



SECOND LEVEL LAND CERTIFICATION (SLLC) FOR RURAL LANDS OF ETHIOPIA: PROCESSES, EXPERIENCES AND LESSONS

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List of abbreviation

BG	Benishangul Gumuz region
CALM-LA	Climate Action Trough Landscape Management- Land Administration Program
CR	Claim Receipt
CE	Circular Error
CGRE	Climate Resilience Green Economy
DEO	Data Entry Operator
DT	Digitization Technician
ELAP	Ethiopia-Strengthening Land Administration Program
ELTAP	Ethiopia-Strengthening Land Tenure and Administration Program
FLLC	First Level Land Certification
GCP	Ground Control Point
GoE	Government of Ethiopia
KLAC	Kebele Land Administration Committee
FT	Field Team
FTL	Field Team Leader
FLLC	First Level Land Certification
FMS	Field Map Sheet
GE	Government of Ethiopia
GCP	Ground Control Point
GTP	Growth and Transformation Plan
GPS	Ground Positioning System
GHG	Green House Gas
HRSI	High Resolution Satellite Imagery
iMASSREG	Interim Mass Registration Data base
KIM	Kebele Index Map
LIFT	Land Investment and for Transformation Program
LTRSP	Land Tenure regularisation Program
QGIS	Quantum Geographical Information System
REILA	Responsible and Innovative Land Administration Project
RO	Regional Office
RLLP	Rural Landscape and Livelihood Project
RLAUD	Rural Land Administration and Use Directorate
SLLC	Second Level Land Certification
SIDA	Swedish International Development Agency

TST	Technical Support Team
ToT	Training of Trainers
UK-DIFD	United Kingdom Department for International Development
UPIN	Unique Parcel Identification Number
USAID	United States Agency for International Development, Ethiopia
VG	Vulnerable Group
WC	Woreda Coordinator
WLO	Woreda Land Office
WB	World Bank

SUMMARY

To promote the tenure security of smallholder farmers inhabiting the highlands parts of the country, the Government of Ethiopia (GoE) started the implementation of the First Level Land Certification (FLLC) as of 1998. The FLLC was undertaken at a massive scale, rapid speed, participatory, low cost and pro-poor with positive impacts. In a span of about ten years period, first level certificates were issued to about 73 % of the total rural households in the four regional states (i.e., Amhara, Oromia, Southern Nations and Nationalities (SNNP) and Tigray regions (MoA,2011). The successes notwithstanding, the FLLC lacked spatial data component in the cadastral data sets with systemic deficiencies to recording transactions. As an upgradation of the FLLC, a program on Second Level Land Certification (SLLC) was initiated with series of pilot trials with support of different donor agencies as early as 2002. Since then, multiple rural land administration programs engaged in multiple trials and research to select the appropriate cadastral surveying techniques for undertaking SLLC. The piloting exercises, among others, involved the testing of different surveying methodologies ranging from simple Hand-Held Geographical Positioning System (HH-GPS) to high end precision GPS and total station.

The full-scale implementation of SLLC using orthophoto techniques began around 2011/12 to achieve the targets set in the country's 5-Year Growth and Transformation Plan-I (GTP-I) with a plan period stretching from 2010/11 to 2014/15. A study tour was organized to Rwanda to experience the massive land certification program undertaken by Land Tenure and Regularization Program (LTRSP). Accordingly, the Ministry of Agriculture (MoA) prepared a Strategic Road Map on Rural Land Administration and Use targeting to complete SLLC for a total about 50 million parcels owned by smallholder farmers during GTP-I period. This was paralleled by acquisition of orthophotos by Amhara, Oromia, SNNP and Tigray regions and embarked implementing SLLC in their respective regions as early as 2012/13. Prior to 2012/13, however, SLLC was implemented using a hybrid of cadastral surveying techniques ranging from HH-GPS to high precision GPS.

Since 2008, the following four rural land administration programs embedded SLLC and maintenance of land registration system as programmatic component:

- Sustainable Land Management Program -I/II (SLMP-I/II)/ Rural Land Scape and Livelihood Project (RLLP): Supported by the World Bank (WB).
- The Responsible and Innovative Land Administration -I/II (REILA-I/II): Supported by Finland Government.
- The Land Investment for Transformation (LIFT) Program: Supported by United Kingdom-Department for International Development (UK-DIFD); and
- The Climate Action Through Landscape Management- Land Administration (CALM-LA) program: Supported by the WB.

Among all the above four programs, LIFT program is the largest program with huge resources allocated to undertake SLLC and Rural Land Administration System (RLAS), where the latter component embed a support to establishing a functioning land registration maintenance system and rural land administration information services. LIFT is a 7- year program stretching from 2014 to 2021. LIFT commenced implementing SLLC using orthophoto techniques as of March,2015 with all the preparatory works completed in 2014. The program prepared the SLLC manual later endorsed by the GoE in November, 2014 and served as a standard manual for undertaking SLLC by all four programs.

The SLLC manual describes the series of activities to implement the seven sequential SLLC processes: preparatory works; awareness raising to different stakeholders; adjudication and demarcation, data verification and correction, certificate printing; and certificate distribution to landholders. The manual also included procedures on data quality assurance to maintain the standard for key SLLC processes.

Although the design, program focus areas, components, and resources of the above four programs differ in significant manner, considerable achievements have been recorded in SLLC performance. In a space of about 12.5 years, the four programs all together demarcated a total of about 20.3 million parcels and certified nearly 14.6 million parcels. The overall certificate issuance rate is monumental, where about 72% of the total demarcated parcels is issued to smallholder farmers. Relative to the four programs, LIFT program alone demarcated a total of about 78% of the total demarcated parcels by all the four programs followed by SLM-I/II/RLLP program, which demarcated a total of about 11% of the total demarcated parcels by all the four programs. Successes recorded by LIFT program is uniquely exceptional with respect to key SLLC performance indicators even when compared with similar large scale certification programs in Africa. Extraordinary performance is notable in certificate distribution process and cost efficiency. LIFT program distributed about 89% of the total printed certificates, which is remarkable when compared to large scale certification programs in Africa and WB supported land certification programs in Asia. Indeed, the four years average cost/certificate with LIFT program is about UK £ 7/certificates, which is very low cost when compared with large scale certification programs in Africa which used more or less similar approaches. The current average cost/certificate with LIFT is expected to drop with time with economies of scale. The above notwithstanding, challenges related to legal issues, organizational aspect, delays in timely supply of the required resources and sporadic civil unrest impeded the implementation performances of all programs.

Projection of a realistic time frame to certify the remaining 30 million parcels owned by smallholder farmers is not a straightforward matter given limitation in resources, the fragmented nature of SLLC implementation by different programs and lack of the updated Strategic Road Map on Rural Land Administration System. The above notwithstanding, assuming that resources are not limiting and SLLC implementation process modelled based on approaches pursued by LIFT and CALM-LA due to comparative advantage criteria, about 13 years is required to complete SLLC for the remaining 30 million parcels owned by smallholder farmers.

Performance towards achieving the intended outcome level objectives seems promising as indicated by some extensive surveys. A recent widescale survey with large sample size on SLLC outcome indicated the positive impacts of SLLC on tenure security, land related disputes and investment on land. On the flip side, chronic and pervasive challenges remain with service inefficiency to record transfers by the “*Woreda Land Offices (WLOs)*” on the one side and informality in transactions on the other side hanging in balance all the expected benefits to be derived from the massive SLLC database which is generated with massive investment. Wavy and inconsistent political support by the government for functions to record transactions, weak organizational capacity and lack of resources attributed to poor service delivery by “*Woreda Land Offices (WLOs)*”, which is one of the core public services at the woreda government level. Informality in transaction is considerably high where about 68% of the transactions are undertaken informally. This decade old problem maybe repeating itself, which is also occurring in many African countries, as well. Similar cases are reported in the Rwanda massive LTRSP and the Kenyan large scale land registration program.

Based on experiences from the implementation of SLLC and maintenance of land registration system, extensive lessons are drawn in program design and implementation processes. Most of the lessons drawn are generic in nature with high transferability to other counties with slight modification to suit country - specific situations. Some program-specific lessons impact efficiency and result in quick wins with potential to be transferred to other countries if the demand exist for large scale certification program. The lessons drawn are encapsulated under two thematic areas: a) SLLC; and; b) maintenance of land registration system thematic areas:

1-SLLC component

a) Legal aspects

- The requirements for detailed legal provision that governs the key SLLC processes is one of the necessary conditions for effective implementation of SLLC

- Photogrammetric approach is “Fit-for Purpose” for large scale certification program given parcel boundaries are air-visible and detectable.
- Preparation and endorsement of national level Strategic Road Map on Rural Land Administration system that set the clear objectives, strategies, sequencing of SLLC operation and establishment of rural administration information system is a necessary condition to streamline and harmonize operations and to effectively achieve the medium- and long-term objectives.

b) Political support and ownership by the government

- Design and implementation of a package of incentive mechanisms to enhancing the political support and ownership of SLLC operation by the government is one of the critical conditions to achieve effectiveness, efficiency, and sustainability of SLLC programs.

c) Organizational capacity

- Introduction and implementation of various workable incentive mechanisms to retain and avoid the turnover of trained staffs is one of the key strategies to building the organization capacity of land offices.
- Training of Trainers (ToT) approach is the best organizational capacity approach for undertaking large scale certification programs and in large size country like Ethiopia.

d) SLLC process

- It is important to continuously update SLLC manual based on implementation feedbacks, typically in grey areas where there are legal caveats to describe the key SLLC processes. This is critically important not only to ensure the tenure security of different social groups and resources under different tenure regimes but also to achieve efficiency and effectiveness.
- A strategy to pursue process in-built quality assurance/quality control mechanism is the best strategy to maintain the standards for key SLLC processes in less developed countries where there are no privately licenced companies or certified individuals to undertake the task.
- It is critically important to develop a standard on cost/certificate to allow cost efficiency comparison among different rural land administration programs.
- The SLLC monitoring system should be holistic and rigorous to track the progress of each key SLLC process in the workflow to minimize back logs in any of the processes in the workflow.
- Large scale certification programs using orthophoto techniques can be undertaken with sub-professional grade staffs with provision of an intensive short-term training.

e) Program design

- The design of any land administration program with SLLC component embedded should ensure SLLC completeness in program *woredas* to avoid disfranchising a segment of a society uncovered by SLLC and ensure the maintenance of land registration system.
- Design and implementation of one large SLLC program rather than fragmented SLLC programs supported by different donor agencies with a basket fund from all different donor agencies is the preferred and best pathway to attain maximum efficiency and effectiveness.

2) Maintenance of land registration system

a) Legal framework

- Preparation and enactment of detailed legal provisions on land registration maintenance system is one of the necessary conditions not only to institutionalize a functioning service to recording transactions but also sustaining the rural land administration system.

b) Political support and ownership of land registration maintenance by the government

- Design and implementation of various incentive mechanisms including carrot, and stick combined with sermon types are critical elements to enhance the political support and ownership by the government to successfully establish and operationalize a functioning system to record transfers. Strong political support and ownership by the government is a necessary pre-condition for the success of any interventions related to maintenance of land registration system.

c)organizational capacity

- Capacity building of land administration institutions should NOT be limited to training of individual staffs but beyond. It should be comprehensive and should address the multiple dimensions of organizational capacity based on thorough organizational capacity assessment which include elements such as organizational vision and strategy, structure, business process and others. Any capacity building process limited to building the capacity and skill of individual staffs is doomed to fail.

d)Financial sustainability

- Design and implementation of a cost recovery strategy to recover the partial/full cost of the operating cost for services to record transactions and strategies to increase revenues to the government should be an in-built component of rural land administration program/project. The implementation process of the same should commence at the early stage of the program's lifetime rather than at the end of the program's lifetime.

e) Program design

- Programs in land administration should NOT be bounded and biased towards land certification components with a limited resource allotted for components associated with maintenance of land registration system. Land administration is about system and processes and therefore should encompass a strong component on the maintenance of land registration system with sufficient resources allocated rather than to be bogged down to achieving an ambitious certification target.

1-INTRODUCTION

To address the long and deep seated tenure insecurity problems of smallholder farmers inhabiting the highlands parts of the country , the Government of Ethiopia (GoE) initiated the First Level Land Certification (FLLC) in 1998 in four regional states of the country; Amhara, Oromia, the Sothern Nations, Nationalities and Peoples (SNNP) and Tigray regional states .The implementation of FLLC was pioneered in Tigray regional states in 1998 followed by Amhara, Oromia and SNNP regional states. Within a period from 1998 to 2010, first level land certificates were issued to about 73 % the total rural household in the above four regional states (MoA,2011). The rapid speed, participatory nature, low-cost, pro-poor and the positive impacts of FLLC are described as remarkable success with lessons to be shared with other African countries (Deininger,2007). Cost/parcel is estimated to be USD\$ 1.0/parcel, which is cheaper than “low cost” procedures reported elsewhere (Deininger,2007). Notwithstanding the success, among others, the FLLC approach lacked spatial framework data in the cadastral data sets with procedural deficiencies to maintain and update the rural land registry record. As an upgradation of the FLLC, a Second Level Land Certification (SLLC) was initiated as of 2002 with piloting trails supported by different donor agencies.

The pilot trails on SLLC, among others, aim to test the different cadastral surveying methodologies ranging from simple Hand-Held Geographical Positioning System (HH-GPS) to high -end precision GPS to select the appropriate cadastral surveying techniques for undertaking SLLC. The first move to commence large scale SLLC program based on orthophoto technique was commenced around 2011/12 triggered to achieve the SLLC targets set in the Country's 5-Year Growth and Transformation Plan- I(GTP-I) with a planning period extending from 2010/11 to 2014/15. The GTP-I targeted to complete SLLC for a total of about 50 million parcels owned by smallholder farmers. In parallel, to gain experiences a study tour was undertaken to Rwanda to experience the land certification implemented by Land Tenure and Regularization program (LTRSP). Since 2011/12, virtually all rural land administration programs which embedded SLLC component used orthophoto techniques to implement SLLC.

As of 2008, the following major rural land administration programs with programmatic components on SLLC and maintenance of land registration system continued implementing SLLC and intervention support to the GoE to establishing a functioning system to registering transactions:

- The Sustainable Land Management Program-I/II (SLMP-I/II)/ The Rural Landscape and Livelihood Project (RLLP): Supported by the World Bank (WB).
- The Responsible and Innovative Land Administration Program-I/II (REILA-I/II).
- The Land Investment for Transformation (LIFT) Program (LIFT): Supported by United Kingdom, Department for International development (UK-DIFD).
- Climate Action Through Landscape Management- Land Administration (CALM-LA) program-Supported by WB

The above four programs vary in programme design, objectives, focus area, components, and resources. Differences in program design notwithstanding, among others, the above four programs have been implementing SLLC and supported the GoE to establishing a functioning system to record transfers. The scale and scope of SLLC operations and the support interventions to establishing a system to record transfers is enormously different from one program to another. Likewise, the level of performance, experiences and challenges in SLLC implementation processes, maintenance of land registration system and thereof the lessons to be drawn. Vast and extensive lessons can be drawn from the above four rural land administration programs in programme design, implementation processes and successes toward achieving the outcome level objectives. The massive lessons synthesized and drawn with a potential to be transferred and knowledge shared to other Intergovernmental Authority on Development (IGAD) member countries where the demand exist for large scale certification programs for areas characterized with sedentary agriculture with different tenure niches.

The above as a backdrop, this paper aims to describe and review the key SLLC process based orthophoto techniques and the overall implementation performance of the four rural land administration programs with respect to SLLC and maintenance of land registration system. Finally, it draws important lessons from the experiences with a potential to be transferred to other IGAD member countries where the demand exists to initiate large scale certification program.

2-METHODOLOGY

A combination of the following two techniques was used to generate and collect the required datasets, where the massive data sets were primarily collected and assembled from the review pertinent documents literatures:

- Review of relevant documents and literatures: Extensive programme related documents including the programme design report, manuals/guidelines, annual reviews and Mid-term evaluation reports of the four rural land administration programmes were reviewed and digested. Additionally, relevant literatures from other relevant countries were reviewed to provide an overview comparison of the performance; and
- Focussed Group Discussion: A limited and focussed primary data were collated based on FGDs organized with selected staffs of the Rural Land Administration and Use Directorate (RLAUD) of the Ministry of Agriculture and

The massive data collected were analysed based upon “Thematic Framework Approach”, the thematic areas framed based upon five key SLLC processes: adjudication/demarcation, data processing, data verification and correction, certificate printing and certificate distribution processes. The large volume of data on RLAS component, however, mainly collected and assembled from LIFT programme given RLAS component as a strong wing and component of the programme compared with other programmes.

3-SECOND LEVEL LAND CERTIFICATION (SLLC) PROCESS

3.1-Overview on SLLC process

The implementation of SLLC programs is based on SLLC manual which is finalized and endorsed by the GoE in November,2014. The approach is frame worked on parcel-based registration system, systematic adjudication, and general boundary approach rather than fixed boundary approach. The demarcation and mapping process is based on orthophoto techniques which suits the general boundary approach and suitable for cost-effective large-scale certification of rural lands. Adjudication and demarcation data are collected at field level with active participation of landholders, neighbouring farmers, and representatives from *kebeles*¹ and local elders. Field captured data are processed at the office level to produce the digital register. The initial data in the register are subjected to data verification and correction process with active participation of landholders and local institutions followed by certificate printing and issuance of second level certificates to landholders.

The general process to undertake the SLLC is shown in Figures 3.1. and 3.2 and consists of the following seven sequential steps:

- Preparatory works.
- Public awareness.
- Demarcation and adjudication
- Textual data entry and parcel digitization.
- Data verification and correction.
- Production/printing of certificates; and
- Issuance /distribution of certificates

SLLC process embed a series of processes where an output from one process is an input to the next one.

3.2-SLLC process

3.2.1-Preparatory phase

Before the start-up of SLLC operation, a series of preparatory works are prerequisites to effectively deliver the various SLLC outputs. The key preparatory works include:

a) *Undertaking rapid assessment*: The prime purpose is to provide a background information on general socio-economic conditions, office facilities, potential risks and mitigation measures and others in selected program *woredas*².

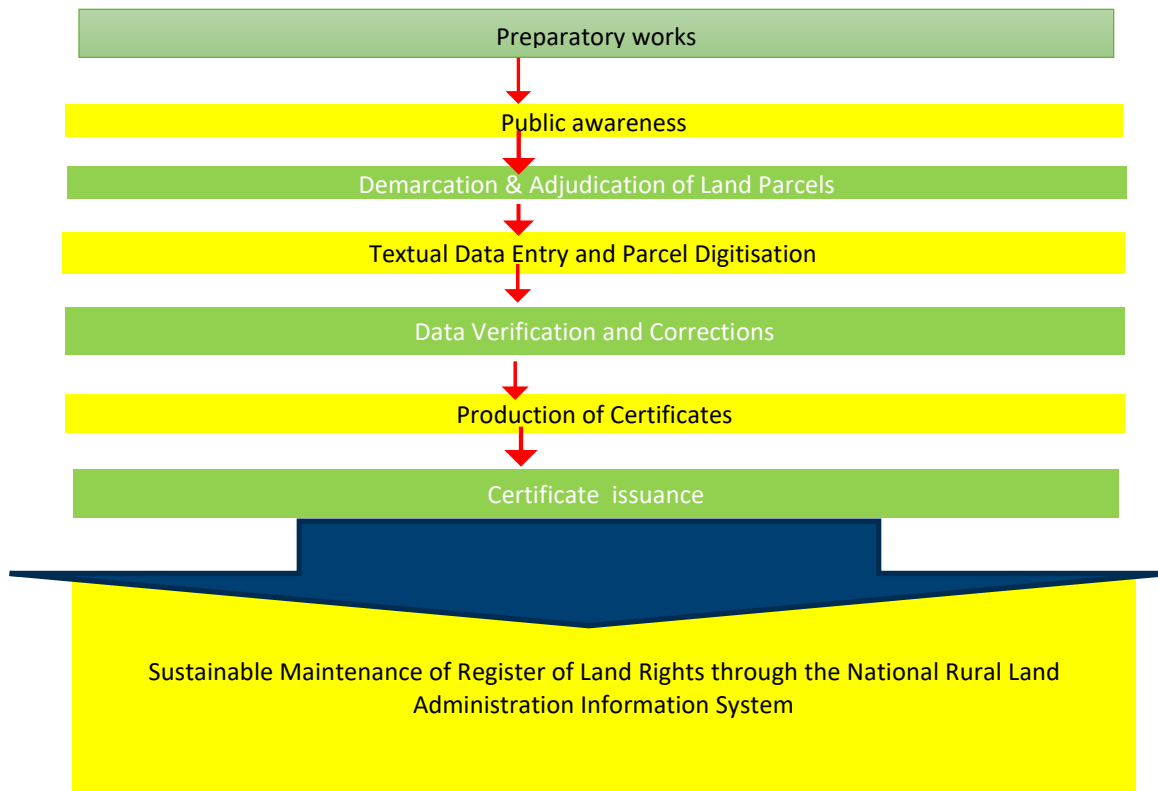
b) *Supply of all the required resources*: Acquisition and supply of al the required equipment/materials, office furniture's, transport facilities and others to the regional Offices (RO) and Woreda Offices (WOs)

c) *Recruitment of Contract Staffs*: Recruitment of contract staffs for “Regional Offices (ROs)” and “Woreda Offices (WOs)”. At the WOs, where the actual SLLC implementation takes place, the following two groups of contract staffs are recruited based on functions and roles:

¹ **Kebele**: The smallest administrative unit consisting of about 800 to 1220 Households (HHs) and 2800 to 4800 land parcels

² **Woreda**: An administrative unit immediately higher than the Kebele which consists of about 25 kebeles. In total there are more 700 woredas in the whole country.

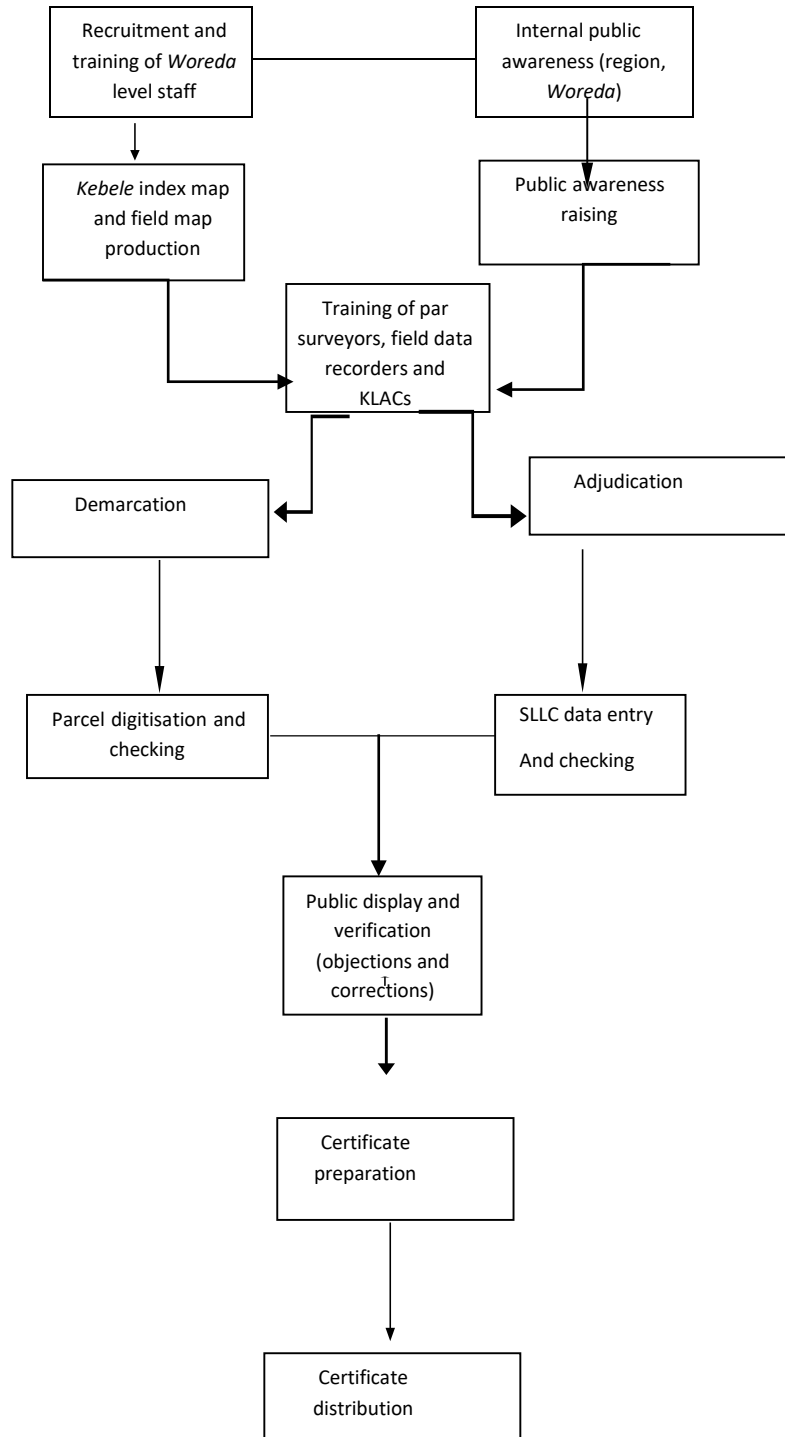
Figure 3.1- General SLLC processes



- *Field Team (FT) staffs*: The FT staffs are responsible to collect adjudication and demarcation data sets at the field level. Each FT consists of the following five staffs.
 - ✓ 1 Field Team Leader (FTL).
 - ✓ 2 Para surveyors; and
 - ✓ 2 Field Data Recorders (FDR)
- *Technical Support Team (TST)*: The TST staffs are responsible to process the field collected textual and spatial data sets and printing certificates at the office level. Based on the type of functions and duties, the TST staffs are divided into the following two functional groups:
 - ✓ *Textual Data Entry Group*: This group contain the Data Entry Operators (DEO), who are responsible for data entry and processing of textual data sets. The average number of DEOs/ *woreda* range from 6 to a maximum of 12 DEOs/ *woreda* depending on number of parcels/ *woreda*
 - ✓ *Parcel digitation group*: This group contains “Digitization Technicians (DTs)”, who are responsible to digitize field demarcated parcels and produce parcel maps. The average number of DT/ *woreda* may range from 2 to a maximum of 4 DT/ *woreda* depending on total number of parcels/ *woreda*.

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Figure-3.2-SLLC process for the main SLLC activities.

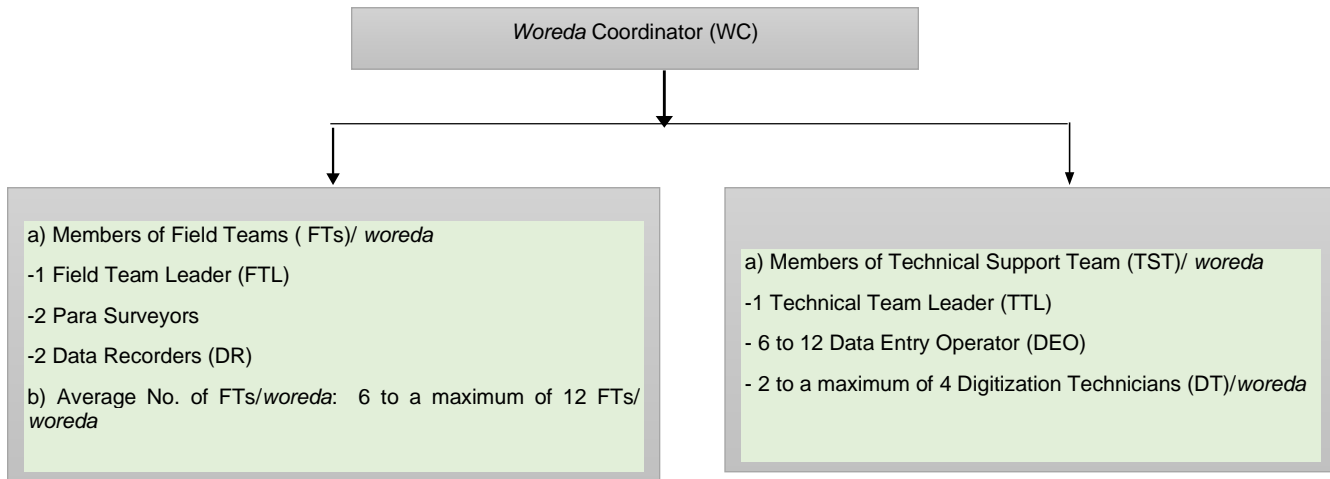


The FTs and TSTs are led and coordinated by “*Woreda Coordinator (WC)*”. The structure and number of contract staffs recruited and deployed at the WO level is shown in Figure 3.3.

d) Training of Contract, RO and WO staffs: Organization of a series of trainings to contract staffs and the ROs and WOs government staffs.

e) Preparation and production of various formats and maps: Production of various formats and maps to capture adjudication/demarcation data sets. It includes “Kebele Index Map (KIM), Field Map Sheets (FMS) and “Field Registration Forms (FRFs)”.

Figure 3.3- Structure and contract staffs at the program *woreda* level



3.2.2-Public awareness raising to different stakeholders

To create increase demand for SLLC, awareness raising are organized targeting different stakeholders at *woreda* and *Kebele* levels. Various stakeholders have various stakes and roles in different SLLC process and activities. A series of awareness raising are organized to different stakeholders at the *woreda* and *kebele* levels on the one side and to landholders to the other side.

Public awareness activities are targeted to reach the grassroots to foster their participation in the whole SLLC process. Special focus is given to increase the awareness level of women and Vulnerable Groups (VGs). When they are aware of the process, the more likely they are to take supportive and compliant measures. To increase the participation of landholders at every key SLLC operation stage, awareness raising are organized to landholders prior to every key SLLC process.

The key awareness message disseminated at key SLLC stages and the means of information dissemination is shown in Table 3.1.

Table-3.1- Key awareness raising messages and means of information of dissemination during various SLLC stages

SLLC stages	Key messages	Mean of information dissemination
1-Demarcation/adjudication	<ul style="list-style-type: none"> a) Purpose and importance of SLLC b) Purpose/importance of demarcation/adjudication. c) Documents to bring with by landholders during demarcation/adjudication process c) Time schedule of the demarcation/adjudication events 	<ul style="list-style-type: none"> a) Meetings at the “kebele” level b) Social gathering places (i.e., churches, mosques, etc) c) Development Groups (DGs) d) Leaflets and posters
2-Data verification and correction (Public display (PD))	<ul style="list-style-type: none"> a) Purpose/importance of data verification and correction: Public display (PD) b) Documents to bring with by landholders when attending the event c) Time schedule of the PD event (the time and place of the event) 	The same as above
3-Certificate distribution	<ul style="list-style-type: none"> a) Purpose/importance of certificate collection event. b) Importance to registering transaction. c) Time schedule of the certificate distribution event 	The same as above

3.2.3-Adjudication and demarcation process

The Federal Rural Land Administration and Use Proclamation defines three tenure variants for the rural lands of Ethiopia: “private holdings”, “communal holdings”, and “government/state holding” (FDRE,2005). The adjudication and demarcation process ascertain the tenure rights for the three tenure niches. Rural land adjudication and demarcation process is undertaken at the same time. The purpose of adjudication process is to determine and confirm the ownership of, and the legal interest of the subject as per the above three tenure variants. While demarcation is a process of marking boundaries of each parcel on the ground on orthophoto based on visible physical features on the ground.

3.2.3.1- Adjudication process

The adjudication process is undertaken based on “Systematic Registration” approach. Data about ownership and parcel attributes is recorded on to the “Field Registration Form (FRF)” based on parcel-by-parcel basis. Systematic adjudication is in the longer term less expensive and efficient approach because of economies of scale, safer because it gives maximum publicity to the determination of who owns what within an area, and more certain because investigations take place on the ground with direct evidence from the owners of adjoining properties. The procedures to undertake the adjudication process embed the following sequential steps:

a) public awareness to landholders: Organization of awareness raising to landholders. The message disseminated include about the importance of adjudication/demarcation, documents to bring with by landholders and the date and time when the event takes place (See also Table 3.1).

b) Ascertaining ownership and recording disputes: Ownership is ascertained via verification of the FLLC certificate and testimonies from the neighbours and local elders. If the ownership is disputed, it will be negotiated between the claimants during the adjudication process. If disputes remain unsettled during adjudication process, disputes are recorded in “Dispute Claim” formats and issued to disputants. For parcels where the ownership is ascertained, attribute data about the owner and parcel are recorded on to FRF (See also Figure 3.5).

For “Communal lands” which are commonly “grazing land” or “community forest”, the ownership is ascertained with the presence of the “Kebele Administration (KA)” representatives, Kebele Land Administration Committee (KLAC) and representatives from users of the communal land and neighbours.

c)Registration of attribute data on to “Field registration Form (FRF): For parcels where the ownership is ascertained, attribute data about the owner and parcel are registered on to the FRFs with issuance of “Landholding Claim Receipt (CR)”. The Data Recorder (DR), who is a member of the FT are tasked to record the attribute data on to the FRFs.

3.2.3.2- Demarcation process

Orthophoto is used as prime method to produce cadastral maps because of the following key reasons (See also Chapter 5):

- **Purpose/Objectives:** Although the exact specific details on the purpose of spatial data are missing in the existing rural land legal frameworks, by de facto a general boundary approach is in pursuant for surveying and mapping of rural lands which is suitable for large scale rural land certification program.
- **Cost factor:** In general, photogrammetric techniques is considered as more cost-effective for initial compilation of large-scale cadastral plans, given the boundaries are visible on the aerial photographs and enough boundary lines are surveyed. Although the unit cost of orthophoto is relatively higher compared to High Resolution Satellite Imagery (HRSI), demarcation based on aerial photography is cost effective where economies of scale is applied.
- **Air visibility of rural land boundaries:** Rural land parcel boundaries are often demarcated with stone/soil bund, furrow and hedge trees which are air visible and easy to demarcate on-the-ground.
- **Accuracy levels:** High resolution aerial photography produce high level of positional accuracy given sufficient resources. However, the bottom line in choosing the appropriate approach is not one of accuracy but rather the purpose and practicality reflecting the principles of “Fit-for-Purpose” approach.

With the current advancement in satellite imagery and remote sensing technology, the potential use of HRSI should NOT be understated, however,

High resolution orthophoto with ground resolution ranging from 25 to 40 cm are used for SLLC. The process is based on printed orthophoto as a base map and demarcate and produce parcel maps. The legal boundary of each parcel is defined based on “General boundary” approach, where boundaries are defined and demarcated using physical features such as hedge trees, soil/stone bunds, and others. The process of demarcation involves the following two series of steps:

a) Awareness raising to landholders: Public awareness organized prior to adjudication and demarcation process.

b) Demarcation process: Each parcel is demarcated on to the Field Map Sheet (FMS) with the presence of the landholders (i.e., both husband and wife), the neighbours and representatives from the KLAC members. The “Para Surveyor”, who is the member of each FT, will walk around the boundary and draws the boundary on the FMS based on visible physical features with annotation of a “Unique Parcel Identification Number (UPIN) (See Figures-3.4 and 3.5). Disputed parcels which are not resolved during demarcation /adjudication process are still marked on the FMS and the disputes recorded in the “Dispute Forms”.

3.2.4- Data entry and parcel digitization process

The textual and spatial data sets captured at the field level are processed at the program *woreda* offices by the TST staffs. The textual data collected using FRFs are entered and processed using a computer system referred as “Interim Mass Registration Data Base (iMASSREG)”. It is a database created for large scale recording of SLLC claim data and high volume of certificate production. While parcel maps drawn on hard copy FMS are digitized and converted into digital form using Quantum Geographical Information System (QGIS).

The textual data captured on the FRF are entered and processed using iMASSREG system. A “Double Entry” system is used for entering textual data to identify and flag inconsistent and wrongly recorded data and to make corrections. Once the data entry process is completed for one *Kebele*, the system generates data entry reports for the whole *kebele*.

The spatial data sets collected at the field level are processed using QGIS software. The parcel polygons drawn on the FMSs are scanned and georeferenced using QGIS software. The parcels demarcated on the FMS are digitized. Once the digitization process for all parcels for a *kebele* is completed, errors from the digitization process and field demarcation are checked and verified. As a data quality check, the total number of parcels demarcated, textual data entered using iMASSREG and digitized parcels for a particular *Kebele* should be nearly equal and the maximum variations should be within a limit of 2 %. The spatial and textual data sets are linked using the UPIN and digital register created.

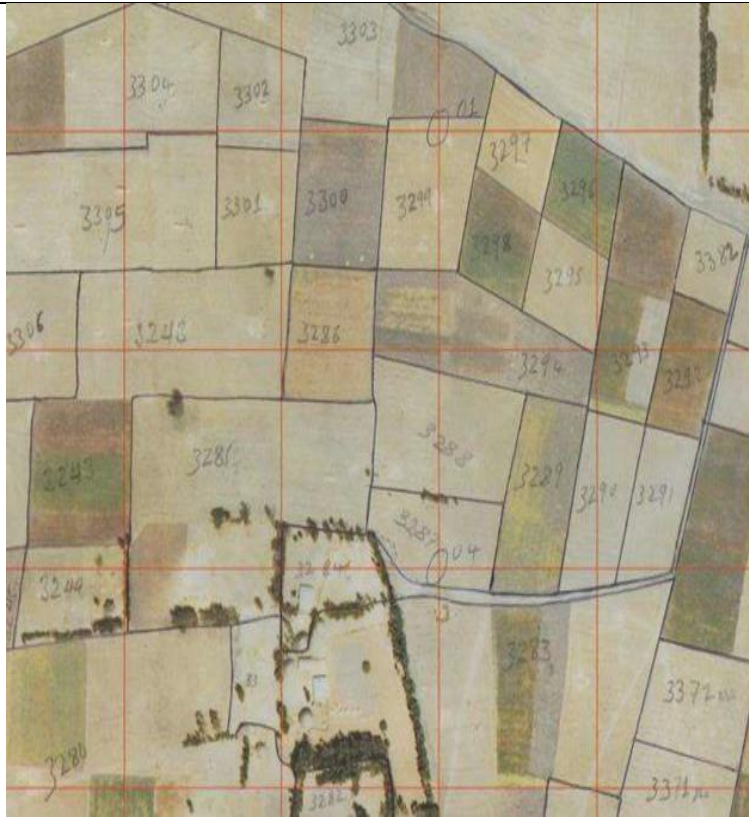


Figure -3.4- Example of Pencil-drawn Parcel Boundaries on a Field Map Sheets (FMS)



Figure 3.5- The Para surveyor and Data Recorder (DR) undertaking adjudication and demarcation tasks at field level: Illustration from "**Doba woreda**" in Oromia region.

3.2.5-Data verification and correction

Post-completion of the textual and spatial data processing for a batch of *kebeles*, data in the register are displayed to the *kebele* community for data verification and correction via organization of Public Display (PD) event. During the PD event, data recorded in the register are verified and missing and/or incomplete data are collected and completed. The PD event is organized from one week to one month's depending on number of parcels / *kebele* and efficiency of the *woreda* and *kebele* offices to manage the PD event. The data verification and correction process involve the following three series of steps:

- **Awareness raising to the kebele community:** Organization of awareness raising to landholders in a *kebele* prior to organization of the PD event. The awareness raising messages streamlined on the importance of PD event, documents to bring with by landholders and the place and time of the PD event (See also Table 3.1).
- **Orientation during data verification process:** During the PD event, each landholder is oriented about the data posted. Landholders check and verify the posted data sets and any corrections made are registered as "Minor" and "Major" corrections and recorded on the "Correction Forms".
- **Data corrections:** Post- PD event, all errors recorded are corrected and missing and incomplete data collected. Finally, using iMASSREG, the data base is updated and ready for printing certificates.

3.2.6-Certificate preparation

Parcel-based certificates which contain both the textual and spatial data are automatically generated using iMASSREG system after review and approval by *woreda* official. The approval and certificate printing process are undertaken automatically in batches using iMASSREG system. Certificates are prepared, approved, and printed for parcels which are not disputed and with complete information as required by law.

3.2.7- Certificate distribution

Certificate distribution process is the last stage of SLLC process, where printed certificates are distributed to landholders. The process involves the following series of steps:

- **Awareness raising to landholders:** Organization of awareness raising to landholders prior to organization of certificate distribution event. The awareness raising messages focus on importance of certificate collection, documentary to carry with by landholders when attending the event, importance to registering subsequent transactions and the place and time of the certificate distribution event.
- **Certificate distribution event:** Post-awareness raising, certificate distribution event is organized at the *kebele* level. The event goes on from one week to about four weeks depending on number of parcels/ *kebele*, participation level of landholders and level of political support and commitment provided by the program *woreda* management staffs.

4-SLLC PERFORMANCE

In Ethiopia, SLLC has been implemented by SLMP-I/II/ RLLP, REILA-I/ II, LIFT and CALM-LA programmes since 2008 and onwards. Although the program design, focus areas, program components and total resources allocated vary among programs a remarkable progress has been achieved to certify rural smallholder farmers with second level certificates. The efficiency levels measured by demarcation and certificate issuance rates show significant variations among the programs. The key driver factors include the program's focus area, resources, institutional set up and robustness of the monitoring system, among others. Efficiency measured by cost/parcel remains tacit and grey due to the inconsistencies of the methodological approach used by different programs. In terms of focus and resources, LIFT program is the largest program with a huge budget allocated for SLLC and RLAS components reaching a total of about UK £ 51 million.

This chapter covers the overall SLLC performance of the above four rural land administration programs with detail inscription on LIFT program followed by synthesis of the overall performance of all the four programs. The fact that LIFT is a massive large-scale program, details are incorporated on determinants related to SLLC efficiency at operational level/program *woreda* level and progress towards achieving the outcome level objectives.

4.2-SLLC output performance of the key rural land administration programs

4.2.1-The Sustainable Land Management Program (SLMP-I/ II/RLLP)

The SLMP-I/II/RLLP funded by the WB is currently in its third phase and commenced SLLC operation as of 2008. The three sequential phases of the program include:

- SLMP- Phase-I: 2008 to 2013
- SLMP-II- Phase-II: 2014 to 2018; and
- The Resilience Landscape and Livelihood Project (RLLP)-Phase-III: 2019 to 2024

All the three sequential programs encompassed components on land administration and land use. By design, watershed is used as a unit of development rather than administrative unit and therefore the program lacking completeness in SLLC coverage in all program *woreda*. The three sequential programs embedded SLLC components and implemented SLLC in selected watersheds located in 6 regional states of the country (i.e., Amhara, Oromia, SNNP, Tgray, Beneshangul-Gumuz (BG) and Gambella regions). Since the start-up of SLMP-I program, all the three sequential programs altogether demarcated a total of about 2.2. million parcels and issued around 1.5 million second level certificates (See Table 4.1). The percentage of certificate issuance rate is estimated at 67 % from the total demarcated parcels. After certification process, functions related to land record maintenance is wholly vested upon the regional and *woreda* governments with little intervention support by the program, however.

Table 4.1- Total demarcated and certified parcels by SLMP-I /II /RLLP: 2008 to September,2020.

SLLC output	SLMP-I / II (2008 to 2018)	RLLP (2019 to September,2020)	Totals/averages (parcels/yr.)
1-Demarcation			
1.2-Total demarcated	1,750,503	474,963	2,225,466
1.2-Average annual demarcation rates			227,088 ¹
2-Certificate distribution			
2.1-Total certificates distributed	1,199,255	339,594	1,538,849
2.2-Average annual certificate distribution rate			157,025 ¹
1: Estimated implementation period: The total implementation period is estimated from January,2008 to September 2020 with a total implementation period of about 9.8 years.			

4.2.2-The Responsible and Innovative Land Administration (REILA-I/II) project

The Finland Government supported REILA-I / II two sequential projects have been implementing SLLC in Amhara and BG regions as of 2011 and onwards. During the 1st three years of REILA-I (i.e., from 2011 to 2013), the project focused on pilot trials based on orthophoto techniques. Among others, REILA-I and REILA-II projects embedded SLLC as a component and implemented SLLC in eight and six program woredas located in Amhara and BG regions, respectively. By design, the two sequential programs do not cover SLLC for the entire program *woreda* resulting in partial SLLC coverage in all program *woredas*. The partial SLLC coverage in program *woreda* is flagged as typical problem undermining the SLLC data completeness, proper maintenance of the land registers and to derive the multiple benefits from the rural land administration information system (REILA,2020).

REILA-I started full scale SLLC operation around 2014 in eight program woredas followed by REILA-II with eight program *woredas* in Amhara region and six program *woredas* in BG region. In about 6.5 years of implementation period, the two successive projects demarcated a total of about 1.2 million parcels and issued certificates to a total of about 682,277 parcels (See Table 4.2). The average demarcation and certificate issuance rate is at about 179,869 /yr. and 104,966 / year respectively (See Table 4.2). The certificate issuance rate is estimated at 58% of the total demarcated parcels.

During REILA-II, the cost/certificate in Amhara and BG region is estimated at EUR 3.81 /parcel (equivalent to USD \$ 4.6 /parcel) and EUR 14.2/parcel, respectively (equivalent to US \$ 17/parcel (Including costs for aerial photo, vehicle investment and technical assistance) (REILA-II, 2020). Based on SLLC performance in Amhara and BG regions, the Mid-Term Review Report of REILA-II project rated the program with better cost efficiency compared to LIFT program, where the cost /certificate with LIFT in 2019 was around UK £ 3.45/certificate (REILA-II, 2020). Inconsistencies in the approach used by two programs, however, makes the comparison unrealistic.

Table 4.2- Total demarcated and certified parcels by REILA-I and II: 2011 to June ,2020.

SLLC output	REILA-I (2011 to 2016)	REILA-II (2017 to June ,2020)	Totals/averages (parcels/yr)
1-Demaraction			
1.2-Total demarcated	435,087	734,061	1,169,147
1.2-Average annual demarcation rate			179, 869 /yr ¹
2-Certificate distribution			
2.1-Tota certificates distributed	195,434	486,843	682,277
2.2-Average annual certificate distribution rate			104, 966/Yr.
1: Estimated implementation period: The total implementation period is estimated from January,2014 to June 2020 with a total implementation period of about 6.5 years.			

4.2.3- The Land Investment and Transformation (LIFT) program

4.2.3.1-Program output level performance

LIFT is a massive, large scale rural land certification program with a total budget of UK £ 51 million allocated for SLLC and RLAS components. LIFT commenced SLLC implementation in March,2015 in program *woredas* located in Amhara, Oromia, SNNP and Tigray regional states. During about 5.5 years of implementation period (i.e., March 2015 to end of Sepetmber,2020), a total of about 15.8. million parcels have been demarcated, 14 million parcels approved, 13.8 million parcels printed, and 12.4 million certificates issued to landholders (See Table 4.3 and Figure 4.1). The annual average demarcation and certificate issuance rates stands at 2.9 million/yr. and 2.2 million/yr., respectively. Commendable success has been achieved in certificate issuance rate where about 89% of total printed certificates were issued to landholder. Even compared to the total demarcated parcels, certificates issuance rate is about 78% of the total demarcated parcels. This is a monumental achievement even compared to experiences in countries in Africa and Asia. In rural land titling programs supported by the WB, the certificate issuance rates of successful programs such as the Thailand Land Tilting -I and II projects and Indonesia and Lao projects, is in a range of 70 to 80% (Holstein, 1996). In Rwanda, which is the only African country that recently completed a nation-wide, low cost and participatory land regularization efforts (i.e., the Land Tenure Regularisation program -LTRSP), from February,2010 to August,2013, from a total of 8.4 million prepared freehold titles and leases, only about 5.7 million were collected by landholders (Gillingham. and Felicity., 2014).

The average figures, however, masks the inter-annual variability of the performance efficiency and the associated driver factors for inter-annual variability. As shown in Table 4.3 and Figure 4.1, the annual demarcation rate ranges from 1.9 million parcels/yr. in 2019/20 and picked up to nearly 4.0 million

parcels/yr. in 2017/18 and 2018/2019 primarily due to the scaling up of the program after the Mid-term Review (LIFT, 2017) and the economies of scale afterwards. In general, the inter-annual, variability in demarcation rate are associated with incremental phased approach of the program, timely acquisition of the requires resources and inputs, turnover rates of the trained staffs, robustness of the monitoring system and the level of political support for SLLC operations by the regional and *woreda* governments. Significant decrease in demarcation rate is notable during 2019/2020, which is primarily caused by sporadic civil unrest and emergence of COVID-19 pandemics. While the annual certificate issuance rate ranges from 795, 403 certificates in 2015/16 to 3.5 million in 2018/19. In general, however, the yearly certificate issuance rate picked up after 2017/18 and onwards due to the increased engagement of the regional and *woreda* governments in monitoring the certificate distribution process via field visit and organization of a series of monitoring workshops.

The cost/certificate issued with LIFT range from UK£14.32 in 2016 to UK£ 3.44 in 2019 yielding a four-year average of about UK £ 7.00 (equivalent to about to UD \$ 9/ certificate). The cost is estimated as a quotient of the total program's expenditures on SLLC and RLAS (i.e. all procured goods and services in each year) with a total approved parcel in each year and therefore showing inter-annual variability. The expenditures on both goods and services decreased with time with economies of scale and with increasing number of total parcels approved from year to year resulting in inter-annual variations. Expenditures spent to procure good and services decline with economy of scale as the program continue operation and program's various cost saving mechanisms. With exception of year 2016, LIFT achieved the cost efficiency targets from 2017 and onwards. The series of Annual Review Reports described the program as most cost-efficient land certification program (LIFT, 2017a; 2018; 2019a). The 2019 LIFT program Annual Review described the program as world record for cost and scale of land certification operation, where the cost/certificate dropped to UK £ 3.4/certificate (nearly equivalent to US \$ 4.4/parcel) in 2019 from preceding successive years (LIFT,2019a). The cost /certificate with LIFT support is claimed to be efficient even when compared to Rwanda and Mozambique, where the average cost/ parcel in Rwanda is about is USD\$ 7.56 and USD\$ 33 in Mozambique (DAI, No year). Gillingham, and Felicity, B, (2014) compared the unit cost /parcel of the Rwanda LTRSP with Lesotho and Kyrgyzstan where the land certification programs are more or less similar. The cost/parcel in Rwanda is between UK £ 3.42 (US \$ 5.47) and UK £ 4.05 (US \$ 6.48), while in Lesotho is about US \$ 69/lease and US \$ 10 in Kyrgyzstan (Gillingham, and Felicity, B, 2014)

A quick overview on land certification implementation performance of the Rwanda LTRSP and LIFT program is undertaken to compare the general performance of the two programs. Both programs have many commonalities in terms of SLLC approach and institutional framework to implement the land certification program. Both programs use orthophoto techniques to demarcate land parcels and adopted systematic registration and general boundary approaches to ascertain ownership rights and demarcate parcel boundaries. Semi-professional rather than professional staffs were deployed to undertake the massive adjudication/demarcation and processing field captured data. However, the two countries differ with respect to land mass area, terrain, tenure history, governance system, and other factors. Notwithstanding the above, the scale and volume of the total demarcated, certificate printed, and certificate issued are larger volume with LIFT program compared to Rwanda LTRSP (See Table 4.4). The speed of demarcation rates of both LTRSP and LIFT stands nearly at equal footing (See Table 4.4). Notable difference lies in certificate issuance efficiency, where LIFT program issued nearly 89 % of the total printed certificates to landholders, while the LTRSP distributed about 68 % of the total printed leases and freehold titles to landowners from February,2010 to August 2013 (See Table 4.4). With LIFT program, the massive political support provided by the regional and *woreda* governments combined with routine monitoring system in place contributed to monumental achievement in certificate distribution process. In the case of Rwanda, distribution of the printed title has been quite a challenge for successive years and picked up after completion of the LTRSP. In March,2012, only about 924,086 titles were distributed (i.e., nearly about 12% of the total printed) and later in June 2017, the collection picked up to about 7.16 million titles by landowners (i.e., nearly about 85 % of the total printed titles) (Trustee of Princeton University,2017). In Rwanda, among

others, lack of awareness, poor access to service and collection fees in place (i.e., about UK £ 1) contributed to low certificate collection rates (Trustee of Princeton University,2017; Gillingham, and Felicity, B, 2014).

Table 4.3 - SLLC output by LIFT program: March 2015 to end of September 2020							
SLLC Outputs	Progress by year					Cumulative totals	Annual average
	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020		
1-Demarcation	3,010,289	2,883,610	3,939,206	3,971,701	1,947,463	15,752,269	2864049
2-Approval	1,849,189	2,667,877	3,667,834	4,206,393	1,611,248	14,002,541	2545917
3-Certificate printing	1,541,849	2,717,964	3,421,172	4,500,468	1,631,770	13,813,223	2511495
4-Certificate Distribution	795,403	2,361,272	2,938,584	3,542,515	2,711,963	12,349,737	2245407

Note: Program implementation period extend from end of March,2015 to end of September,2020 . Total implementation period is about 5.5 years

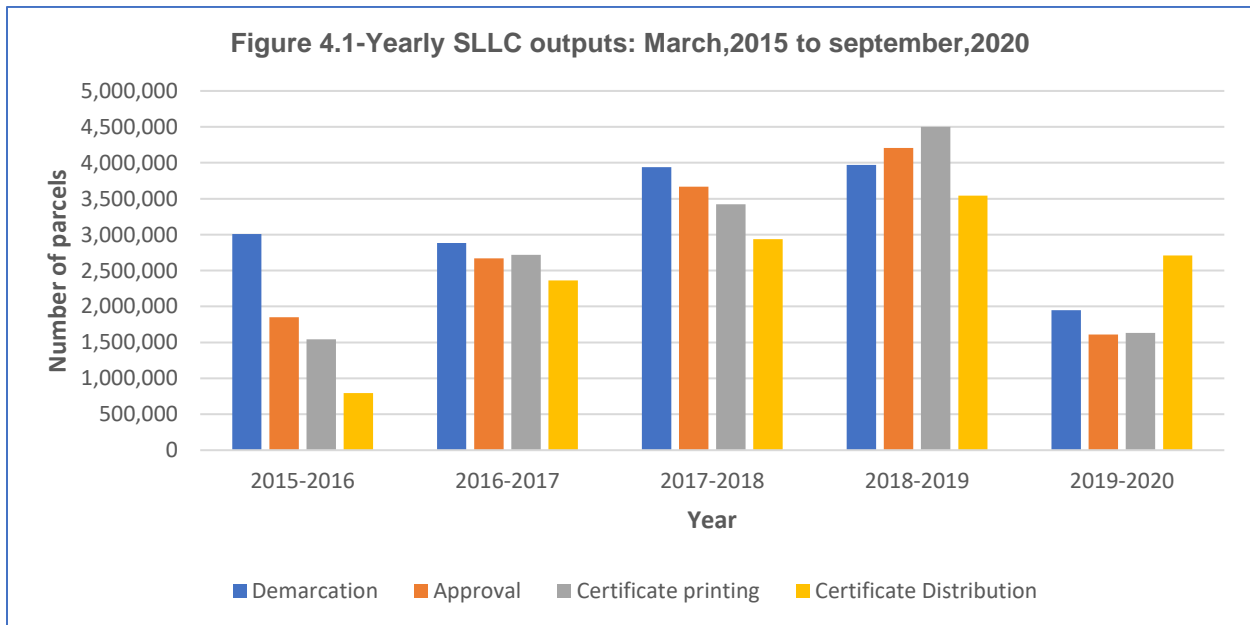


Table 4.4- Comparison of SLLC outputs between LIFT and LTRSP

Program name	Record period (Yr)	Demarcation		Total printed certificates (million)	Certificate issuance			Average Cost/parcel (UK £ /US \$)
		Total demarcated parcels (millions)	Average annual demercation rate (million)		Total collected certificates (million)	Annual average certificate collection (million)	%age of the total printed	
LIFT	5.5 (March,2015 to end of Septmber,2020)	15.8	2.9	13.8	12.3	2.2	89	UK £ 7.0/US \$ 9.1
LTRSP-Phase-II ¹	2.5 (Febraury, 2010 to Augist,2013)	10.3	2.9	8.4	5.7	1.6	68	UK £ 3.7/US \$ 6.0
1-The following data on LTRSP taken from Gillingham,P, and Felicity, B.2014								
*Implementation period: Febraury,2010 to August,2013								
*Total estimated demarcated parcels= 10.3 million								
*Total estimated approved parcels= 8.4 million								
*Total collected leases /freehold titles= 5.7 million								

4.2.3.2-Operational efficiency at the program Woreda level

The actual SLLC operation takes place at the *woreda* level with deployment of all the required resources. The operation at *woreda* level is managed and supervised by the WC. The number of FT and TST staffs/ *woreda* is mainly dependent upon the number of parcels/ programs *woreda*. The efficacy to deliver SLLC outputs/ program *woreda* are mainly influenced by the strength and capacity of the *woreda* level management to monitor the SLLC operation, skill and competence of the trained contract staffs and the level of political support provided by the *woreda* government for SLLC operations. The case is illustrated in Box 4.1 based on two sample program *woredas* from Oromia region.

Box 4.1- SLLC outputs from 2 sample SLLC program woredas: Cases from “Wama Hegelo” and “Degen” “woredas”

“Wama Hegelo” and “Degen” woredas are in Oromia regional state. In “Wama Hegelo woreda”, the total demarcated parcels are about 20,318 which is comparatively low in number compared to other SLLC program woredas supported by LIFT program. While in “Degen woreda”, the total demarcated parcel is about 143,585 with relatively big parcel numbers compared with other SLLC program woredas.

In “Wama Hegelo” woreda, the total estimated time to complete the key SLLC operations (i.e., from organizing public awareness to certificate printing process) took about **19.0 weeks (i.e., about 4.8 months)**. While in “Degen woreda”, it took about **43 weeks (about 10.8 months)** to complete the major SLLC operations (See the table below).

“Woreda name”	Total manpower at “woreda” level		Total demarcated parcels	Estimated time to complete the major SLLC outputs (weeks)				Total estimated time to complete all SLLC operations (weeks/Mn)
	No. of FT staffs	No. of Back Office staffs		Demarcation/ adjudication	Data entry & digitization	Data verification & correction	Certificate printing	
“Wama Hegelo”	40	11	20,318	10.5	8.0	10.0	10	19/4.8
“Degen”	55	19	143,585	33.5	26.5	25.5	27	43/10.8

Better efficiency is recorded in “Degen woreda” with respect to demarcation, data entry and parcel digitization compared to “Wama Hegelo woreda”. The average parcel demarcation rate in “Wama Hegelo woreda” and “Degen woreda” is about 22 parcels/day/team and 36 parcels/day/team, respectively. Factors that attributed for the difference in demarcation rate relate to visibility of parcel boundary lines on orthophoto, topography/terrain, skills of contract staffs and season of the year. In terms of textual data entry and parcel digitization processing, still “Degen woreda” performed better compared to “Wama Hegelo woreda”. Parcel digitization rates in “Wama Hegelo woreda” and “Degen woreda” is about 200 parcels/day/person and 260 parcels/day/person, respectively. The skill and competence of the TST staffs at the Back Office (BO), robustness of the monitoring system and efficiency to delivering the field demarcated orthophoto maps and various registration formats by FT staffs to the BO attributed to the better efficiency in “Degen woreda” compared to “Wama Hegelo woreda”.

In sum, although “woreda-specific” causes for the level of efficiency to deliver SLLC outputs vary from one woreda to another, common factors with determinant on operational efficiency include:

- Number of trained manpower.
- Skill and competency of the trained staffs and turnover of trained staffs.
- Local terrain conditions.
- Effectiveness of the monitoring system; and
- Level of political support by the woreda government.

4.2.4- The Climate Action Through Landscape Management – Land Administration (CALM-LA) Program

CALM-LA is a 5- year large scale land certification program supported by the WB (2019 to 2024). It is designed to improve land tenure security of smallholder farmers and encompassed the following 2 components.

- Issuance of SLLC for 8 million parcels over a period of 5 years in eight regional states (i.e., Amhara, Oromia, SNNP, Tigray, BG, Dire Dawa, Harari and Gambela regions).
- Installation and operation of the National Rural Land Administration Information System (NRLAIS)

The program has been implementing SLLC based on approach and institutional framework developed and used by LIFT program. CALM-LA has a component on installation and operation of a system to register transactions through establishment of the NRLAIS. During 5-year period CALM-LA targeted to install and operate NRLAIS in a total 280 program *woredas*. In doing so, CALM-LA will take over all RLAS program *woredas* supported by SLMP-I/II/RLLP, REILA-I/II and LIFT and will be responsible to install and operate NRLAIS and ensure the sustenance of the system to register transaction in each program *woredas* and establish rural land administration information service. This will be a daunting task given the arena of experiences encountered by LIFT program to improving service efficiency to register transaction on the one side and increase the participation of landholders to register transaction on formal basis on the other side.

As defined in the CALM -LA Project Implementation Manual, the annual demarcation rate target is about 1.8 million parcels/yr. reaching a total of 8.0 million parcels by end of the program, (MoA,2011). Currently, CALM-LA is in its early implementation stage and commenced SLLC operation In November,2019 in 24 program *woredas*. In about 1-year implementation period, CALM-LA demarcated a total of about 1.1 million parcels and currently in a process to print and distribute certificates (See Table 4.5). During the implementation process, sporadic security problems and civil unrest, delays in timely acquisition of the required resources and recruitment of manpower constrained the implementation progress.

In terms of establishment and operationalization of NRLAIS system, CALM-LA prepared and endorsed a Road Map on Rural Land Administration Information System (RLAIS) that encompassed seven sequential phases in order to establish a functional system to recording transactions, increase the awareness level of landholders, establish rural land administration information services and to ensure the financial sustainability of the system (MoA; 2011).Successful achievement of the multiple tasks embedded in the seven sequential phases is a daunting tasks since it requires multiple interventions in areas of legislation and institutional aspects.

SLLC output	Total No. of parcels	SLLC program woredas by region
1-Total demeracted parcels	1,139,926	Amahara= 12 woredas
2-Total approved parcels	401,063	Oromia=5 woredas
3-Total certiifcate printed	396,535	SNNP region= 4 woredas
		Tigray= 3 woredas
		TOTAL= 24 woredas

4.3-Outcome level performance and sustainability

The design of LIFT program is based upon on Theory of Change (ToC) approach based on the standard economic theory model that link title registration and tenure security with investment and agricultural performance. The design of LIFT program features uniqueness from the common land certification programs by inclusion of market interventions in addition to issuance of second level land certificates which is assumed to accelerate the impacts on land investment and income of the rural households. Market interventions included access to credit using the SLLC as a collateral (to address the financial constraints of smallholder farmers), improving rental market and provision of access to improved agricultural inputs. Central in the whole ToC assumption, however, is the functionality of a system to register transactions without which the whole cause -effect relationship unfolds unrealistic. The outcome level objective of LIFT program is “...to bring about changes in investment practices of the rural households through increased tenure security and market interventions”. A recent study carried out in 2020 showed the validity of the assumptions described in the ToC.

The recent SLLC outcome survey study undertaken by LIFT program, among others, shed light on validity of the assumptions embedded in the ToC (LIFT,2020). The study covered 2880 sample households located in 68 LIFT program *woredas* where the Baseline Survey was conducted (LIFT Baseline survey was conducted in 2015). The study showed that risks associated with land loss to be very low, where about 95% of the respondents claimed that SLLC has improved the situation with “low” or “none” risk associated with land loss (as measure of tenure security). In terms of women’s right to land, more than 95% of the sample female household heads and wives in male headed households “strongly agreed” as a rightful landholder of a holding post-SLLC period compared to pre-SLLC period. The study also showed significant reduction in land dispute cases, where land related disputes during post-SLLC survey period (i.e. 2 years after SLLC) compared to the Baseline time (i.e., 2 years before the Baseline survey), dropped by half with an estimate at 4.2% and 9.6%, respectively. With respect to linkage of tenure security with investment on land, about 93% of the respondent landholders increased investment on their land (i.e., both short term and long-term investment) in at least one investment type post-SLLC. The most frequent short-term investment types include the use of fertilizers, planting high value crops and use of improved seeds, while the common long-term investment types include environmental conservation measures (e.g. application of organic fertilizers, plating perennial trees, etc).

Chronic challenges remain to keep the land record up-to-date and current, where sustaining a functioning system to register transactions, informality in transfers and cost-recovery mechanisms to cover the operating cost for services to registering transactions are at stake. From 2016 to September 2020, LIFT in coordination with the regional and *woreda* governments, installed and operated a system to register subsequent transactions in 127 program *woredas*. Inefficient service provision by the WLOs on the one side and low participation of landholder to register transactions on formal basis on the other side is prevalent problem in several programs *woredas* supported by LIFT. The lack of required resources, waxed and waned political support by the government for functions to register transfers, lack of coherence to integrate the business process to registering transaction and frequent turnover of the trained staffs attributed for inefficiency in service provision by the WLOs, which is one of the core public service at the “*woreda* government” level. Informality in transactions is considerably high. A survey undertaken in 2019 that covered 49 LIFT program *woredas* showed that with exclusion of transfers through “sharecropping”, only about 32% of all transaction types (i.e., credit, rent, inheritance, gift, etc) are registered formally with about 68% taking place on informal basis (LIFT, 2019b). While in case of SLMP-I/II/RLLP, functions to register transactions are completely vested upon the responsibility of the regional and *woreda* governments.

With regards to cost recovery strategy, there is no any policy directions on cost recovery mechanisms to cover the recurrent cost for services to registering transactions. A study on financial sustainability of the RLAS flagged two key revenue generating strategies to recovering about 76 % of the total recurring cost

for services to registers transactions in the medium-term period: revenue from transaction fees and revenue from land administration services (LIFT, 2017d). The study flagged a number of interconnected measures to realize the above two key revenue generating strategies. These include development of legal framework, preparation of business processes and increased participation of landholder to register transactions on formal basis. The implementation of the above necessary conditions takes considerable time, however. Until then, the regional and *woreda* governments should continue to support all the required budget to cover the recurring cost for services to register transactions (LIFT,2017d).

Maintenance of land registration system is a pervasive problem in several land titling program, typically in Africa and the problem persistent for decades. Ethiopia's experiences with the FLLC showed similar scenario (USAID,2004; Gizachew, A; Tony and Tigistu, G/M,2013 and Deininger et al,2007). In Rwanda problems to keep the land registry updated is pervasive (Trustee of Princeton University,2017; Gillingham, and Felicity, B, 2014). In Rwanda, delayed preparedness to develop a system to register transaction, higher transaction fee rates, inefficient service provision and lack of awareness, among others, continued to be key challenges to keep the land record updated (Trustee of Princeton University,2017; Gillingham, and Felicity, B, 2014; Ali, D.; Klaus. and Marguerite, 2017). Factors related to regulation, limited awareness level and high cost of registering transactions are cited as key impediment for widespread informality in rural Rwanda, which undermined gender equity, investment, and land market benefits of the land tenure regularization program (Ali, D., Klaus. and Marguerite, 2017). In Rwanda, transaction fees are exorbitant, where in Mid-2017, for notarization of sales agreement or other contracts, printing of new title documents and the registration of transaction cost totals about US \$ 35 (Trustee of Princeton University,2017). This fee rate is affordable in urban Kigali, where land values are high but prohibitively expensive in rural areas (Trustee of Princeton University,2017). A recent information released by the Economist stated that about 87% of rural land transactions in Rwanda is informal and mainly related to high cost to register transfer through sales (The Economist,2020). Another classic example is the case in Kenya with an extensive experience in land registration program in Sub-Sharan Africa. In Kenya, the land registry record has become outdated due to the widespread failures to register transfers and successions, where most transactions taking place in accordance with indigenous practices rather than the statutory law (Migot-Adholla,S.E., Place.,F., and Oluoch-Kosura,W.;1994).

Ensuring the financial sustainability of the land registration system is another key and prominent problem area. In Rwanda, the financial sustainability to cover the operation cost to maintain the land record is another challenge where still donor support to the government to establish a functioning system is ongoing for extended period (Trustee of Princeton University,2017; Gillingham, and Felicity, B, 2014).

4.4-Synthesis of the output performance

Performance comparison across the four rural land administration programs is indeed a difficult task due to huge variation among programs with respect to the program design and components, program focus area and resources allocated. To do so will be like comparing “apples with oranges”. A realistic projection of time frame to complete SLLC coverage for an estimated total 50 million parcels owned by smallholder farmers is difficult task given limitation in resources, the fragmented nature of SLLC operations by different programs coupled with lack of country-wide Road Map on Rural Land Administration System. Considerable challenges remain to prevent the erosion of the massive SLLC data base created and established by multiple rural land administration programs. The synthesis below highlights the overall SLLC performance of the four rural land administration programs, the projected time frame to certify the remaining 30 million parcels and the key challenges to keep the land registry record updated and current.

All the four programs somehow achieved their annual SLLC output targets in most of the years in terms of parcels demarcated and certificates issued to landholders. Efficiency level measured by demarcation rate, certificate issuance rate and cost/parcel, however, showed a marked variation among the four programs (See Table 4.6). Certificate issuance rate from the total demarcated parcels by REILA-I / II and SLMP-I/II/RLLP stands at 69 % and 58%, respectively, which is relatively low compared to LIFT program. The other jigsaw is the approach used to estimate the cost/parcel by each program which is variable among the programs. The cost/parcel with REILA-I/II LIFT and CALM-LA is about USD\$ 11/parcel, USD \$ 9.2/parcel, and USD \$8.25/parcel, respectively. The inconsistency in the approach used by different programs (i.e., the specific costed items and the technique for costing of each item) makes inter-program performance comparison difficult if not impossible. A bit more detailed standard cost/parcel estimate is calculated by REILA-I which costed the main SLLC operation, however, needs reverifications on costing technique used to estimate fixed items and management cost. That notwithstanding the cost/parcel from demarcation process to certificate printing is estimated at about USD\$ 8.5/parcel (Zerfu and Harris,2013).

In terms of demarcation coverage, the four programs covered significant parts of the highland parts of the country inhabited by smallholder farmers. In a space of about 12.5 years, nearly a total of about 20.3 million parcels demarcated and second level certificates issued to 14.6 million parcels. The overall certificate issuance rate is monumental, where about 72% of the total demarcated parcel is issued (See Table 4.6). A realistic projection of time frame to complete SLLC operation for a total of nearly 30 million uncertified parcels needs a judicious judgment considering the purpose and design of the existing rural land administration programs, the SLLC component of each program, resources allocated for SLLC component by each program, performance level of each program and availability of additional resources. Nevertheless, due to the comparative advantages of LIFT and CALM-LA programs in terms of SLLC operation and similarity in approach and institutional framework to implement SLLC (i.e., on the average of about 24 SLLC program woredas/yr.), it may be realistic to assume that the GoE may scale up the SLLC operation based on the approach and speed undertaken by these two programs given resources are not limiting. The above assumptions valid, taking the annual demarcation rates of the two programs, it may be realistic approach to estimate the time frame required to complete SLLC operation for the remaining 30 million uncertified parcels. Thus, with annual average demarcation rate of about 2, 332,025 parcels/yr., about 13 more years is required to certify the remaining 30 million parcels owned by smallholder farmers.

Critical concerns and at the heart of all the four rural land administration program is the challenges to keep the land registry record up to date which is populated with massive one-off SLLC database and realize the expected medium- and long-term benefits. Sustenance at two main fronts stands critical: a) Sustaining a functioning system to register transactions and increasing the participation of landholder to register transactions; and b) Realization of the outcome and impact level objectives of the programs. Maintenance of the massive SLLC detail database is a huge concern requiring long-hauling efforts which demands multiple interventions with respect to institutional and financial aspects on one hand and increasing the awareness level of landholders to register transactions on formal basis on the other. Rural land

administration programs are not only land certification process, *per se*. The core objectives entail increasing investment on land, improved environmental conservation, and increased incomes where its realization involve access and functionality of a web of market factors (i.e., capital, labour), access to improved agricultural technology and extension service. For example, in a situation where access to improved agricultural technology is limited and supply of agricultural chemicals (i.e., fertilizer, herbicides, etc.) is in shortage or with unaffordable price undermine the expected impacts to be derived from improved tenure security. Henceforth, the need to continuously monitor the SLLC performance output towards achieving the long-and medium terms objectives are of a paramount importance. This underpinning the need to undertake systematic evidence-based surveys to rigorously check and validate the assumptions embedded in the ToC. Continues empirical research on the above should be an in-built homework besides to the conventional Mid-Term evaluation or Post-Project evaluation exercises.

SLLC output	SLMP-I &II/RLLA	REILA-I and II	LIFT	CALM-LA	Total
1-Demarcation					
1.1-Total demeracted parcels	2,225,466	1,169,147	15,752,269	1,139,926	20,286,808
1.2-Average annual demarcation rate	227,088	179,869	2,864,049		
2-Certiifcate distribution					
2.1-Total certificate distributed	1,538,849	682,277	12,349,737		14,570,863
2.2-Average annual certiifcate distribution	157,025	104,966	2,245,407		
2.3-%age of certificates distibuted from the total demarcated parcels	69	58	78		72
3- Cost/parcel	No data	a)EUR 3.81 in Amahara & EUR 14.2 /parcel in BG;b) Cost/parcel based on cost break down= US \$ 8.5/parcel	a)4-year average (2016 to 2019)=UK £ 7.0/certiifcate (US \$ 9.2/parcel)	US \$ 8.25/parcel	

5-CADASTRAL SURVEYING AND MAPPING METHODOLOGY FOR RURAL LANDS

In a process to upgrade the FLLC with SLLC, where the latter require a georeferenced cadastral map significant effort were undertaken to select the appropriate cadastral surveying methodology for rural lands of Ethiopia. The tasks have been challenging given the legal caveats on policy directions with respect to “accuracy standards” applicable for rural lands of Ethiopia. The process to undertake cadastral surveying of rural lands was initiated as early as in 2002 with selection of two pilot *woredas* in Amhara regional state with support from the Swedish International Development Agency (SIDA). In the piloting exercise, “Total station” and “Precision-GPS” were used to undertake cadastral surveying which latter translated to other *woredas* in the region. Thereafter efforts continued to search for appropriate cadastral surveying techniques with support of different donor agencies. Purpose, cost, and practicality are critical elements to determine the best fit cadastral surveying and mapping approaches. This section pieces together the multiple trials and research undertaken by multiple programs with support of different donor agencies to choose the appropriate cadastral surveying approaches for the rural lands owned by smallholder farmers.

Provisions contained in the Federal Rural Land Administration and Use Proclamation lacked clarity on accuracy standards. Relevant broad provisions in the proclamation include (FRDE,2005):

Art. 6 (2): “Rural landholdings described under Sub-Article 1 of this Article shall be measured by competent authority and shall be given cadastral map showing their boundaries.”

Art.6 (3): “Any holder of rural lands shall be given holding certificates to be prepared by competent authority and that indicates the size of land, land use types and cover, level of fertility and borders, as well as the obligation and right of the holder.”

The above provisions reflect more like a legal cadastre with a purpose to ensure that all parcels are shown in their correct topological relationship and their boundaries and areas are determined to a ‘reasonable degree of accuracy. The above notwithstanding, the push to implement the SLLC was triggered with endorsement of the country’s 5- year Growth and transformation Plan-I (GTP-I) and the subsequent study tours to Rwanda to experience the country’s land certification program. The federal GTP-I as a frame, the Amhara, Oromia, SNNP and Tigray regional states prepared region-specific GTP and each region targeted to complete SLLC in their respective region within the plan period (Tigistu, Gizachew, Bennet,2013). Accordingly, from 2012 to 2014, the four regional states, invested about USD\$ 3,350,000 to acquire orthophoto which triggered the wider use of orthophoto for undertaking cadastral surveying of rural lands. Prior to the selection of orthophoto and HRSI for undertaking the larger scale second level certification programs, however, multiple pilot trials have been undertaken by different rural land administration programs supported by different donor agencies. The results from the pilot trials provided a robust information, among others, on cost related information for different cadastral surveying techniques.

The two successive rural land administration programs supported by the United States Agency for International Development (i.e., Ethiopia-strengthening Land Tenure and Administration Program (ELTAP-2005-208) with a follow up of the Ethiopia – strengthening Land Administration Program (ELAP- 2008-2012) initiated a series of studies to select the appropriate cadastral surveying methodologies. Lately, between 2011 to 2013 REILA-I project in coordination with the GoE initiated a trial on photogrammetric approach (i.e., both Orthophoto and HRSI) after a study tour to Rwanda.

The ELTAP (ELTAP-2005 to 2008) and the successor ELAP (ELAP-2008 to 2012) undertook multiple trials on different field surveying and photogrammetric approaches in order to choose the appropriate cadastral surveying methodologies for rural lands. Among others, the two sequential programs undertook studies that compared the cost/parcel using HRSI and total station. The results are shown in Tables 5.1 and 5.2.

Table 5.1- Cost estimate using Total Station and HRSI: Trail conducted in "Bole ' kebele located in Alem Gena woreda of Oromia region (ELAP,2011)

Cost item	Total station (USD\$)	HRSI (USD \$)	Remarks
1-Total labour cost (Field + office works)	595.3	254.6	
2-Total cost of equipment	294.6	1864.9	a)Orthorectified IKONOS HRSI with 1.0 resolution covering 49km ²
3-Total cost of supplies	152.5	18	
4-Total transportation cost	77.4	51	
5-Total cost	1119.8	2188.5	
Average Cost/parcel	7.3	14.2	
Average cost/ha	13.5	26	b)Orthorectified Image cost: USD\$ 49/Km ²

The two sequential studies undertaken by ELTAP/ELAP (ELAP: 2011, 20012) used the same approach to estimate the cost/parcel, where labour, equipment, supplies and transportation cost items are the key cost elements considered. In both studies, the labour cost to install the 2nd order Ground Control Points (GCPs) were considered. The cost/parcel using IKONOS, World View-II and GeoEye-II HRSI range from USD\$ 12.70 to USD\$22,5/parcels. The study area coverage, the acquisition mode of the HRSI (i.e. new collections vs imagery from archives), the terrain conditions and ease to identify the parcel boundaries influenced the variations in cost/parcel. The lion share of the total cost is associated with acquisition of the HRSI, which range from 33 to 85% of the total cost. The cost/parcel using HRIS to be tremendously reduced with economies of scale and if the cost shared by different user organizations.

Table 5.2- Cost estimate using Total Station and HRSI (ELAP,2012)			
Cost item	Total station (USD)	HRSI (USD \$)	Remarks
a)Result from "Yergen Kebele" in Amhara region			
1-Total labour cost	1410	811.2	
2-Total cost of equipment	827	676.5	
3-Total cost of supplies	237.9	307.2	a)World View-II with 0.50m resolution
4-Total transportation cost	358.4	274.4	b) Rraw imgae from the archives= USD\$ 17/km ²
Grand Total	2833.3	2069.3	
Average Cost/parcel	17.4	12.7	c)Additional cost incurred for orthorectification process: Additional USD \$100 to locate GCP points for orthorectification
Average cost/ha	22.2	16.2	
b)Result from "Tseaga Kebele" in Tigray region			
1-Total labour cost	1362	624.5	a)Geo Eye-I: HRSI with 0.50m resolution with an image area of 81 Km ²
2-Total cost of equipment	827	2958.9	b)New collection : USD\$ 22/Km ²
3-Total cost of supplies	95.7	307.2	
4-Total transportation cost	354.5	188.1	
Grand Total	2639.2	4078.7	
Average Cost/parcel	14.6	22.5	c)Additional cost for orthorectification process: USD\$ 100 for orthomosaicing & USD\$100 for idenfiaction of GCP points for orthorectification
Average cost/ha	27.7	42.8	

Comparison of cost/parcel using total station and HRSI showed variable results. In two study sites (i.e. "Bole Kebele" in Oromia region and "Teaga kebele" in Tigray region), the cost/parcel using HRSI is higher than using total station. The primary reasons for higher cost using HRSI is linked to acquisition mode of HRSI, area coverage and orthorectification process. The cost to be tremendously downsized if used for large area and availability of GCP for orthorectification process.

There is very limited study on orthophoto cost/parcels for undertaking cadastral surveying and mapping of rural lands. Zerfu and Harris (2013), however, estimated the average cost/parcels based on 4 trail sites located in Amhara, Oromia, SNNP and Tigray regional states. Based on this study, the average cost/parcel using orthophoto is estimated to be USD \$ 8.5 /parcel. CALM-LA program, however, used a unit price of USD\$ 8.25 /parcel to estimate the budget requirement for undertaking SLLC by CALM-LA program ((MoA,2011).

A recent study by LIFT underlined the potential use of HRSI from the Digital Globe (i.e., Worldview-3 and 4 satellite imagery) for undertaking SLLC, however, pending piloting trials to verify the positional accuracy of both the currently widely used orthophoto (i.e., Spatial resolution of 25 to 40 cm and with estimated CE of 73cm at 95% confidence level) and World view 3 and 4 imagery with 31cm resolution (LIFT,2017). Further, the study suggested that, HRSI at 0. 40cm resolution or better could save some cost and minimizes some of the logistical and administrative obstacles to procuring and processing aerial imagery in Ethiopia. Based on selected sample area, the study indicated that the cost using Worldview -3 imagery from the Digital Globe is less by 9 % compared with the currently widely used orthophoto by LIFT (See Table-5.3). Comparison on spatial/temporal resolution, spatial accuracy, and cost of the currently widely used orthophoto used by LIFT and Worldview-3 imagery is shown in Table 5.3.

Table 5.3- Comparison of Orthophoto used by LIFT with Digital Globe WorlView-3 imagery

Requirement Comparison of Imagery Specifications:	LIFT Requirement Orthophotos	Digital Globe Offering Product Characteristic
Spatial Resolution	30cm	31cm
Spatial Accuracy	CE 73.2cm at 95% confidence level	RMSE 2m, CE 3.035m at the 90% confidence level, and 3.462m at the 95% confidence level
Source of DEM	Stereo airborne imagery	Off the shelf 5m DEM from JAXA ALOS stereo satellite imagery
GCP collection	EMA (cost included in price below)	EMA (cost included in price below)
Imagery Collection	New	New and archive from no older than two years
Cloud cover	Less than 5%	Less than 5%
Spectral Resolution	Three bands: red, green, blue, infrared (not delivered to LIFT)	Four bands: red, green, blue, infrared
Cost	£21.00/km ² (630 ETB)	£19.16/km ² (575 ETB)

Source: LIFT (2017)

In conclusion, both orthophoto and HRSI are the preferred and “Fit-for -Purpose” techniques for undertaking large-scale certification of the rural lands in Ethiopia given the very broad objectives and the principles of general boundary approach. Photogrammetric approach is “Fit-to-Purpose” for initial compilation of massive spatial framework data sets and achieve the broadly defined objectives as defined in the Federal Rural Land Administration and Use Proclamation (FDRE,2005). This is in accord with “Fit- for -Purpose” approach where, among others, the purpose is the key determinant factor for defining the accuracy standards rather than setting a rigid high standard of accuracy which is not only unnecessary but unattainable and costly impeding the implementation process (Enemark,2017). Photogrammetric approach, however, is less suited for recording maintenance and setting out new parcels due to sub-division process.

6- CHALLENGES, EXPERIENCES AND LESSONS

6.1-Challenges

Notwithstanding the impressive achievement recorded in SLLC performance, a myriad of challenges appeared during implementation process which include issues related to legal framework, organizational aspect, SLLC processes and design of rural land administration programs. The gravity of the problem varies from one program to another, however. The challenges with respect to maintenance of land registration system is hanging in balance all the expected benefits to be derived from the SLLC which is a universal problem to all rural land administration programs. The key challenges and issues encountered during SLLC implementation process and maintenance of land registration system is encapsulated below.

6.1.1-SLLC

a) Legal provisions on procedures that governs key SLLC processes: The existing rural land administration legislations lack the details on key policy directions that governs the key process related to adjudication and demarcation, data verification and corrections and certificate issuance. Among others, key legal caveats include:

- Registration of encumbrances and servitude.
- Registration of polygamous and deceased household.
- Accuracy standard for cadastral surveying and mapping.
- Data quality assurance/quality standards.
- Registration of communal lands.
- Procedure for managing PD events.
- Legal content of title certificates.
- Etc.

Lack of clear policy directives on the above and others, among others, undermined the clarity to recording the tenure rights of the disadvantaged social groups and resources under communal tenure regimes. This aspect not only undermined the process to ensure the rights of the disadvantaged social groups and resources under communal tenure but triggered land related conflicts undermining the over SLLC operational efficiency and effectiveness. Another challenge is the long debated but still the uncodified accuracy standards for surveying and mapping of rural lands. The current de facto orthophotos techniques used for SLLC still lacks specifications on accuracy standards and the current widely held views on high level positional accuracy with limitations to relax the accuracy options that still fits the purpose.

b) Government political support and ownership: In general context the regional and *woreda* governments provided a strong political support during SLLC implementation process which resulted in improved operational efficiency. Nevertheless, the following challenges prevailed:

- Inconsistent and wavy political support to SLLC operations partly caused by engagement of government offices in multiple priority political works and lack of complete awareness on the benefits of certification programs. Large scale certification program demands for strong and proactive government support during implementation of the series of interlinked SLLC activities.

c)Organizational aspect: The large-scale certification program implemented by LIFT and CALM-LA programs deployed a massive cadre of sub-professional staffs, each program deploying around 1500 trained sub-professional staffs through provision of an in-house intensive short-term trainings. Although graduates at mid-level professional grade are available in -country, the following key challenges remains as key bottleneck:

- Frequent turn over the trained staffs and delay in recruitment process and training of the new staffs, which is a perennial challenge.

- Lack of sufficient budget by the regional and *woreda* governments to support SLLC operations, for interventions which are not financed by donor supported programs; and
- Delays in timely supply of the required inputs and supplies with severe impacts on timely delivery of SLLC outputs.

d) Process -related: Challenges and issues linked to SLLC process are not standalone issues but linked with existing legal caveats. For processes to be effective, they should be backed up and supported by adequate and clear legal framework. Outstanding challenges and issues include:

- Lack of detailed procedures that governs the key SLLC processes including adjudication and demarcation, data verifications and correction and certificate issuance.
- Lack of systemic and robust procedures to check and monitor quality control/quality assurance for series of key interlinked SLLC process.
- Lack of standards on cost/parcel which makes SLLC performance comparison across programs difficult and inconsistent. The current estimate on cost/parcel is variable across programs (i.e., REIALA-I and II/ LIFT/CALM).

e) Program design: The key challenges and issues related to program design include:

- Program's' Incompleteness in land certification coverage in program *woredas* may result in antipathy by segment of society which are uncovered by SLLC and difficulty to capture transactions in program *woredas* with partial SLLC coverages.
- The fragmented nature of land certification operations under different programs without considering comparative advantage as an important criterion.
- The lack of an up-to-date country-wide Strategic Road Map on Rural Land Administration System, which should anchor policy directions on overall goal, strategy, priorities, and sequence of SLLC operation to cover SLLC operation at the country -wide level and actions to derive the multiple benefits from the system.

6.1.2-Maintainance of land registration system

Maintenance of land registration system is a hallmark to derive all the expected short and long-term benefits from the massive SLLC investment. The challenges on maintenance of land registers are not program-specific but prevalent across programs. Inefficient services to update transactions and informality in transaction are pervasive challenges threatening the overall benefits to be derived from the massive SLLC data which is generated with massive resources and investment. Notable challenges include:

a) Legal caveats: Existing legal framework lacks policy directions on the following key important aspects and issues.

- Appropriate incentive strategies to incentivise landholders to register transactions on formal basis.
- Roles of customary institutions in a process to transfer different transaction types.
- Designation of legally responsible Registration Officers at different government levels for overseeing, reviewing, and approving land transactions.
- Absence of policy directions on cost recovery mechanisms to enable recover the recurring cost for services to recording transactions.

b) Service provision to recording transactions: Inconsistent and wavy political support and lack of strong ownership to functions related to registering transactions by the government coupled with insufficient resources allocated undermined the operational efficiency to maintain the land registers with high risks on overall sustainability of the system. The readiness of the government to internalize the operation post-withdrawal of the support by different donor-supported programs is outstanding challenges. The specific challenges include:

- Inconsistent and wavy political support by the government to institutionalize a functioning system to record transfers.
- The lack to integrate the business process of land transfers as core and priority functions of the WLOs.
- The inability of the regional and *woreda* governments to allocate sufficient resources including manpower and budget for services to recording transfers, which is one of the core public service at the *woreda* government level.
- Frequent turnover of the trained staffs, the problem linked with overall organizational culture, structure, and functions.

c) Informality of land transfers: A complex web of factors caused for land transfer to be undertaken on informal basis and significant volume of transactions taking place without recognition by land offices. Key challenges include:

- Lack of awareness by landholders on the benefits and procedures related to different land transaction types.
Existing customs and cultures.
- The high cost involved in processing transactions due to poor services and frequent back-and-forth travels to service providers.

d) Program design: Key challenges and issues related to program design include:

- During design, some programs' lack completeness in SLLC coverage in program *woredas*, which poses difficulties to capture all transfers leading to gradual erosion of the cadastral data sets. Although this may be reasoned from the core design objectives and focus area of the program (i.e., improved watershed management as a focus area of the program or program's resources limitation), this does not justify the inclusion of SLLC in program design without being complemented with a strong component on maintenance of land registry record.
- Programs with maintenance of land registration system as a component limit the intervention support on capacity building to increasing the skill and capacity of individual staffs of the WLOs with less focus and attention to the whole organizational capacity building process.
- Program's focus and bias towards land certification component with lessor emphasis and under resourcing the component on maintenance of land registration system.

6.2- Lessons learned

Extensive lessons are drawn from massive experiences with respect to design and implementation of SLLC and maintenance of registration system from four key rural land administration programs. The lessons synthesised illuminate weaknesses and strength with strong bearing on performance, outcome, and impacts.

Most of the lessons related to program preparation and design are generic in nature and therefore with broader applications and transferability to other counties with slight modifications to fit in the local conditions and context. Significant number of the lessons associated with implementation process are cost-effective by nature and results in quick wins and therefore with high potential of transferability to other counties where demand exist to undertake large scale certification programs in areas characterized by sedentary agriculture.

6.2.1-SLLC

a) Legal aspect

- ***Elaborate and detailed legal framework is central for effective implementation of land certification programs:*** Framework land laws should be supported with detailed regulations,

directives, acts or others that shall elaborate key processes that governs adjudication/demarcation, data verification and corrections and certificate issuances. In counties like Ethiopia, where there is already a wealth of evidence on SLLC implementation process, the accumulated knowledge could be easily untapped to crafting and codifying detailed legislations gaps and does not necessarily require the usual piloting trails.

- **Photogrammetric approach is “Fit-for- Purpose” approach for large scale certification programs:** Photogrammetric approach is cost effective and “Fit-for-Purpose” for large scale land certification programs due to economies of scale given parcel boundaries are air-visible and detectable. It is fit for land certification program where general boundary approach is adopted and the requirement for high level positional accuracy to be considered when only the need and demand arises.

b) Increased political support and ownership by the government

- **Incentives as one the critical factors to Institutionalize land certification process by government:** The SLLC implementation process is undertaken by programs teams and government offices at different administrative levels, the government as a lead and owner of the program. For the government to own the land certification process, it is critical to organize a regular and systemic awareness raising programs tailored to government decision-makers at every level. Sermons such as high level of statement of endorsement and advocacy about land certification program by high-ranking government officials such as ministers, regional presidents/vice-presidents incentivise to institutionalize the process. Another important lesson is having a powerful champion with good background and knowledge on processes and benefits of SLLC operation who can take initiatives to institutionalize SLLC operations by the government .

c)Organizational aspect

- **Clear understanding on responsibility shares of the program teams and government offices:** Lack of complete understanding on responsibility shares of the program teams and government offices at different administrative level often leads to institutional turf impeding the effective delivery SLLC outputs. Organization of serious of awareness raising workshops to decision -makers is one of the necessary conditions to establish a common understanding about the responsibility shares of program teams and government offices at different levels.
- **Incentive to minimize the turnover of trained staffs:** Workable incentive mechanisms such as staff promotion, award letter as recognition of good performance and annual salary increment based on performnace merit are viable incentive means to minimize the frequent resignation of trained staffs.
- **Training of Trainers (ToTs) approach as best training approach for large scale certification program:** The implementation of large-scale certification program in countries with large land size area like Ethiopia, centralized training approach is ineffective approach to continuously train, re-train and build the manpower capacities of government staffs working at different administrative levels. The Training of Trainers (ToT) approach with cascading training modalities is ideal and effective to continuously build the manpower capacity of government offices at different administrative levels.

d)Process-related aspects

- **Continuous development of procedures for processes which are unclear and vague:** During SLLC implementation process, there are processes and issues which lacks detail procedures and guides. Neither the existing legal framework with sufficient details to provide clear guides. Therefore, it is very important to continuously prepare guideline for processes and issues which are opaque based on feedbacks from implementation processes. In this connection, the original SLLC manual published by LIFT in 2014 have been revised five time after its first publication.

- **Systems for quality assurance/quality control mechanisms:** In countries where there are no licenced private organizations or licenced individuals to undertake quality assurances/quality control and resources is very limiting, it is more realistic to design and implement an in-built process-based quality control /quality assurance mechanism to maintain the standards for key SLLC process ranging from public awareness to issuance of certificates to landholders.
- **Systematic monitoring to tracking the performance of the sequence of SLLC processes:** SLLC embed a series of processes, where an output from one process is an input to the next one. The framework of SLLC monitoring system should be robust in nature to track each key process in the process-chain to achieve efficiency and effectiveness.
- **Standards on cost/parcels for certificate issuance to compare performance among programs:** The cost/parcel as measure of cost efficiency is variable among programs. It is necessary to standardize the methodology on cost/parcel so that sound performance comparison can be possible between programs. The items to be costed and method to costing each item should be based on standard and acceptable norms.
- **Demarcation process based on orthophoto techniques requires less skilled professionals:** Demarcation based on orthophoto techniques can be adequately and effectively accomplished with sub-professional grade level staffs with provision of intensive in-house training. It does not require high grade professional staffs trained in proper surveying, geodesy, and others field of specialization.
- **Resource allocation based on performance rather than solely on equity criteria improves the overall SLLC performance efficiency:** Programs/project with SLLC component, the allocation of resources for SLLC operations for regional governments based solely on equity principles (i.e., based on the government budget allocation formula which is based on equity between region or other equity-based criteria) will compromise effectiveness in delivering SLLC outputs. Although equity criteria should be used as one criterion to allocate resources, performance efficiency and cost/parcel should be considered as an additional criterion to allocate resources to regional governments than solely equity principles to incentivise both poorly and better performing regional government and improve the overall efficacy.

e) Program design

- **Land administration programs with land certification components should ensure completeness in SLLC coverage in program woredas:** Programs with land certification component should ensure completeness in SLLC coverage in each program *woredas* to avoid disfranchising a segment of the local communities which are left out from certification process and to enable capturing all the transactions across *kebeles* within program *woredas*.
- **Country-wide programs on land certification should consider comparative advantage criteria when designing programs:** Design and implementation of a fragmented land certification interventions under different programs supported with different donor agencies not only undermines the efficiency to achieve country-wide SLLC coverage but introduces inconsistencies in implementation procedures and modalities. All programs with SLLC component embedded should be designed under one bigger umbrella land program with creation of basket fund from different donor agencies to foster efficiency and effectiveness than being fragmented under different programs supported by different donor agencies.
- **Land certification programs should embed strong component on maintenance of land registration system:** As land administration system is about processes and systems, land certification programs should encompass a strong and well-designed component on maintenance of land registration system. Programs which embed land registration maintenance as a component should allocate sufficient resources for the system to be anchored and institutionalized by the government. Failures to do is a waste of all the huge resources invested to generate the massive one-off SLLC data base.

- **Preparation of country-wide Strategic Road Map on Rural Land Administration System:** Preparation of a country-wide Strategic Road Map on Rural Land Administration System based on existing robust experiences from rural certification programs or piloting trials is critical element to define the specific goals, strategies, priorities and to effectively reap the expected benefits from the system. Indeed, the road map should map out strategic directions, prioritize intervention areas, harmonize fragmented programs, and set out strategies and actions to achieve the short- and long-term benefits from the system to ensure efficiency, effectiveness, and sustainability.

6.2.2-Maintenance of land registers

The values of land registers are dependent upon maintenance of land registers and failure to do so results in wastage of all the resources invested to generate the massive one-off SLLC database. Establishment and operationalization of a functioning system to recording transaction on one side and motivation of landholders to register transactions on the other is central and necessary condition to derive all the benefits from SLLC operations. Lessons from the experiences cover wide areas ranging from legal aspects and program design to establishing and operationalizing a functioning system to record transactions.

a) Improvement in legislation frameworks: Existing legal frameworks should be detailed to provide policy directions on registration of transfers and cost recovery mechanisms to ensure sustainability. Among others, existing legislations should encompass the following key elements:

- Principles of title registration (i.e., guarantee/insurance principle as in case of Title registration).
- Transaction procedures for key transaction types.
- Designation of legally responsible individual at different administration level for processing and managing transaction processes.
- Incentive mechanisms to motivate landholders to register transactions on formal basis.
- Cost recovery mechanisms including transaction fee structures to cover the operating cost for services to record transactions.
- Etc.

b) Increasing demands on the benefits of land registration maintenance by higher level decision-makers: The following two interconnected incentive related measures, among others, are important necessary conditions to institutionalize the system by the government:

- Lack of awareness on the benefits of land registration maintenance is one of the key barriers to internalize the system. Organization of a series of awareness raising training targeting ONLY decision-makers should be one of the core interventions to increasing the demand by the government at different administrative levels.
- Promoting and supporting interventions that support local efforts to increase revenues from the rural land administration information system is an excellent entry point with enormous influence in creating the demand from the government side. For example, information required by tax authorities are part of the rural land administration information system and could be easily used by rural land tax authorities for collecting tax revenues with establishment of “interim procedures” on rules and guidelines on customization of the data sets as required by tax authorities, data standards (data and metadata), organizational coordination and partnership and others. Increased financial revenues from land administration information system attracts decision-makers to support and internalize the system.

c)Organizational capacity building is well beyond the training of individual staffs; The trend to limit capacity building to training of individual staffs of the WLOs without a concomitant intervention to build the organizational capacity of land offices will bear little or no benefits. The productivity of well-trained individual staffs is determined by enabling environment prevailing at the organizational level.

Improving the services to recording transfers should encompass capacity building process both at the organizational and individual levels. Capacity building interventions limited to enhancing the skills of individual staffs risks the purpose of achieving efficient services to recording transactions Capacity building at the organizational level should aim to address multiple dimensions including organizational vision and

strategy, organizational culture, structures, and business processes related to recording land transfers based on through organizational capacity building assessment.

d) Cost recovery strategy to cover service cost to recording transfers is one of the necessary conditions for substantiality

- Designing context-specific and evidence-based cost recovery strategy and the same to be backed up by legal frameworks are critical success factor to ensure the financial sustainability of the system.
- Interventions to establish a cost recovery strategy is not an intervention to be planned and implemented at the end of the program's lifetime but rather at the start of the program as it requires multiple legal and institutional interventions to realize the cost recovery strategy.
- Existing local practices, where rural land administration information is used to generate revenues such as by tax revenues authorities, should be consolidated and expanded via piloting trails supported by "interim Procedures" is one of the key lessons which shorten the pathway to internalize the cost recovery strategy by the government. The above non-linear pathway based on capitalization of the existing informal practices than the conventional step-by-step path will expediate the process of revenue generation to the government from the rural land administration information system within a relatively shorter period.

d) Program design

- **Land certification program should embed a strong in-built component on land registration maintenance and not limited to land certification alone;** Land administration system is a process and system and limiting land administration program to land certification component alone or designing under resourced and understaffed component on functions to registering transfers is equally a faulty program design with high risk of failure and a repeat of decade old problem.
- **Reality check on validity of the assumptions embedded in the ToC:** Current available local evidence shows the validity of the assumptions embedded in the ToC; a model that link tenure security, investment and agricultural production and productivity. Given the multiple factors at play for the assumptions to hold true, it worthwhile to continuously check and monitor the validity of these assumptions under local circumstances based on sound empirical surveys and research. Empirical evidence on the above not to be limited to the conventional Mid-Term and Terminal evaluation reports.

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