related to conflict, conflict management, perceptions of tenure security, and incidents of expropriation as a source of conflict and tenure insecurity. Impact indicators for conflict incidence and perceptions of tenure security will rely on the Nampula panel household survey data, although we note, importantly, that there are a limited number of viable conflict indicators from baseline, due to an error in applying survey logic by the MSU/MITADER data collection teams at baseline. Beyond impact, the household surveys and gender modules in Nampula and Monapo Vila will also explore the nature of land conflicts to enable differentiation of conflicts over boundaries, ownership, expropriation/compensation and conflicts with investors. Results from the household panels, wives' surveys, citizen FGDs and local leader KIIs will form the bulk of the evidence to inform the performance findings and contextual analysis. In addition, we will supplement the core analysis with contextual information or background information from investors and NGOs/stakeholders working in the land tenure and conflict space, such as CTV, iTC, CFJJ, Verde Azul and Terra Firma. We will analyze differential tenure and conflict dynamics by land and household characteristics, gender and socio-economic indicators.

### 3.5.4 Urban Site-Specific, EQ6: Access to credit, and EQ8: Land investment and utilization

EQ6 and EQ8 examine access to credit, household investments on property and land use, land markets, and land values. For credit indicators, we supplement the household surveys, wives' survey, and citizen FGDs from Nampula City and Monapo Vila with semi-structured KIIs, and secondary data to the extent available and accessible, from banks, micro-finance lending institutions and notaries. Household and wives' surveys will be used to capture information on property investments, land uses, land rentals, and will be complemented by information gathered through FGDs. High-resolution satellite data will be used as a key data source to assess household investment in visible property improvements. Since land cannot be sold in Mozambique, land values will be derived from household survey data on land rentals and investments in land/property improvements, as well as through a review of construction permits (pending data availability). If accessible, *Registo Predial* data on inventory improvements and property valuations will be an important data source. The land transfer information gathered for EQ4 will also be used to inform EQ8, as far as the extent to which project beneficiaries are transferring their land.

### 3.5.5 Urban Site-Specific, EQ10: Demand for DUAT certificates

Demand for first issuance of DUAT certificates and subsequent transactions will feature in the Urban Site-Specific Evaluation given their links to awareness raising and systematic issuance of DUAT certificates. To examine spillover and the extent of sporadic DUAT certificate demand (EQ10), the performance evaluation component will assess the extent of sporadic DUAT certificate demand during and after Land Project regularization for beneficiary households and those adjacent to treatment areas. In addition to FGDs and KIIs with land administrative units and local leaders, we will rely on land administration data and associated shapefiles of sporadic DUAT certificate requests across these areas.

### 3.5.6 Urban Site-Specific, EQ11: Municipal planning, taxes, and public services

The endline evaluation will assess performance indicators related to whether the Land Project had secondary or unintended positive effects on municipal planning, service delivery supply, access and quality, as well as the collection of tax revenues (EQ11), even if such effects cannot be fully attributed to the MCC investment. We will examine these outcomes in the context of Monapo Vila, which has a

complete cadaster and where SIGIT continues to function. Performance indicators on taxation, municipal planning, and public service delivery will be informed by a number of sources from Monapo Vila, including high-resolution satellite imagery, household surveys, citizen FGDs, KIIs with municipal land administration officials and municipal planning authorities, as well as revenue authority data on tax revenue collection where available.<sup>44</sup> Note that these findings for Monapo Vila will also inform the ISA findings for EQ 11 and vice versa.

### **3.5.7 Urban Site-Specific, EQ12: Ease and efficiency of commercial investment**

Finally, EQ12 will be evaluated via the performance component of the Urban Site-Specific Evaluation to understand whether the Land Project affected the ease and efficiency of commercial investment (EQ12).<sup>45</sup> Data sources to address this question will focus on KIIs with local leaders (government and community), commercial investors in Nampula City and Monapo Vila municipalities, land administration officials and authorities at APIEX responsible for promoting commercial investment. In cases of commercial investment in the project areas that received DUAT certificates, we will also assess whether the presence of DUAT certificates facilitates engagement and negotiations among landholders, government and investors. This question will be address through household surveys, local leader KIIs, wives' surveys, and FGDs with household level beneficiaries.

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<sup>44</sup> These results complement the findings of the Institutional Strengthening Evaluation on these outcomes, but, in contrast, assess the additional effects of the systematic regularization and awareness raising components the Land Project on broader land governance — land use planning, tax collection, and public service delivery.

<sup>45</sup> The difference between the evaluation carried out in the rural and urban site-specific evaluations versus the institutional strengthening evaluation is that in the site-specific evaluations, the effect will be confined to the hotspot areas to observe the additional effects of the regularization and awareness raising interventions.

**Table 7. Urban Site-Specific Evaluation, Nampula City Treatment and Control Unidades Comunal<sup>46</sup>**

Location		Treatment	Control
<b>Nampula city</b>	<b>BAIRROS</b>	<b>UNIDADE COMUNAL</b>	
	Muhala – Sede	25 de Junho	7 de Abril Eduardo Mondlane Josina Machel Paulo Samuel Kankomba
	Namutequeliua	Amicar Cabral Mutomote Mirian Nguabi	Namalate
	Muahivire	Elipisse Muetaze* Reno Muacothaia* Muengane Mutotope Namuato* Nanuco*	Gorongozza Mucuache
	Mutauanha		25 de Setembro 7 de Setembro Eduardo Mondlane Muthita Piloto
	Mutala		Cossole Minicane Muralene Namavo Napala

**\*Partial Coverage**

**Table 8. Urban Site-Specific Evaluation, Monapo Vila Treatment Bairros<sup>47</sup>**

Location	Treatment	
<b>Monapo vila</b>	Mucaca Mecutane Topelane Moajem Boa Viajem Metropime	Mulotine Nachicuva Naheruque Micolene Nova Cumba

<sup>46</sup> The unit of observation for the urban site-specific evaluation is the household. In Nampula city matching is planned at the household level. Originally bairro boundaries were expected to define the scope of the treatment (Muatala, Muhala – Sede, Mutauanha, Namutequeliua) and control (Muahivire) areas for households. However, intervention in Nampula city was rolled out at the sub-level of the Unidade Comunal, rather than the bairro level causing a change in the intervention unit accordingly.

<sup>47</sup> The unit of observation for the urban site-specific evaluation is the household. In Manopa vila matching was planned at the household, rather than bairro, level with bairro boundaries being used to define the scope of the treatment and control areas. However, by the end of the program, the five bairros originally designed as control (Mulotine, Nachicuva, Naheruque, Micolene, Nova Cuamba) were also treated. Therefore no comparison bairros exist in Manopa vila.

### 3.5.8 Urban Site-Specific Evaluation – Data Sources

Below we provide additional description of the quantitative and qualitative data sources for the Urban Site-Specific Evaluation. All instruments will be adapted or developed in consultation with MCC and local stakeholders when this follow-up evaluation enters the option period in summer 2019. Please refer to Annex 6.2 for a detailed mapping of data sources and indicators.

#### 3.5.8.1 Quantitative Data Sources

- **Household Surveys.** As part of the Urban Site-Specific Evaluation, three distinct survey efforts will be conducted, as described below.
  - **Nampula city:** The Nampula city household panel survey will be the primary data source for measuring Land Project impacts. The endline survey will generally rely on the baseline survey, but with a few additions to improve the outcome measures, such as survey experiments, and removal of questions where we lack variation. We propose including survey experiments to assess certain outcomes – such as informal transfers, conflicts and gender equality – and other sensitive or hard to measure outcomes.
  - **Monapo vila:** We propose continuing the household panel approach in Monapo vila as part of a rigorous performance evaluation pre-post survey. However, we propose a significantly revised household survey in Monapo vila to address questions of interest for performance outcomes; this will be based on the baseline household instrument which will be focused on performance outcomes with embedded survey experiments and open-ended text questions to collect additional context where needed. We will revise the baseline instrument to move away from agricultural productivity and nuanced livelihood impact measures and focus on the performance outcomes and mechanisms described above. This will be a structured survey but with the inclusion of a few open-ended qualitative questions.
  - **Wives’ survey:** We will conduct a survey with approximately one thousand wives across Nampula City and Monapo Vila. In cases where there is a male head of households, a separate wives’ survey will be directed to the wife (or first wife in polygamous households). The module will replicate many of the same household survey questions for key outcomes and include new modules to investigate women’s experience with local land governance, land conflict, engagement with land markets, etc.
- **Land Administrative data.** For the Urban Site Evaluation, our proposed endline sample is the universe of DUAT certificate land records from Nampula city and Monapo vila. The years of direct implementation (2012-2014) will be included in the performance evaluation but excluded from the impact analysis, which will focus on 2015-2019. We will request (or digitize) the complete record for each DUAT certificate, including all data on subsequent transactions and/or conflict records. Where records are not already available in the SIGIT system, this will require scanning and digitizing information that is not currently in SIGIT or an electronic format.
- **Community Leader survey.** We propose up to 3 structured surveys with traditional authorities/elders in five treatment and control bairros in Nampula City, as well as eight treatment bairros in Monapo Vila. To address questions regarding spillover, Community Leader surveys will also be fielded in one non-project bairro bordering treatment bairro (totaling 5 bairros).

- **Satellite data.** To examine property investments and service delivery outcomes, the evaluation proposes to use high-resolution pre-processed day and night satellite imagery of the Nampula city and Monapo vila hotspots. This data will be used to examine visible property investment change over time and increased access to electricity.
- **Geospatial data.** We will collect and review secondary geospatial data on relevant proxies, including population size; location of land-based investment projects; distance to tourist sites; land quality measures; and mineral/gas/forest distances. We will use this data to generate proxies for various contextual indicators – such as population and investment pressures to include in the descriptive analysis and regression analysis. This will enable us to better understand contextual factors and measure the heterogeneity of treatment impacts, including how market and population pressures mitigate the program effects.
- **Other government/administrative data.** The evaluation will also collect other administrative data to inform the performance analysis. Depending on availability and institutional willingness to share information, we will compile secondary data from sources, such as banking and financial data on collateralized loans, revenue data on land taxes and these funding streams for public service provision. In particular, we aim to collect time trend data on municipal budgets, bank and micro-finance information, tax collection and service delivery indicators for Nampula city and Monapo vila. If available and accessible, we will also request notary and *Registo Predial* data to determine property investments and land valuation. We will request data going back to 2008/2009 through 2019.
- **Other secondary data.** The evaluation will also rely on M&E data and project reports from implementing partners.

### 3.5.8.2 Qualitative Data Sources

- **Open-ended Stakeholder KIIs.** For grounding the household results, we will use findings from KIIs with Nampula city and Monapo vila municipal land offices. Open-ended KIIs will be conducted with Municipal Office Directors. We will conduct KIIs with mayors in Nampula City and Monapo vila. KIIs in Nampula City and Monapo Vila with investors (where relevant), banks or micro-finance institutions, as well as notaries and the *Registo Predial* will allow the evaluation team to better understand local land administration, land markets and the lending environment. We will use this data to contextualize the results obtained through the household survey and provide insights into the incentives and dynamics of various stakeholders and institutional beneficiaries.
- **Structured land administration official KIIs.** Structured KIIs will be conducted with SIGIT technicians in Nampula City, and database technicians in Monapo Vila, in addition to any staff tasked with managing the conflict office or registry.
- **FGDs.** Focus group discussions will be conducted in four bairros in Nampula city (two treatment, two control) and two of the original treatment bairros from Monapo municipality to address outcomes and context that are not available from other sources. Our groups of interest include women above 35, women below 30, men above 35, men below 30, elders and leaders responsible for dispute resolution, residents in informal settlements, local business owners, households engaged in credit-taking, as well as households engaged in rental markets. To address questions regarding spillover, FGDs will also be fielded in five non-project bairro bordering five treatment bairros.

### 3.6 Revised Power Calculations

SI recalculated the minimum detectable effect size (MDES) through a power analysis to determine whether there are programmatically significant impacts that the evaluation will not be able to detect. The MDES is defined as the smallest impact the study could identify with a significance of .05 and 80 percent power. We estimate the MDES for outcomes aggregated to the household level using Stata 15. We use a multi-level cluster design to account for the fact that treatment was administered at the neighborhood level.

Overall, we find that the study is sufficiently powered to detect moderate program effects, in line with the expected impact of the Land Project. SI used the following parameters for power calculations<sup>48</sup>:

- $\alpha = 0.05$  — probability of a false positive (Type I) error
- Power  $(1-\beta) = 0.8$  — power to detect an effect if one truly exists
- $\rho$  — intra-cluster correlation (ICC); calculated for each variable
- $j$  — number of clusters,
- $m$  — average cluster size,
- $\mu$  — mu, baseline mean value; calculated for each variable
- $\sigma$  — sigma, standard deviation; calculated for each continuous variable

Beyond MSU’s original design, we also expanded the set of outcome indicators examined by the power analysis and show the percentage change detectable by the evaluation above the baseline mean. This additional information on relative percent change will reduce the chance that policymakers erroneously conclude the intervention failed on the basis of statistical significance alone.

For Nampula City, Malema district, and Mecufi district baseline household samples, Table 9, Table 10, and Table 11 present the indicators, baseline values, ICCs, MDES, and the equivalent effect relative to the original metric of the outcome. The ICCs were re-calculated for each of the outcome variables assessed baseline means. This was to ensure the study had sufficient power to detect policy-relevant program impacts where they existed, given variability around responses and actual ICCs obtained.<sup>49</sup>

For Nampula City, depending on the indicator, we find that the study will be able to detect a wide range of effects from 5-40%, with most effects detectable around ten percent. As Table 9 shows, the study is generally powered to see changes at a policy relevant level at or below MCC’s expected economic rate of return of 24.8% for the Land Project; in terms of knowledge (8%), gender (7%), conflict (8-13%), credit (5%) and investments (9-13%). Service delivery outcomes are only powered to detect larger effects closer to 20%. The study is underpowered to detect anything beyond substantial changes in income (42%) and expenditures, but we will be able to determine whether the Land Project had an impact on important livelihood proxies, such as improvements in nutrition and increases in non-farm employment.

For the Malema and Mecufi rural site-specific impact evaluation, the study is powered to detect effects in the 10-43% range for Malema and from 6-36% for the Mecufi study area. The Malema study has less power than the Nampula urban hotspot impact analysis. As Table 10 for Malema shows, the study is generally powered to see changes at a policy relevant level for MCC, including knowledge (15%), gender

<sup>48</sup> SI used Stata 15 to calculate MDES using the `-power-` command (`power twomeans` and `power twoproportions`, depending on whether the outcome is continuous or binary). SI used the `-loneaway-` command to calculate ICC for each variable. The average cluster size for each site included: In Nampula city, 34 households per treatment cluster (12 clusters), 23 households per control cluster (21 clusters); in Mecufi district, 152 households per treatment cluster (3 clusters), 63 households per control cluster (4 clusters); and in Malema district, 27 households per treatment cluster (15 clusters), and 53 households per control cluster (6 clusters).

<sup>49</sup> Higher ICC and larger standard deviations produce larger MDES, all else equal.

MCC Mozambique Land Tenure Services Project – Endline EDR (15-22%), conflict and perception of tenure (11-22%), and investments (10-24%). The evaluation is underpowered to detect anything in Malema beyond substantial changes in income (43%) and expenditures (26%).

Table 11 for Mecufi district shows that the evaluation is generally powered to see changes at a policy relevant level for MCC, including knowledge (9%), gender (8%), conflict (12-15%), and investments (10-19%). Beyond very large program effects, the evaluation is underpowered to detect changes in income (32%), expenditures (34%) and service delivery (36%).

**Table 9. Revised Power Calculations for Nampula City (Urban Site-Specific Impact Evaluation)**

Nampula City		Control			Treatment					
General topic	Outcome variable	Mean	s.d.	n <sub>c</sub>	Mean	s.d.	n <sub>t</sub>	ICC	Delta (MDES)	Change over baseline
	HH income less outlier (meticaís)	18053.19	40732.56	370	23587.13	46291.18	319	0.01	9145.96	39%
<b>Livelihoods</b>	Non-food expenditures (meticaís)	2164.93	2598.08	478	2573.73	5496.77	403	0.02	1072.56	42%
	Salaried work	0.51		478	0.53		403	0.01	0.10	10%
	Diversity Diet Score	8.97	1.65	478	9.31	1.55	403	0.23	0.81	9%
<b>Service delivery</b>	Electricity on parcel	0.45	0.44	478	0.48	0.42	403	0.17	0.19	19%
<b>Conflict and Perception of Tenure</b>	Probability of conflict (parcel level)	0.26		477	0.28		403	0.00	0.08	8%
	DUAT certificate make disputes more/less likely	0.32		478	0.40		403	0.02	0.11	11%
	DUAT certificate will make dispute resolution more/less likely	0.79		478	0.78		403	0.10	0.13	13%
	Probability of losing parcel to conflict (parcel) level	0.24		478	0.26		403	0.01	0.09	9%
<b>Investment</b>	Investment in Land (y/n) in past 12 months)	0.26		478	0.29		403	0.03	0.11	11%
	Buildings on ALL parcels	1.65	0.90	478	1.67	0.89	403	0.02	0.21	13%
	More willing to construct with DUAT certificate	0.86		478	0.89		403	0.06	0.09	9%
	HH rents out any parcels	0.06		478	0.08		403	0.00	0.05	5%
<b>Credit and rental markets</b>	Receive credit in past 12 months	0.08		478	0.07		402	0.00	0.05	5%
<b>Knowledge – women’s land rights</b>	Women have right to maintain a piece of their ex-husband’s land in divorce	0.81		478	0.84		403	0.00	0.07	7%
<b>Knowledge – land rights (1997 law)</b>	Informed on 1997 law	0.13		478	0.15		403	0.02	0.08	8%



**Table 10. Revised Power Calculations for Malema District (Rural Site-Specific Impact Evaluation)**

Malema district		Control			Treatment					
General topic	Outcome variable	Mean	s.d.	n <sub>c</sub>	Mean	s.d.	n <sub>t</sub>	ICC	Delta (MDES)	Change over baseline
	Total HH Income (meticaís)	20212.62	37420.96	316	19326.80	29416.70	395	0.01	8264.19	43%
<b>Livelihoods</b>	Total HH expenditure (meticaís)	2460.72	1852.19	316	2159.43	1667.32	395	0.03	572.11	26%
<b>Conflict</b>	Probability of conflict (parcel level)	0.11		311	0.14		387	0.03	0.11	11%
	DUAT certificate make disputes more/less likely	0.45		316	0.44		395	0.09	0.22	22%
	DUAT certificate will make dispute resolution more/less likely	0.85		316	0.81		395	0.05	0.11	11%
<b>Investment</b>	Chemical Fertilizer	0.68		316	0.41		395	0.15	0.21	21%
	Use of improved seed	0.12		316	0.14		395	0.02	0.10	10%
	More willing to construct with DUAT certificate	0.83		316	0.87		395	0.04	0.11	11%
	Pesticides	0.47		316	0.25		395	0.11	0.24	24%
	Use of improved seed	0.12		316	0.14		395	0.02	0.10	10%
	Investment in Land (y/n) in past 12 months)	0.29		316	0.39		395	0.05	0.18	18%
<b>Rentals</b>	More willing to rent with DUAT certificate	0.47		316	0.44		395	0.06	0.19	19%
	Buildings on ALL parcels	1.83	0.84	316	1.94	1.23	395	0.04	0.34	17%
<b>Knowledge – women’s land rights</b>	Women have right to inherit	0.75		316	0.72		395	0.05	0.14	14%
	Women have right to maintain a piece of their ex-husband’s land in divorce	0.62		316	0.63		395	0.12	0.22	22%
	Women have right to formal land title	0.71		316	0.67		395	0.14	0.20	20%
<b>Knowledge – land rights (1997 law)</b>	Informed on 1997 law	0.16		316	0.23		395	0.05	0.15	15%

**Table 11. Revised Power Calculations for Mecufi District (Rural Site-Specific Impact Evaluation)**

Mecufi district		Control			Treatment					
General topic	Outcome variable	Mean	s.d.	n <sub>c</sub>	Mean	s.d.	n <sub>t</sub>	ICC	Delta (MDES)	Change over baseline
	Total HH Income (meticaís)	30656.89	44857.10	251	33736.46	60179.91	455	0.00	10947.63	32%
<b>Livelihoods</b>	Total HH expenditure (meticaís)	4550.66	3420.95	251	4533.44	5159.67	455	0.05	1535.61	34%
<b>Service delivery</b>	Mobile phone network on parcel	0.58	0.35	251	0.32	0.38	455	0.52	0.36	36%
<b>Investment</b>	Buildings on ALL parcels	1.58	1.15	251	1.57	1.72	455	0.00	0.30	19%
	Investment in Land (y/n) in past 12 months)	0.09		251	0.16		455	0.07	0.16	16%
	More willing to construct with DUAT certificate	0.69		251	0.73		455	0.01	0.10	10%
<b>Credit and Rental Markets</b>	Receive credit in past 12 months	0.06		251	0.05		455	0.00	0.06	6%
	More willing to rent with DUAT certificate	0.48		251	0.59		455	0.01	0.13	13%
<b>Conflict</b>	DUAT certificate make disputes more/less likely	0.37		251	0.42		455	0.01	0.12	12%
	Probability of conflict (parcel level)	0.19		240	0.20		428	0.04	0.15	15%
	DUAT certificate will make dispute resolution more/less likely	0.68		251	0.67		455	0.02	0.12	12%
<b>Knowledge – women’s land rights</b>	Women have right to maintain land in divorce	0.90		251	0.87		455	0.04	0.08	8%
	Women have right to formal land title	0.81		251	0.87		455	0.01	0.08	8%
<b>Knowledge – land rights (1997 law)</b>	Informed on 1997 law	0.22		251	0.22		455	0.00	0.09	9%

### 3.7 Data Collection Timeline

The majority of our quantitative and qualitative data sources requires field-based data collection including the panel household surveys, wives' survey, collection and digitization of land administrative data, KIIs, FGDs, and direct observation of land offices and equipment. In addition to these, there is likely a need for in-person efforts to successfully fill requests for desired secondary data from banks, notaries, planning and revenue departments and the *Registo Predial*. Regarding the latter, the evaluation team will document efforts to secure information keeping relevant parties from MCC on copy to these requests and may seek MCC support if significant barriers are encountered.

The endline data collection will occur in three stages. Phase I will include comprehensive rural data collection between November 6, 2019 and February 8, 2020 for all the field based quantitative data sources listed above. FGDs will take place in Malema because of the constraints around the World Bank project, which will begin implementation in early March 2020. From November 6 to January 15, quantitative data collection will take place in Malema. This will occur concurrently with Mecufi quantitative data collection, which will extend to February 8, 2020. Phase 2 includes urban quantitative data collection will take place from January 16 to March 13, 2020 in all urban areas. Phase 3 includes FGDs in Mecufi and urban areas.

To the extent possible, the timing of the household panel survey is designed to coincide with the original timeframe of the baseline household survey to control for seasonal variation. Baselines for Nampula city and Monapo vila occurred in October through December and Mecufi in September.

The exception to this seasonal alignment is Malema district. There, the data collection timeline for the endline household survey is motivated by pressure to collect endline data before control areas are contaminated by the World Bank's Sustenta project. Sustenta will conduct regularization in the Malema hotspot control areas along farmer value chains. MCC and the World Bank have negotiated an agreement to postpone World Bank implementation to enable the completion of endline data in Malema in by October 2019 and the World Bank confirmed additional delays to March 2020. This will primarily affect the seasonality of the Malema household survey, which was implemented in May during baseline but will be implemented in November-December for endline. This may also affect the quality of the citizen FGDs in Malema, as a November-December implementation timeline will not enable the development and revisions of FGDs based on analysis of quantitative data.

Data collection for administrative land records will continue across the municipalities and districts starting from March 6 through April 2020; this is critical to capture SIGIT and other electronic and paper records in the municipalities, as well as any electronic and paper records from districts and SPGCs that are not available from DINAT's central SIGIT database. Across municipalities, SPGC offices, and district land offices, land administrative data will be obtained through two means. First, in offices with a functioning SIGIT system or electronic records, the evaluation team will conduct an export of the SIGIT transaction data and download any relevant electronic databases and records. Second, for land offices without a functioning SIGIT system and/or land transaction and conflict data that is only available in paper records, SI's data collection firm (Forcier) will digitize relevant data for 2015-2018. Forcier will either accomplish this through scanning and digitizing or through a direct electronic entry system with a percentage of back-up scans for quality control – the final process will be determined in the early planning stages of the Option Period based on a pilot of the two approaches for efficiency and ease of implementation between SI and Forcier.

As part of Phase I, members of the SI evaluation team will travel to Maputo and Nampula in October-November 2019 to train and launch the field teams, and conduct some of the KIIs. The training will consist of an 8-day quantitative training for enumerators with the first two days for supervisor/ trainer training. The last day will be a one-day pilot. The qualitative training will be led by the Land Administration Expert and last 2 days with a 1 day pilot. The ISA training will include 2 days of training of trainers, led by the Evaluation Expert, followed by 3 days of training and a 1 day pilot. The evaluation team will accompany the local data collection firm at the outset of their field work and ensure proper application of the tools and adherence to data quality standards.

In addition, dependent upon MCC approval the evaluation team will work with the SIGIT specialist at the central Database Software Division of DINAT to export all transactions for the Northern Province SPGCs stored in the central databased from years 2012 to the present.

Phase 1 data collection faces the following constraints:

1. The World Bank will begin operations in March 2020 in Malema; therefore, data collection must take place prior to March.
2. Elections will take place October 15, 2019. Data collection cannot take place during the 2 weeks around the election. Training is allowed to begin on October 21. Local stakeholders do not anticipate issues from the election that could result in a delay of data collection.

Phase 2 consists of urban data collection of all quantitative instruments as well as open-ended KIIs and the LAU KIIs and digitization.

As part of Phase 2, the SI evaluation team will travel to Nampula to conduct quantitative training on the urban instruments to the enumerator team that is conducting the Malema quantitative surveys. Additionally, the SI evaluation team will train the trainers on the open-ended KIIs and train the lead researchers on the LAU KIIs.

Phase 3 consists of FGDs in Mecufi, if possible, and urban locations. The FGD tools will be updated and informed by the Malema FGDs that took place in November 2019 as well as the preliminary findings from the quantitative data. As part of this phase, the SI evaluation expert will travel to Mozambique to train the researchers on the tools in early March 2020. The FGDs will be completed immediately after training.

We apply this staggered approach for four reasons. First, this ensures the completion of data collection in Malema prior to the launch of the World Bank’s Sustenta project in Malema in March 2020. Second, it will enable the team to hold to the season that baseline household data was collected, with the exception of Malema. Third, it will provide time for preliminary analysis of household and land administrative data, as well as the FGDs from Malema, to inform updates to the FGD protocols for Phase 3. As such, the phased approach will enable us to ground truth and better explain and interpret quantitative findings.

**Table 12. Data Collection Timeline**

	Jun '19	Jul '19	Aug '19	Sep '19	Oct '19	Nov '19	Dec '19	Jan '20	Feb '20	Mar '20	Apr '20	May '20	Jun '20
<b>Fieldwork preparations</b>													
<b>PHASE 1</b>													



programming, and before enumerator training. The survey firm will be able to download the survey on their devices for further desk-testing. Adjustments to the survey tool and programming will be made during enumerator training, pre-testing, and piloting to improve and finalize the logic, constraints, and any other aspect of the programming. These quantitative surveys will be programmed in Portuguese and English.

Our local data collection partner, Forcier, will be responsible for translating survey instruments, protocols and training materials into Portuguese. Professional translators will be enlisted to conduct the translations, including one party to conduct forward-translations using the original English, and another to conduct back-translations from Portuguese back to English, without access to the original English. SI will review and work with Forcier to reconcile any adjustments needed based on the back-translations. A pre-test is typically conducted following translation and before training to check the flow and duration of the tool, as well as catch any additional issues with translation.

Comprehensive training is also an important part of error prevention. Prior to enumerator training, SI ensures field presence to conduct a supervisor/ trainer training to ensure all local partner staff have an in-depth understanding of the study objectives and all data collection tools. Following this, the enumerator training is completed, with SI presence as well. The training is led by key data collection firm personnel, including the Team Leader and Field Manager, with support from Field Coordinators and Supervisors as relevant. This training will include instruction on administering in-person surveys, ethical and professional behavior in the field, using SurveyCTO, and a question-by-question review of all instruments that will be administered as part of the survey effort. SI works with local partners to design written exams as part of trainings to assess enumerators' understanding of the material. Further, all interviewers are observed by Supervisors or Field Coordinators during a pilot, to ensure they administer the informed consent and survey questions appropriately, act professionally and ethically in the field, and are otherwise prepared to carry out the assignment. SI leads key pieces of the training including background to the study, parts of the ethical behavior module, and substantive inputs to the question-by-question walk-through.

Training concludes with a pilot where each enumerator completes at least 2-3 surveys, and following this feedback is provided on ways strengthen the instruments and maximize their relevance to the local context—for example through the addition of locally relevant response categories on the survey, or ensuring appropriate terminology is used. Feedback is also given to enumerators on ways to improve administration of the survey, establishing rapport with respondents, etc.

The second prong, field-based monitoring, is comprised of various standards, tools, templates, and quality standards that SI enforces with its local partners to ensure that data is comprehensively monitored during fieldwork to make sure that any issues can be raised and addressed while teams are still in the field. For example, SI mandates that interviewers' work is checked on a nightly basis before the forms are uploaded to the server. For this reason, SI enforces an enumerator/supervisor ratio of no more than 5 to 1. In addition, SI mandates that, depending on the survey effort and total sample size, 5-10% of surveys are observed directly by supervisors and documented using an accompaniment form, 2-5% are co-enumerated using an identical form and then checked using Stata's *bcstats* command, and 5-10% are back-checked either in person or by phone and then checked using Stata's *bcstats* command. Back-checks include both a random sample of the interviews as well as a targeted sample of interviews on the basis of any data quality issues such as any single interviewer with too many refusals or 'don't know' responses. Further, SI collaborates with its own local coordinator to ensure an independent field presence for surprise drop-ins and observation of interviews during the duration of data collection.

The third prong of data quality is independent quality monitoring, which is conducted by SI from HQ for the duration of data collection. Once data collection is underway, field teams must upload quantitative data to a shared server daily. Using this data, SI adapts a high-frequency quality check Stata .do file and runs on 100% of the data, twice-weekly at the start and once-weekly thereafter a set of standard checks to monitor progress, interview duration, problematic response patterns, outliers, and other issues – these are fed back using standard templates to the local firm for reconciliation. Data is not considered accepted until all quality checks are fully reconciled. SI may also monitor other back-end quality control measures such as audio audits programmed into the survey tool (e.g. audios of the consent being administered), or speed limits (to catch any instance where interviewers are speeding too quickly through the tool).

### 3.8.1.1 Qualitative

Qualitative enumerators will receive a four-day training on best practices for FGDs and KIIs with local community leaders, including exercises in managing the discussion, probing for details, the unique ethical challenges of confidentiality and informed consent in a focus group setting, qualitative data management and transcription guidelines. In addition, they will be trained on the substantive subject issues of the qualitative data collection to strengthen the depth and quality of information they collect. Enumerators will conduct all FGDs in pairs, where one enumerator leads the discussion and the second assists and takes notes. Qualitative data collection with women will be led by women. SI evaluation team members will ensure presence in the field for training of qualitative staff and will participate substantively in the training preparations and manual development with Forcier.

Guides will be provided to Forcier for FGDs and KIIs they would lead. These guidelines specify the formatting and conventions to be used in all transcriptions and translations, ensuring that transcription is always undertaken as a word-for-word written record of exactly what was said by participants and that all transcripts can quickly be redacted of identifying information. SI will employ and customize its templates that incorporate best practice for verbatim transcription and FGD summaries.

Professional translators will conduct translations from Portuguese verbatim transcription to English transcripts. Forcier will submit one sample transcription and one sample translation of the qualitative data to the evaluation team for comment and approval to ensure compliance with the transcription and translation guidelines. This quality control check is critical for ensuring that transcriptions and translations are of a standardized high quality. SI staff will comprehensively note and questions, clarifications, or unclear portions of transcripts and return questions in a standard template to Forcier. Transcripts will be considered complete only once these questions are fully reconciled. Further, qualitative FGDs and KIIs will be audio-recorded (provided consent from respondents and participants), to ensure that any questions on the transcripts can be cross-checked with a recording.

## 3.9 Data Analysis

### 3.9.1 Quantitative

#### *Quantitative*

The quantitative data will be subject to two types of analysis. First, indicators for the impact analysis will be analyzed through multivariate regressions. For any performance outcomes or relevant contextual analysis that is supported by quantitative data, we will present descriptive statistics and basic statistical tests of treatment versus control (where applicable).

Institutional Strengthening Evaluation:

For the Institutional Strengthening Evaluation identification strategy, we propose a DID approach to determine the causal effect of the Land Project on the impact indicators of interest. Equation 1 below will be used to identify the effects of institutional strengthening:

$$Y_{ij} = \alpha + \beta T_j + \gamma t + \delta(T_{ij} * t) + \rho X_i + \varepsilon_{ij} \quad (XX),$$

Equation 1

Where, subscript i indicates a district or municipality, and j is a DUAT certificate observation.  $T_i$  is the treatment dummy variable distinguishing treatment and control units and  $t$  is a vector of time dummies for different years.  $X_i$  is a vector of district/municipality or parcel level control variables including parcel size, main parcel use<sup>51</sup>, and gender of the DUAT certificate holder.  $\beta$  captures the regional difference between the treatment and control districts/municipalities,  $\gamma$  captures the common time trend effects over time in all districts/municipalities, and  $\delta$  is the vector for our outcomes of interest measuring the impact of institutional strengthening program (e.g. , transaction time, number of transactions, etc.). The error term is represented by  $\varepsilon_{ij}$  and is assumed to be normally distributed with mean zero.

Beyond the impact analysis, we will conduct a project and post project times trends analysis of available land administration indicators from 2012-2019 in the matched treatment and control districts and municipalities.

Urban and Rural Site-Specific Evaluations:

For the Urban and Rural Site-Specific Evaluations, we propose a DID approach with matching and household fixed effects to identify the impacts of the Land Project treatment. The general frame of the DID estimator with panel data and fixed effects model is:

$$Y_{it} = \beta_1 Time_t + \beta_2 Treatment_{it} + \eta_i + e_{it},$$

Equation 2

where Y is the outcome of interest at time  $t$  for household  $i$  and  $\eta_i$  are household-level fixed effects. The constant  $\beta_2$  is the estimate of the treatment effect. Cluster robust standard errors will be used, by aldeia/bairro, to account for serial correlation in responses across households within the same village. Robust standard errors ( $e_{it}$ ) will be clustered at the *aldeia/bairro* level, using Huber-White sandwiched standard errors.<sup>52</sup>

The DID approach controls for time invariant differences between treatment and control groups; this includes unobserved characteristics and those which have not been taken into account through the matching proposed below.

*Matching to mitigate balance problems*

Matching techniques essentially aim to mimic a randomized experiment by ensuring that the treatment and control groups have similar distributions in observed characteristics.<sup>53</sup> The aim of preprocessing with matching and reweighting is to improve the covariate balance between treatment and control groups.

<sup>51</sup> For municipalities, the available categories include residence, commerce, industry, social/religion, public services & commerce. For SPGCs, the relevant categories include agricultural production (annual & perennial crops), forest plantations, livestock production (cattle & others), public services, commerce & industry, residence, tourism, social & religion, crop-livestock production, and community.

<sup>52</sup> Lin, 2013

<sup>53</sup> Hainmueller, 2012

However, unlike randomized experiments, matching relies on the assumption of selection on observables—that all of the relevant variables used to assign treatment are included in the matching.<sup>54</sup>

During the option period, we propose comparing three different techniques for matching and reweighting observations to improve balance. First, we will use propensity score with matching, with weighting based on the Mahalanobis distance metric. Propensity score matching pairs treatment to control observations based on the estimated probability of assignment to treatment (in this case, receiving a systematic DUAT certificate). Logistic regression is used to estimate the propensity score, which is used to match treated and control households. Unmatched control observations are then discarded from the analysis. Finally, the observations are reweighted using the Mahalanobis distance metric. Combining the Mahalanobis metric with propensity score matching has been found to have preferable qualities to using propensity score matching alone.<sup>55</sup>

Second, we will use propensity score matching, with reweighting via a genetic algorithm.<sup>56</sup> This technique also matches based on the propensity score, but it uses an evolutionary search algorithm rather than the Mahalanobis distance metric to find weights for each covariate that optimizes covariate balance. Genetic matching often finds better balance than propensity score matching, and the estimations are typically less biased than those obtained via propensity score matching alone.<sup>57</sup>

Third, we will employ entropy balancing, a technique for preprocessing data which reweights observations without matching.<sup>58</sup> As with matching, the user specifies a set of covariates which form the basis for a reweighting scheme. An entropy balancing algorithm then finds weights for observations in the control group, and no matching or discarding of observations occurs. Entropy balancing reweights household observations in the control group to achieve balance across treatment and control groups on outcome indicators of interest. Following best practices, the matching procedure which yielded the best reduction in bias across the most important covariates will be selected for subsequent use in the matching approach.<sup>59</sup>

### **Heterogeneous Treatment Effects:**

Understanding whether and how program impacts vary across a set of population and relevant context factors contributes to more effective programming decisions for future implementation. Based on the program theory and literature, we expect to find variation in the treatment effect across a number of subgroups. Where sample size permits, outcomes will be tested for heterogeneous treatment effects across a number of household subgroups. This includes the following:

- Gender of household head
- Household baseline wealth status (asset-based wealth index; lowest quartile vs. others);
- Household baseline landholding (continuous, and land-constrained vs. others);
- Age of household head at baseline (continuous, and under 35 vs. others);

To test for heterogeneous treatment effects across these subgroups, we estimate the following equation:

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<sup>54</sup> In most observational studies, this assumption is implausible because the process used to assign treatment is unknown. Fortunately, we have some documentation of the process used by program implementers to select communities for the program at the *aldeia/bairro* level.

<sup>55</sup> Rosenbaum and Rubin, 1985

<sup>56</sup> Diamond and Sekhon, 2013

<sup>57</sup> Diamond and Sekhon, 2013

<sup>58</sup> Hainmueller, 2012

<sup>59</sup> Austin, 2009

$$Y_{it} = \beta_1 Time_{it} + \beta_2 Treatment_{it} + \beta_3 Treatment_{it} * Het_{it} + \beta_4 Het_{it} + \eta_i + e_{it}$$

Equation 3

$Het_{it}$  is the indicator variable for the subgroup of interest. It is the marginal increase in treatment effect in aldeias/bairros in the subgroup under evaluation. All other parameters are the same as those described above for equation 1a.

For each of these groups of interest, separate panel DIDs with fixed effects will be conducted for each subgroup, and a z-score will be constructed from the difference in impact estimates for each group. The z-score can be interpreted as the number of standard deviations by which the effect sizes differ for the two subgroups. A difference of more than two standard deviations indicates that the difference in mean treatment across the two-group effect is not likely to be due to chance. This is interpreted as support for a significant difference in treatment effect between the two groups (for example, between impacts for female and male-headed households).

### Multiple testing correction

Given the number of outcomes that we will test in the evaluation, we expect to find false positives in our results. As such, our evaluation results will report both uncorrected p-values and corrected p-values using the Benjamini & Hochberg (1995) False Discovery Rate Correction. Our main findings and summary sections will rely on the uncorrected values, because we are analyzing a number of closely related interdependent outcomes and, therefore, the standard corrections for the false discovery rate are likely too conservative.<sup>60</sup>

### Spillover

There are a number of techniques for estimating the Average Treatment Effect (ATE) in the presence of spillovers.<sup>61</sup> However, these require significant assumptions about how spillover works. Specific survey questions will be included in the household panel surveys, local leader KIIs with traditional authorities and community leaders, as well as focus group discussions to measure the likelihood and/or extent of spillover and qualitative data might be used to assess spillover. If we determine that spillover is a serious problem, we will use inverse propensity score weighting to calculate an ATE.<sup>62</sup>

### 3.9.2 Qualitative Analysis

As described above, FGDs and open-ended KIIs will be audio recorded on digital voice recorders, transcribed and then translated (if not conducted in English). Qualitative data transcription will be undertaken by the same researchers who conducted the discussion or interview, as soon as possible after the discussion or interview takes place. This practice ensures the full and seamless integration of additional context information and inaudible information (body language, etc.) into the transcript. The qualitative researchers leading the interview or FGD will transcribe the audio recording into Portuguese within seven days. This transcription is then translated into English, back translated, and corrected before a final translation from Portuguese to English.

<sup>60</sup> Gelman and his co-authors note here that for most social science studies, where the effects may be small but are unlikely to be exactly zero, the corrections are likely too conservative. Gelman, et al. 2012

<sup>61</sup> Aronow and Samii, 2015; Athey and Imbens, 2016

<sup>62</sup> Aronow and Samii, 2015

Analysis will involve reading and re-reading the transcripts and carefully coding and analyzing data according to queries that are designed to correspond directly to the evaluation questions for this evaluation, as well as subgroup analyses. The team will first develop a codebook of approximately 30 codes, following best practice to allow for granular analysis without over-crowding the number of codes. The team’s evaluation specialist and land administration specialist will ultimately approve the final codebook. Then, at least two evaluation team members will be trained to code the qualitative data. This will first involve a comprehensive training on the codebook itself, to ensure understanding of key terms and differentiation between codes. Then, each team members assigned as a “coder” will code the same 2 transcripts in their entirety, along with one of the senior members of the team. The team members will then reconvene to assess inter-coder reliability, resolve any questions, and if needed, refine and finalize the codebook.

Thematic coding will be conducted using Atlas.ti software, which allows for individual work on sub-sets of transcripts that can then be merged into a master project, for conducting analysis of patterns, code co-occurrence matrices, extract quotes, and run other custom queries to supplement the quantitative findings. Quotations will be selected from the transcripts to illustrate the findings with simple, focused pieces of information representing key themes. SI has extensive experience in qualitative coding and will apply best practices in coding, running queries, and compiling qualitative results and integrating them with quantitative so as to maximize the value-add of the qualitative data collection for this evaluation.

### 3.10 Revising the Economic Rate of Return (ERR)

At project closing, the ERR for the Land Project was estimated at 24.8%. This was based on a consolidated model that combined economic benefits derived from the issuance of DUAT certificates to urban and rural beneficiary households (increased land values) and business enterprises, community lands and producer associations (increased agricultural productivity and/or investments in farm equipment). This ERR analysis was developed at the end of Compact and estimates benefits from two income streams: 1) implicit income gains to households receiving DUAT certificates (for land in urban and rural hotspots) measured as increases in GDP, and 2) increased income from investments in agriculture lands for members of communities whose lands are delimited and from investments in production for producer associations whose land are demarcated. Benefits are included for communities and associations, as well as for urban and rural parcel-holders who are expected to receive a DUAT certificate under the program.

For the endline ERR, the team proposes reassessing the economic implications of property value appreciators and project benefits that are assumed to accrue from property value enhancements associated with the issuance of DUAT certificates.<sup>63</sup> Property values may indeed increase as a result of improved land administration services and strengthening tenure security. However, value increases (or property value appreciation) would not constitute economic benefits unless the properties in question are transacted, thereby conferring benefits to the owners in the form of earnings/income over and above the base values of the properties.<sup>64</sup> Additionally, the SI team will examine whether reduction in disputes

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<sup>63</sup> The close-out ERR indicates that according to the Urban Land Market Study of 2004, real estate prices for parcels in urban areas with a DUAT certificate increased by a multiple of 1.3 to 2.7. These rates actually correspond to an increase ranging from 30% to 170% percent. The mid-range multiplier of 1.8 was used in the analysis as the base case for urban parcels.

<sup>64</sup> Wealth increase does not necessary correspond to increased consumption levels/ capacity. Increased income can lead to immediate ability to increase consumption. When wealth is converted into cash or transacted on the market with a surplus over and

represents a major source of benefits as a result of reduced costs borne by landholders, disputing parties, and dispute resolution bodies, including the courts.

Social Impact proposes a three-pronged strategy to update and revise the project CBA using a more comprehensive set of measures of the project's benefits. We propose to:

- Establish of a sound counterfactual by utilizing the entire set of existing baseline and planned evaluation endline,
- Look beyond the DUAT certificate and consider possible improvements in land productivity and growth patterns in agricultural land use over the project's planning horizon of 20 years, and
- Investigate the project's impact in the rural and urban sectors separately, and then combine them in one consolidated package for the overall ERR estimation.

We propose to develop a sub-model for rural areas, to (a) use land areas (hectares) for the projections rather than the number of households which will certainly change throughout the planning horizon for the project (i.e., the 20 to 25 year span for the analysis), (b) factor in growth for the land areas under crops, (c) factor in the enhanced productivity associated with increased land investments and reduced land conflicts, and (d) correlate the analysis with the national measures.

We also propose to develop a sub-model for urban areas, (a) introduce the notion of immovable property (rather than just look at the DUAT certificates, which may mutate over time) and looking into the existing urban DUAT certificates to understand the number of vacant plots for which DUAT certificates have been issued in the urban and rural hotspots, rate of new housing development on the land, whether it is the owner occupying the property or whether it is a tenant, (b) review the market turnover rates (transactions) and study of constraints on the markets, and (c) factor in access to mortgages in terms of both residential mortgages and commercial credit backed by real property collateral.

The detailed data collection effort will involve sales and various other property transactions from the MCC hotspot study areas including leases, mortgages, changes in land use patterns (conversion of farmland into city land), new housing starts, commercial and industrial property development etc. The ERR would be rely on the rural and urban hotspot data sources enumerated above, in addition to national and regional statistics from INE.

### 3.11 Limitations, Risks, and Challenges

The critical design challenge faced by the Land Project impact evaluation is non-random program implementation. The intervention was targeted towards certain priority areas selected by HTSPE and GoM stakeholders. This non-random implementation of the program introduces potential selection bias, whereby areas targeted to receive the program may be more likely to have improved outcomes than areas that did not receive the program, due to differences in their underlying context. The distributions for key pre-treatment covariates suggests that the Land Project may have been implemented in places that were already, on average, doing better across certain indicators of household development outcomes, or better situated in terms of markets or potential agricultural investments. Indeed, baseline diagnostics suggest a clear imbalance across treatment and control groups on household characteristics

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above the initial value of the wealth assets, then we infer that the individual's wellbeing has been upgraded and economic benefits have been generated.

and outcomes of interest. While variation exists between geographic units, significantly, this includes imbalance across outcome indicators related to credit, perceived land value, and land amenities. There are clear differences between treatment and control households on key characteristics, including education of household head, household income sources, asset ownership and consumption.<sup>65</sup>

While this non-random implementation is understandable from a programming perspective, it does introduce additional challenges for rigorous estimation of program effects, as it is difficult to account for the full range of unobservable differences across treatment and control districts. When programs are implemented non-randomly, selection issues and unobserved endogeneity are likely to drive results unless they are explicitly addressed in the modeling.

As described above, we will employ techniques during analysis to mitigate confounding and improve balance between treatment and control observations. To accomplish this, the evaluation recommends a fixed-effects DID model to determine program impacts, coupled with a matching strategy to achieve better balance across the treatment and comparison groups. Matching can help mitigate potential confounding of the impact estimates from factors that reflect decisions about where to implement the program relative to where it was not implemented, and from household characteristics that could relate to potentially different levels of household ability to participate in knowledge/awareness raising as well as benefit from DUAT certificate registration.

However, as with all quasi-experimental DID designs, if there are unmeasured confounders which affect the treatment and comparison groups differently over the time frame of the evaluation, and also affect any of the outcomes, such confounders could result in biased estimates of program impacts for those outcomes.

There are also several challenges specific to the overall quality of the impact evaluation component for the Institutional Strengthening Evaluation. First, there are no controls for assessing the impact of the SIGIT system for rural land administration, therefore, the Institutional Strengthening evaluation will only assess impacts associated with professional development capacity and facility upgrading. Second, there are a limited number of baseline outcomes indicators available for the land administrative data. These include: (1) the total number of DUAT certificates issued, (2) the time taken to process a DUAT certificate (from application to issuance), and (3) the number of land transfers (proxied for by time of each land transfer). This is important because without dates on the initiation and completion of land transactions, we cannot measure the efficiency of these, as requested for EQ2. Moreover, baseline data on parcel level characteristics, cost and detailed information on the owners of parcels applying for DUAT certificates is not available.

Second, there was a small sample of complete and quality DUAT certificates at baseline, due to poor record storage/keeping. As a result, the endline will apply MSU's recommendation from the 2016 EDR and utilize the entire population in the treatment sites from 2015 to the present to obtain as many valid records as possible for the analysis.

Third, based on the scoping and design trip, the team determined that the necessary administrative land record data will be in both digital and paper forms, depending on the office and type of data. We expect and are planning for a significant scanning and digitization effort in converting the paper form land

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<sup>65</sup> For full baseline results and balance tables, refer to MSU Baseline Rural and Urban reports: Jin., et al., 2017 and Jin, et al., 2016c

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administrative data from offices where SIGIT is no longer or only partially functioning and/or where land administrative units are fully dependent on paper records, from 2015 to the present.

Additional challenges the ET anticipates include:

- **Accessibility of some secondary datasets** including banking and credit records, conflict records, notary, predial, tax and municipal planning or service data. The timeline, especially for Phase 3 FGDs, may be extended depending on the accessibility of administrative land record and secondary data.
- **Respondent tracking and recall.** For household surveys, respondents may have moved or provided tracking data may be insufficient to identify the original household. Budget permitting, SI will work with Forcier to develop and implement a tracking exercise prior to the commencement of endline data collection in order to assess the scope of the issue and put in place mitigating protocols to respondent tracking and identification. This issue will be particularly compounded with displaced persons making both household and FGDs with this group challenging to implement. The team also anticipates challenges with the identification and recall of key actors including land administrative officials, mayors, etc. who may have moved from their posts or may have difficulty recall specific components of the intervention due to the time that has lapsed between the end of the Compact and endline data collection.
- **Quality of baseline household data.** While the ET has received the majority of requested data and information from the MSU baseline survey it is possible that additional issues or needs for clarification will surface during data collection and analysis. MCC's continued support in providing access to baseline researchers is requested.
- **Potential impacts of the 2019 general elections and weather events** which may impact the expected variation between treatment and comparison areas. First, Mozambique's general elections will occur in October 2019. The team has been advised by the local data collection firm to avoid conducting interviews the two weeks prior to the October 15<sup>th</sup> election to avoid high non-response results and is working to finalizing Phase 1 of data collection by late-September. Second, Mozambique has experienced two cyclones and consequent flooding in 2019; the latest in April 2019 is expected to heavily effect the Northern Mozambique though the extent of damage to the project areas is unknown at this time. Weather events such as these may contribute to displacement of respondents as well as changes in respondent assets, investments, income and consumption for treatment and comparison areas alike.
- **Ongoing conflict in Cabo Delgado.** Due to growing insecurity, qualitative research in Cabo Delgado is tentative. Rural quantitative interviews will be completed in Mecufi and are not affected. However, the data collection firm, Forcier Consulting, suggests researchers to not travel to the Cabo Delgado areas outside of Pemba due to safety and security concerns. At minimum, the areas of Mocoimba da Praia, Palma, Mueda, and Montepuez are being removed from the sample due to concerns ranging from regular conflicts between al-Shabaab and government soldiers, and attacks on vehicles. Therefore, the evaluation team will not send qualitative researchers to these areas. This will impact the open-ended KIIs, LAU KIIs and possibly LAU record digitization efforts in these areas. The evaluation team is currently reviewing ways to

interview respondents remotely or meet with them outside the insecure areas to capture the most data possible.

- **Securing permissions to collect LAU records.** Securing permissions to access government records at land administration offices is a time-intensive and sensitive process. With MCC's approval, we will begin by approaching the Director of DINAT to secure national level permissions, which we anticipate will take up to one month including negotiations around the details such as whether personally identifying information may be included in the data transfers. Once national-level permissions are secured, our data collection firm, Forcier, will require about another month to secure the relevant sub-national permissions as necessary. Due to the timing of the holiday season, this process will not be able to begin until mid-January. Based on what is agreed upon regarding the extent of data that we are able to collect (i.e. all records or a subset of records over a given time period, whether we can collect names or they will need to be removed, etc.) will greatly impact both the time that the digitization efforts will take, as well as the ultimate usefulness of the data. For example, if we cannot collect personal names, and there is no gender field in the records, we might not be able to answer key research questions on gender using these data.

## ADMINISTRATIVE

### 4.1 IRB Requirements and Local Clearances

In conjunction with MCC's commitment to respect and follow the Common Federal Policy for the Protection of Human Subjects where feasible, the evaluation team will ensure appropriate ethical clearance of evaluation materials in the endline evaluation. This includes aligning consent language with MCC's consent template and obtaining all relevant IRB approvals. It further involves employing SI's standard respondent protection and data security measures (described in detail in the next section).

SI has an in-house Institutional Review Board (IRB) registered with the U.S. Department of Health & Human Service (HHS) Office for Human Research Protections (OHRP). SI's IRB reviews applications for human subjects' research and will do so for this evaluation, reviewing the study protocol, data collection procedures, consent scripts, and data collection tools. SI's IRB review not only ensures that ethical procedures are followed but also that consent language and study procedures are in line with relevant contract requirements, e.g. in this case, that consent language allows for data dissemination through MCC's evaluation catalog.

In addition, SI closely monitors and adheres to human subject research regulations in its countries of operation. Based on consultation with Forcier, we anticipate that most data collection activities for this evaluation will not require extensive national-level permissions. The exception is regarding data collection activities at the land administration offices (LAU KIIs and land record digitization), which will require permissions at the national as well as subnational levels in order to ensure cooperation. The timeline and ultimate usefulness of this data is heavily dependent on the permissions process. Current estimates are that the permissions process will take about 2 months (about 1 month to secure national level permissions from the Director of DINAT including negotiations, and about 1 month to secure subnational level permissions). In addition, depending on which data the government agrees to share will influence both the process for collecting and digitizing the data, as well as its use in answering our research questions. For example, if we cannot collect personally identifying information, we will have to develop additional

procedures to remove this information when scanning paper documents, and if there is no gender field available this will further limit the data's usefulness in answering research questions related to gender dynamics. As this evaluation will focus on land governance, no local IRB approval will be needed from specific central ministries, since approvals from the Ministry of Health are only needed for health-related and primarily biological surveys. The sole national approval needed will be the national statistics institute (INE), which will review the questionnaire broadly to make sure no harm is inflicted upon respondents. We anticipate the process of obtaining INE approval will take six to eight weeks.

SI will also work with Forcier during preparation for fieldwork to obtain in-country permission to access study areas below the national level. Provincial and district-level permissions will be needed in each of the four provinces and eight districts. This includes a signed letter of intent from a provincial administrator that can be presented in various districts, and the same from a district-level administrator to present to local law enforcement in various barrios if needed.

## 4.2 Data Access, Privacy, and Documentation

SI's process for protecting respondents and ensuring data security during data collection, transfer, storage, analysis, and dissemination is governed by a set of SI standard operating procedures and respondent protection protocols. SI's procedures are intentionally aligned with MCC's microdata guidelines. Some of the key measures SI will implement to ensure data access, privacy, and documentation are described below.

*Data Collection:* Respondent and data protection in data collection starts first and foremost with the field data collection teams. It is critical that field teams understand proper procedures and behavior with respect to respondent privacy and data protection. Thus, during enumerator training, field teams receive a detailed briefing delivered by SI on ethical data collection practices, and strategies for ensuring respondent comfort, privacy, and prevention of data breaches. This also covers interviewer behaviors while administering the survey, handling of any evaluation documents/devices, and key preventive measures including device encryption and password-protection. Further, all field staff sign a non-disclosure agreement (NDA) which covers a range of behavioral and procedural measures to which they will be held accountable. Secondly, and critically, data protection during data collection is further ensured through the data collection software. As a standard practice, SI implements electronic data collection and will do so for this evaluation using SurveyCTO software. This will allow SI to control access to forms and datasets through a secure, password-protected, and permission-structured data server. It also allows for encryption during data submission from the field and storage in the server. Data will be encrypted, and only authorized study personnel will have access to the password in order to access and decrypt the data. In the rare case of any accidental breach during data collection (such as a loss of a backpack, theft of a device, etc.) field teams are instructed to report immediately to the SI project team, who then reports to the SI IRB, to discuss the extent of the incident and identify mitigating actions to implement.

*Data Transfer:* SI has additional guidelines for securely transferring data in cases where datasets or subsets of the data need to be transferred directly between (a) SI evaluation team personnel; or (b) between data collection firm management staff and the SI evaluation team (i.e. as is often done to reconcile any issues flagged in high-frequency data checks). Dataset transfers in these cases will be done securely through the use of 7zip software, which allows for AES-256-bit encryption in line with MCC and USG guidelines. Further, any datasets transferred in this manner will include PII only when necessary for a

purpose related to the evaluation. Otherwise it will be removed to reduce any residual probability of accidental disclosure.

*Data Storage & Analysis:* After data has been collected, when it is being stored and/or used for analysis, data is housed in secure locations through SI HQ. Stata datasets are stored in a shared drive with restricted permissions, where only authorized personnel are able to access it, for the purposes of cleaning, managing, and analyzing the data. Once datasets have been cleaned and analyzed, data is backed up in password-protected and permission-restricted folders on SI's intranet. This is the most secure way of storing the data after it has been analyzed as it is fully encrypted at rest and employs disk-level encryption and per-file encryption, conforming to AES-256-bit USG standards.

*Data Dissemination:* SI will adhere to MCC's Microdata Guidelines in preparing data for publication. All primary quantitative ex-post data collected as part of the evaluation will be submitted to MCC according to the most updated version of MCC's Disclosure Review Board (DRB) process. The evaluation team will submit the following deliverables to the DRB review process, as outlined by MCC: public use data file for each quantitative survey; all codebooks corresponding to each datasets submitted; analysis programs and command files for analysis and variable construction; and a Transparency Statement stating the extent to which the public data can enable verification of results presented in the evaluation report. All of this is also accompanied by a Nesstar metadata file describing the study design, methodology, and data generation process overall. For this evaluation, data will be merged together with the baseline data into single household dataset, de-identified, cleaned, and labeled to produce a final STATA dataset and csv file that will be submitted to MCC and made available to the public. SI will draw upon its detailed understanding of MCC's guidelines, DRB package worksheet, and risk assessment priorities to ensure an efficient DRB review process.

Further to this, all SI evaluation teams are required to adhere to SI's internal de-identification policy and detailed de-identification guidelines and innovative templates. As an added level of quality control, SI's project teams must also now submit their data package for review by a Data Review sub-team within SI's IRB, prior to submission or public posting. SI's IRB uses additional innovative templates to review datasets for potential accidental disclosures, queries the project teams about possible disclosure risks, and independently assesses the alignment between the team's data dissemination plans and consent language.

With regard to qualitative data, which are not covered by MCC's Microdata Guidelines, we will work with MCC to discuss on an instrument-by-instrument basis whether certain aspects of the qualitative data should be de-identified and disseminated either publicly or under restricted-access. The main considerations are whether (a) the data is analytically valuable more broadly to potential secondary users; (b) whether the data can be provided such that no content potentially discloses information about any respondents that could potentially harm them. For example, FGD transcripts with a sample of beneficiaries meant to represent a larger population are typically more analytically useful and normally carry fewer risks than KII transcripts of higher-level officials speaking about specific aspects of a given program. In the latter case, the content of the discussion itself could disclose identity, and is often so specific to a context that it may not be generally valuable to other researchers. Based on consultation with MCC before data collection, informed consent scripts for qualitative data collection will reflect the eventual intention of data dissemination on an instrument-by-instrument basis.

Written reporting will never contain PII or other information which could serve to disclose private or sensitive information.

### 4.3 Results Dissemination

In addition to MCC as the main audience for this evaluation, the evaluation team will be attuned to the interests and expectations of a wide range of audiences for this work, including policymakers, local government representatives, sector practitioners, and other organizations.

Findings will primarily be disseminated through required written reports as part of this contract. SI will submit a single, final evaluation report that will be produced at the conclusion of the endline phase, synthesizing results from all IE and PE activities included in the final endline design. For transparency and in line with contract requirements, SI will integrate comments from all reviewers on the EDR and final report and document actions taken on the basis of these comments in a public annex.

Dissemination plans for major deliverables will include, beyond the written reports, presentations to MCC and local stakeholders. The design report will involve an in-person presentation by the Evaluation Expert to MCC (EMC) and virtual presentation to stakeholders in Mozambique. Data collection instruments, once developed in the Option Period, will also be shared with local stakeholders for review and comments.

The final report will include in-person presentations at MCC (EMC and other participants) and in Mozambique, including – as desired by MCC – external sector stakeholders. In-country dissemination presentation will be attended by two international members of the SI evaluation team, as well as all Mozambique-based evaluation team members. SI's technical proposal suggested two in-country events at this stage. The first would include a smaller workshop involving the post-compact M&E (GoM POC) and Implementing Entities (i.e. those most closely involved in the M&E and implementation of the Land Project) to review key findings, ensure buy-in to the results, and clarify any questions. A second event will be oriented toward additional, external stakeholder, including other donors and additional officials from different levels of the Government of Mozambique (GoM) involved in the land sector.<sup>66</sup> In consultation with MCC, SI will determine the most valuable and feasible course of action for local dissemination presentation of final results.

Along with the final report, the team will develop evaluation briefs in line with MCC dissemination practices that synthesize findings across the evaluation components. Given the size and scope of this evaluation contract and the diversity of activities within it, SI will produce at least one Evaluation Brief (in MCC's new web-based format) with synthesized findings from the evaluation as a whole. SI will also discuss with MCC the potential for additional briefs which focus on particular aspects of the Land Project (e.g. a brief that focuses specifically on the Site-Specific IEs or the overall Land Project PE), assuming appropriate funding. Once approved by MCC, we propose to translate each of the briefs produced from English to Portuguese to aid dissemination of the information in country.

After the final report is submitted, SI will also work with MCC to determine the value and feasibility of coordinating additional presentations for external audiences, whether at MCC or through existing venues such as the annual World Bank Land and Poverty Conference.<sup>67</sup> As requested by MCC, the SI ET will

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<sup>66</sup> If it is determined that it is more feasible to conduct virtual reviews of the findings, SI will coordinate with our local field data coordinator and Forcier to arrange for an in-person presentation for those based in Mozambique, with virtual participation from others.

<sup>67</sup> Participation in such conferences was not assumed as part of this evaluation budget.

review any materials developed by MCC for external dissemination and participate as requested in any MCC-financed dissemination and training events.

#### 4.4 Roles and Responsibilities

Roles and responsibilities for each evaluation team member are described below in Table 13. Roles and responsibilities are designed to build on each team member’s specific expertise. Roles are clearly differentiated in order to achieve efficiency and avoid duplication of efforts.

**Table 13. Evaluation Team Roles and Responsibilities**

NAME	ROLE	RESPONSIBILITY
<b>KEY PERSONNEL</b>		
<b>Heather Huntington, PhD</b>	Evaluation Expert (Cloudburst)	Functionally the principal investigator of the study. Lead technical aspects of the evaluation, including design and methodology, instrument development, analysis, reporting, and dissemination. Delegates assignments to other key personnel and evaluation team members. Main technical POC for MCC.
<b>Anna Knox</b>	Land Administration Expert	Contribute to evaluation design, analysis, reporting. Lead selected components of qualitative data collection. Lead portions of dissemination events.
<b>Antonio Inguane</b>	Land Economist	Contribute to evaluation design particularly related to ERR/CBA methodology and background/context. Conduct ERR analysis, contribute to written deliverables, attend dissemination as applicable.
<b>[To be determined]</b>	Local Field Data Coordinator	Support in-country logistics of data collection including liaison with key stakeholders and data collection quality oversight. Assist in the development of qualitative tools, accompany Land Admin. Expert to conduct portions of qualitative data collection. Contribute to reports and dissemination as requested. Provide assistance as requested with in-country logistics and liaison with local agencies.
<b>OTHER TEAM MEMBERS</b>		
<b>Suha Satana</b>	ERR Advisor	Provide expert oversight for ERR/CBA methodology and analysis. Contribute to reports and dissemination as requested.
<b>Anne Girardin</b>	Land Information Systems Advisor	Provide expert oversight for land information systems data collection and analysis. Contribute to reports and dissemination as requested.
<b>Nicole Walter Aleta Starosta Kate Marple-Cantrell</b>	Research Analyst (Cloudburst)	Provide support for document and data reviews, instrument development, qualitative data collection and QA, data analysis and reporting.
<b>Maria Nagawa Emily Rains Ben Ewing</b>	Research Analysts (Duke)	Provide support for document and data reviews, instrument development, qualitative and quantitative data collection and QA, data analysis and reporting.
<b>SI HQ SUPPORT</b>		
<b>Geetha Nagarajan</b>	Team Leader	Oversee overall implementation of the evaluation and SI HQ team, ensure adherence to timelines, contract requirements, and budget. Provide QA and review for key deliverables. Ensure compliance with SI guidelines and policies.
<b>Danae Roumis</b>	Technical Advisory Support (TBD)	Provide technical support for data collection oversight and quality assurance.
<b>Brooke Hill</b>	Research Manager	Manage evaluation activities day-to-day, including routine communications, reporting, and coordination between team members. Provide support for document and data reviews, data

		collection instrument development, quantitative data collection and QA, and data analysis and reporting.
<b>Christina Seybolt</b>	Research Manager	Manage and oversee training and launch of fieldwork and/or pilot. Manage and support data quality assurance, backchecks, and data collection, data analysis, and reporting.
<b>Ibrahim Rashid</b>	Admin. Assistant	Contract management, administrative tasks, mobilization for team member travel, assist with preparation and submission of deliverables as requested.
<b>DATA COLLECTION FIRM</b>		
<b>Forcier Consultants</b>	Data Collection	Carry out quantitative data collection and selected components of qualitative data collection and administrative records extraction. Translation, back-translation, pre-testing of instruments, enumerator training and full-scale piloting, tracking respondents for household surveys, data quality assurance, and routine reporting. Adhere to SI's data quality and reporting standards. Fully reconcile any questions/issues flagged in data quality checks.

#### 4.5 Timeline and Reporting Schedule

As it is, the below timeline accommodates the need to complete data collection in Malema by February 2020, prior to the start of a new World Bank land activity there. The following timeline assumes that permissions for ISA data collection can be obtained before the end of February and all subsequent necessary arrangements can be made accordingly. Upon request, SI can develop a presentation of this EDR to MCC to help facilitate this timeline.

**Table 14: Evaluation Timeline**

ACTIVITY/TASK	ANTICIPATED START	ANTICIPATED COMPLETION / SUBMISSION
<b>BASE PERIOD</b>		
<b>EDR development</b>	December 2019	May 3, 2019
<b>EDR review by MCC</b>	May 6, 2019	May 17, 2019
<b>EDR review &amp; move to OY by MCC</b>	May 28, 2019	June 29, 2019
<b>EDR (Final)</b>	June 20, 2019	September 3, 2019
<b>EDR approval by MCC</b>	September 3, 2019	September 10, 2019
<b>OPTION PERIOD</b>		
<b>Rural Instruments</b>		
<b>Instrument Design</b>	June 30, 2019	July 25, 2019
<b>Instrument review by local stakeholders</b>	July 25, 2019	August 8, 2019
<b>Instrument review by MCC</b>	July 25, 2019	August 14 (HH); August 20 (wives); August 29 (FGDs), September 3 (KII), September TBD (CL), 2019
<b>Instrument Revisions</b>	August 15 (HH); August 21 (wives); August 30 (FGDs), September 3 (KII), September TBD (CL), 2019	September 13, 2019
<b>Instrument review &amp; APPROVAL by MCC</b>	September 13, 2019	September 20, 2019
<b>Fieldwork Preparation <sup>1</sup></b>	September 10, 2019	October 18, 2019
<b>Rural Data Collection</b>		

<b>Quantitative TOT, Training, Pilot</b>	October 21, 2019	October 29, 2019
<b>Qualitative Training, Pilot</b>	October 24, 2019	October 26, 2019
<b>Quantitative Data Collection (Rural)</b>	November 4, 2019	February 8, 2020
<b>Qualitative Interviews (Malema only)</b>	October 28, 2019	November 2, 2019
<b>Admin/ Urban Instruments</b>		
<b>Instrument Design</b>	August 31, 2019	November 1, 2019
<b>Instrument review by local stakeholders</b>	November 1, 2019	November 15, 2019
<b>Instrument review by MCC</b>	November 1, 2019	November 15, 2019
<b>Instrument Revisions</b>	November 18, 2019	November 25, 2019
<b>Instrument review &amp; approval by MCC</b>	November 25, 2019	December 4, 2019
<b>Fieldwork Preparation <sup>1</sup></b>	November 1, 2019	December 9, 2019
<b>Urban/Admin Data Collection</b>		
<b>Quantitative TOT, Training, Pilot</b>	December 9, 2019	December 19, 2019
<b>Qualitative Training, Pilot</b>	December 17, 2019	December 19, 2019
<b>ISA TOT &amp; Preparation</b>	December 16, 2019	December 19, 2019
<b>BREAK</b>	December 23, 2019	January 3, 2020
<b>Quantitative Data Collection (Urban)</b>	January 16, 2020	March 13, 2020
<b>ISA Kils</b>	March 6, 2020	August 1, 2020
<b>ISA Land Digitization &amp; LAU Kils</b>	March 6, 2020	August 1, 2020
<b>Qualitative Training</b>	June 8, 2020	June 12, 2020
<b>Qualitative Interviews (Mecufi, Urban)</b>	June 15, 2020	July 19, 2020
<b>Analysis &amp; Reports</b>		
<b>Analysis &amp; Report-writing</b>	April 6, 2020	December 7, 2020
<b>Draft Final Report</b>	December 7, 2020	December 7, 2020
<b>Final report review by local stakeholders</b>	December 7, 2020	December 23, 2020
<b>Final report review by MCC</b>	December 7, 2020	December 23, 2020
<b>Final Report Revisions</b>	December 28, 2020	March 8, 2021
<b>Final report review &amp; approval by MCC</b>	March 8, 2021	March 12, 2021
<b>Final dissemination (MCC)</b>	March, 2021	April, 2021
<b>Final dissemination (Mozambique)</b>	April, 2021	May, 2021
<b>Develop Final MCC Results Brief</b>	March, 2021	June, 2021

Notes: <sup>1</sup> Fieldwork preparation includes: programming tool electronically, translation & back-translation of revised tools and consents, pre-testing data collection instruments, obtaining SI IRB approval and local permissions (through and with Forcier), and planning fieldwork logistics with Forcier. <sup>2</sup> Surveys and various elements of the qualitative work will be conducted in a staggered manner across sites as described earlier in this EDR, for the duration of the dates specified in this table. Survey work in Malema will be completed prior to March 2020, to avoid contamination with the World Bank's launch of Sustenta.

## 5. REFERENCES

- African Development Bank (AfDB). (2017). "African Economic Outlook 2017: Entrepreneurship and Industrialization."
- Ali, D.A., K. Deininger, M. Goldstein. (2011). "Environmental and gender impacts of land tenure regularization in Africa: Pilot evidence from Rwanda." The World Bank: Policy research working paper series 5765.
- Arnot, C. D., M. K. Luckert, P. Boxall. (2011). "What is tenure security? Conceptual implications for empirical analysis." *Land Economics* 87(2): 297-311.
- Aronow, P. M., C. Samii. (2015). "Estimating average causal effects under interference between units." arXiv:1305.6156v2 [math.ST], 1–35.
- Athey, S., G. Imbens. (2016). "Recursive Partitioning for Heterogeneous Causal Effects." *PNAS* 113(27): 7353-7360.
- Austin P. (2009). "Using the standardized difference to compare the prevalence of a binary variable between two groups in observational research." *Communications in Statistics: Simulation and Computation* 38(6):1228–1234.
- D.A. Atwood. (1990). "Land registration in Africa: the impact on agricultural production." *World Development* 18(5): 659-671.
- Benjamini Y, Y. Hochberg. (1995). "Controlling the false discovery rate: a practical and powerful approach to multiple testing." *Journal of the Royal Statistical Society: Series B.* 1995(57):289–300.
- Besley, T. (1995). "Property rights and investment incentives: theory and evidence from Ghana." *Journal of Political Economy* 103(5): 903-937.
- Boucher, S.R., M.R. Carter, C. Guirking. (2008). "Risk Rationing and Wealth Effects in Credit Markets: Theory and Implications for Agricultural Development." *American Journal of Agricultural Economics* 90(2): 409-423
- Brasselle, A. S., F. Gaspart, J. Platteau. (2002). "Land tenure security and investment incentives: Puzzling evidence from Burkina Faso." *Journal of Development Economics* 67(2): 373-418.
- Bromley, D. W. (2009). "Formalising property relations in the developing world: The wrong prescription for the wrong malady." *Land Use Policy* 26(1): 20-27.
- Carter, M., K. Wiebe. (1990). "Access to Capital and Its Impact on Agrarian Structure and Productivity in Kenya." *American Journal of Agricultural Economics* 72(5): 1146-1150.
- Central Intelligence Agency. (2019). Mozambique. In *The world factbook*. Retrieved from <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/mz.html>
- Deininger, K., D. A. Ali, S. Holden, J. Zevenbergen. (2008). "Rural Land Certification in Ethiopia: Process, Initial Impact, and Implications for Other African Countries." *World Development* 36(10): 1786-1812.
- Deininger, K., G. Feder. (2009). "Land registration, governance, and development: Evidence and implications for policy." *World Bank Research Observer* 24(2): 233-266.

- Deininger, K., S. Jin. (2006). "Tenure security and land-related investment: Evidence from Ethiopia." *European Economic Review* 50(5): 1245-1277.
- Deininger, K. D.A. Ali, T. Alemu. (2011). "Impacts of Land Certification on Tenure Security, Investment, and Land Market Participation: Evidence from Ethiopia." *Land Economics* 87(2): 312-334.
- Diamond, A., J. Sekhon. (2013). "Genetic Matching for Estimating Causal Effects: A General Multivariate Matching Method for Achieving Balance in Observational Studies." *The Review of Economics and Statistics* 95(3): 932-945.
- Dower, P., E. Potamites. (2005). *Signaling Credit Worthiness: Land Titles, Banking Practices and Access to Formal Credit in Indonesia*. Working Paper, New York University.
- Feder, G., R. E. Just, D. Zilberman. (1985). "Adoption of agricultural innovations in developing countries: a survey." *Economic Development & Cultural Change* 33(2): 255-298.
- Feder, G., T. Onchan, Y. Chamlamwong, C. Hongladarom. (1988). "Land Policies and Farm Productivity in Thailand." Johns Hopkins University Press, Baltimore, MD.
- Feder, G., A. Nishio. (1998). "The Benefits of Land Registration and Titling: Economic and Social Perspectives." *Land Use Policy* 15(1): 25-43.
- Field, E., M. Torero. (2006). "Do Property Titles Increase Credit Access Amount the Urban Poor?"
- Gelman, A., J. Hill, M. Yajima. (2012). "Why We (Usually) Don't Have to Worry About Multiple Comparisons." *Journal of Research on Educational Effectiveness* 2012(5): 189-211.
- Ghebru, H., S. T. Holden. (2015). "Technical efficiency and productivity differential effects of land right certification: A quasi-experimental evidence." *Quarterly Journal of International Agriculture* 54(1): 1-31.
- Goldstein, M., C. Udry. (2008). "The Profits of Power: Land Rights and Agricultural Investment in Ghana." *Journal of Political Economy* 116(6): 981-1022.
- Goldstein, M., K. Hounghbedji, F. Kondylis, M. Sullivan, H. Selod. (2015). "Formalizing Rural Land Rights in West Africa: Early Evidence from a Randomized Impact Evaluation in Benin." The World Bank: Policy research working paper series 7435.
- Hainmueller, J. (2012). "Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies." *Political Analysis* 2012(20): 25-46.
- Higgins, D., T. Balint, H. Liversage, P. Winters. (2017). "Investigating the impacts of increased rural land tenure security: A systematic review of the evidence." Paper presented at *2017 World Bank Conference on Land and Poverty*. The World Bank, Washington DC.
- Holden, S. T., K. Deininger, H. Ghebru. (2009). "Tenure insecurity, gender, low-cost land certification and land rental market participation." Paper presented at the *International Association of Agricultural Economists Conference*. Beijing, China.
- Holden, S. T., K. Deininger, H. Ghebru. (2011). "Tenure insecurity, gender, low-cost land certification and land rental market participation in Ethiopia." *Journal of Development Studies* 47(1): 31-47.

- Holden, S.T., and H. Ghebru. (2013). "Welfare Impacts of Land Certification in Tigray, Ethiopia." *Land Tenure Reform in Asia and Africa*: 131-161. Palgrave Macmillan, London.
- Huntington, H., A. Haflett, B. Ewing. (2018). "The Impact of Interventions to Propose Climate Change Adaption: Does Stronger Tenure Security Increase Farmer Investment in Sustainable Agroforestry?" World Bank Annual Land & Poverty Conference, March 2018.
- Jin, Songqing, M. Maredia, R. Pitoro, G. Schultink, E. Payongayong. (2016a). "Baseline Report for the National Land Administrative Interventions in Districts and Municipalities in Northern Mozambique under MCA-Mozambique's Land Tenure Services Project." Michigan State University. Retrieved from <https://data.mcc.gov/evaluations/index.php/catalog/143/download/850>
- Jin, Songqing, M. Maredia, R. Pitoro, G. Schultink, E. Payongayong. (2016b). "Impact Evaluation Designs for the Mozambique-MCA Land Project." Michigan State University. Retrieved from <https://data.mcc.gov/evaluations/index.php/catalog/143/download/851>
- Jin, Songqing, M. Maredia, R. Pitoro, G. Schultink, E. Payongayong. (2016c). "Impact Evaluation of Site-specific Activities under the Land Tenure Services Project: Report of the Baseline Survey Conducted in Two Urban Areas in Northern Mozambique." Michigan State University. Retrieved from <https://data.mcc.gov/evaluations/index.php/catalog/124/download/538>
- Jin, Songqing, M. Maredia, R. Pitoro, G. Schultink, E. Payongayong. (2017) "Impact Evaluation of Site-specific Activities under the Land Tenure Services Project: Report of the Baseline Survey Conducted in Two Rural Areas in Northern Mozambique." Michigan State University. Retrieved from <https://data.mcc.gov/evaluations/index.php/catalog/124/download/593>
- Krantz, L. (2017, May). "Applying a Community-Based Approach to Tenure Reform: Experiences from Northern Mozambique." Retrieved from <http://www.cfuzim.org/~cfuzimb/images/mozland.pdf>
- Lawry, S., C. Samii, R. Hall, A. Leopold, D. Hornby, F. Mtero. (2014). "The impact of land property rights interventions on investment and agricultural productivity in developing countries: a systematic review." *Campbell Systematic Reviews* 2014(1).
- Lin, W. (2013). "Agnostic notes on regression adjustments to experimental data: Reexamining Freedman's critique." *The Annals of Applied Statistics* 7(1): 295-318. doi:10.1214/12-AOAS583. <https://projecteuclid.org/euclid.aoas/1365527200>
- Lisher J. (2018). *Impact Evaluation of Land Tenure and Governance Interventions*. World Bank Annual Land & Poverty Conference, March 2018
- Locke, A. (2014). "Mozambique land policy development case study." Evidence on Demand, UK. Retrieved from [www.focusonland.com/download/532c7189db16e/](http://www.focusonland.com/download/532c7189db16e/)
- Melesse, M., E. Bulte. (2015). Does land registration and certification boost farm productivity? Evidence from Ethiopia. *Agricultural Economics*. 46(6).
- Meinzen-Dick, R., E. Mwangi. (2009). "Cutting the Web of Interests: Pitfalls of Formalizing Property Rights." *Land Use Policy* 26(1): 36-43.
- Migot-Adholla, S.E., F. Place, W. Oluoch-Kosura. (1994). "Security of Tenure and Land Productivity in Kenya." Kendall/Hunt.

- Millennium Challenge Corporation. (2007). "Mozambique Compact." Retrieved from <https://www.mcc.gov/where-we-work/program/mozambique-compact>
- Millennium Challenge Corporation. (2013). "MCA-Mozambique: Monitoring and Evaluation Plan." Retrieved from [https://assets.mcc.gov/content/uploads/2017/05/ME\\_Plan\\_-\\_MOZ\\_-\\_V3\\_-\\_Dec13.pdf](https://assets.mcc.gov/content/uploads/2017/05/ME_Plan_-_MOZ_-_V3_-_Dec13.pdf)
- [Payne, G. \(2008\)](#). "Social and Economic Impacts of Land Titling Programmes in Urban and Peri-Urban areas: International Experience and case studies of Senegal and South Africa."
- Place, F. (2009). "Land Tenure and Agricultural Productivity in Africa: A Comparative Analysis of the Economics Literature and Recent Policy Strategies and Reforms." *World Development* 37(8): 1326-1336.
- Rosenbaum, P., D. Rubin. (1985). "Constructing a Control Group Using Multivariate Matched Sampling Methods That Incorporate the Propensity Score." *The American Statistician* 39(1): 33-38.
- Sanjak, Jolyne. (2003). Commentary and Reaction to Theme Paper: Legal and Regulatory Requirements for Effective Rural Financial Markets. Lead Theme Paper for the International Conference on Best Practices: "Paving the Way Forward for Rural Finance" by Heywood W. Fleisg and Nuria de la Peña, Washington, DC, prepared for the World Council of Credit Unions, Inc. (WOCCU) and supported by USAID through (BASIS-CRSP).
- USAID. (2018) Country Profile: Mozambique. Retrieved from <https://www.land-links.org/country-profile/mozambique/#1529323171829-5e48b63a-007d>
- World Bank, World Development Indicators. (2019a). GDP Growth (*annual %*) [Data file]. Retrieved from <https://databank.worldbank.org/data/reports.aspx?source=2&series=NY.GDP.MKTP.KD.ZG>.
- World Bank. (2019b) Poverty headcount ratio at national poverty lines (% of population) [Data file]. Retrieved from <https://data.worldbank.org/indicator/si.pov.nahc?locations=br-mz>.

## 6. ANNEXES

### 6.1 Evaluation Budget

*Given sensitivities around future procurements, the full budget has been included as an attachment.*

As part of the development and planning of the evaluation the team notes the following areas of the budget for consideration:

Labor line items have been revised to accommodate the scope of work proposed in this EDR. In addition, we are recommending adding three Duke Research Analysts to the team. These individuals - with experience in field-based data collection, statistical and qualitative methods for data analysis and land tenure and property rights research and evaluation - will support various aspects of each of the three evaluations. Given the scope, scale, and number of activities that will be undertaken over a long period of time, many of them simultaneous, SI and Cloudburst/Duke have learned from working together on past evaluations for MCC that the most efficient way to achieve high quality results in these scenarios is to delegate various aspects of management to different team members. Under the direction of the Evaluation Expert, the research assistants will support the training preparations and field-based data collection launch, including pilot oversight and data collection monitoring. Their primary tasks will focus on supporting quantitative and qualitative data management and data cleaning, as well as generating descriptive statistics, coding qualitative interviews and focus-group discussions and running econometric models for the household panel data. They also will conduct background or secondary literature reviews, as needed. We propose their inclusion under the “Research Analyst” labor category and, as with the current RA, they will be included under the Cloudburst Subcontract. Their costs will be accommodated within the current labor ceiling.

The data collection plug figure included at the proposal stage has been disaggregated into the proposed data collection activities to be undertaken by the data subcontractor to facilitate MCC’s review of each discrete data collection activity proposed in the EDR in terms of its analytical value and cost. These costs were estimated by the data subcontractor, Forcier, with guidance from Social Impact as to each activity. It should be noted that unit costs are estimates with the potential to realize savings/efficiencies once the scope of work, including timeline and activities, has been finalized.

### 6.2 Detailed Evaluation Question and Methods Crosswalk

*See attached.*

### 6.3 Variables used in Power Calculations

Baseline Questionnaire Variable	Overview	Variable generated	Var Types
<b>SectionAA</b>	Total cost of non-food	MSU var totnofoodcor = total monthly non-food consumption (mt)	Continuous
	Total costs of monthly food consumption	MSU var - totconsmonth = total monthly food consumption (mt)	Continuous
	Total cost of non-food less Section X	MSU var - totexp = Total monthly non-food expenditure (x only)	Continuous
	Diversity Diet Score	MSU var - HDDS1 = diversity dietary score index	Discrete
	HH income	MSU var - hhincome = HH income including land rentals	Continuous
	HH income less outlier	hhincome2 = HH income including land rentals less outlier	Continuous
<b>B19</b>	Salaried work	salaried = 1 if anyone in HH works salaried work	Binary
<b>B20</b>	Self Employed work	selfempyn = 1 if anyone in HH is self employed	Binary
<b>C4</b>	Receives remittances	remessas = 1 if anyone in HH receives remittances	Binary
<b>G01</b>	Probability of conflict (parcel level)	g01 = 1 if HH is concerned about conflict for ANY of their parcels	Binary
<b>G04</b>	Probability of losing parcel to conflict (parcel) level	generate =1 if HH mentions any probability (high, moderate, somewhat), gen lost_prop if HH is concerned about losing ANY of their parcels to conflict	Binary
<b>H0A</b>	HH rents out any parcels	h0a = 1 if yes	Binary
<b>H04</b>	Buildings on rented parcels	h04 = total number of building on rented parcels (limited to those with rented parcels)	
<b>H05</b>	Rent out buildings on rented parcels	rent_build = 1 if HH rents out ANY buildings on ANY of their rented parcels (limited to those with rented parcels)	Binary
<b>J07</b>	Electricity on parcel	j07 = proportion of plots owned by that HH that have electricity	Continuous
<b>J08</b>	Landline on parcel	j08 = proportion of plots owned by that HH that have landline	Continuous
<b>J09</b>	Mobile phone network on parcel	j09 = proportion of plots owned by that HH that have mobile network	Continuous
<b>J10</b>	Buildings on ALL parcels	j10 = total number of buildings on ALL parcels owned by HH	Discrete
<b>Investment Indicator</b> (K01, K07, K13, K19, K25, K31, K37, K43, K49)	Investment in Land (y/n) in past 12 months)	MSU var - invested = 1 if HH has invested on at least one of their parcels	Binary
<b>N01</b>	DUAT certificate increase/decrease land value	n01_new = 1 if increase	Binary
<b>N02</b>	Pay more/less for land with DUAT certificate	n02_new = 1 if more	Binary
<b>N03</b>	More willing to sell with DUAT certificate	n03_new = 1 yes	Binary
<b>N04</b>	More willing to rent with DUAT certificate	n04_new = 1 yes	Binary

<b>N05</b>	DUAT certificate make disputes more/less likely	n05_new = 1 if more or somewhat more likely	Binary
<b>N06</b>	DUAT certificate will make dispute resolution more/less likely	n06_new = 1 if more or somewhat more likely	Binary
<b>N07</b>	More willing to construct with DUAT certificate	n07_new = 1 if more or somewhat more likely	Binary
<b>N08</b>	More able to obtain credit with DUAT certificate	n08_new = 1 if more or somewhat more likely	Binary
<b>N16</b>	Women have right to inherit	n16_new = 1 if yes	Binary
<b>N17</b>	Women have right to maintain in divorce	n17_new = 1 if yes	Binary
<b>N18</b>	Women have right to formal land title	n18_new = 1 if yes	Binary
<b>N19</b>	Informed on 1997 law	n19_new = 1 if yes	Binary
<b>T01 (Y for any type of fruit tree)</b>	HH have this type of fruit tree	MSU var - t01 = 1 if yes	Binary
<b>V01</b>	Use of improved seed	MSU var - v01 = 1 if yes	Binary
<b>V05</b>	Full time ag workers	MSU var - v05a = 1 if yes	Binary
<b>V06</b>	Part time ag workers	MSU var - v06a = 1 if yes	Binary
<b>V07</b>	Chemical Fertilizer	MSU var - v07a = 1 if yes	Binary
<b>V08</b>	Pesticides	MSU var - v08a = 1 if yes	Binary
<b>V09</b>	Animal Traction	MSU var - v09a = 1 if yes	Binary
<b>V10</b>	Tractors	MSU var - v10a = 1 if yes	Binary
<b>V11</b>	Bicycles	MSU var - v11a = 1 if yes	Binary
<b>V12</b>	Ploughs	MSU var - v12a = 1 if yes	Binary
<b>V13</b>	Other Farm Equip	MSU var - v13a = 1 if yes	Binary
<b>Y01</b>	Receive credit in past 12 months	MSU var - yy01 = 1 if yes	Binary

## 6.4 Stakeholder Comments and Evaluator Responses

*This section will be completed following MCC & Stakeholder Review of the EDR.*

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