

Chapter 1 Introduction

1.1 The Mandate of the Ministry

The Ministry of Lands has the following functions as spelt out in the Presidential Circular No. 1/2008 of May 2008 on Organization of the Government of the Republic of Kenya:

- Land Policy
- Physical Planning
- Land Transactions
- Survey and Mapping
- Land Adjudication
- Settlement Matters
- Land Registration
- Valuation
- Administration of State and Trust Land
- **Land Information System***

* For the first time an integrated National *Land Information (Management) System (NLIMS)* has been identified as an added core mandate of the Ministry and this is the focus of this Report Paper.

1.2 The Ministry's Structure and Core Functions

The core function of the Ministry is to manage and administer the land resource. The Ministry's functions are critical to the realization of the National Development Goals and Objectives outlined in the Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC), Vision 2030 and the Millennium Development Goals (MDGs); especially poverty reduction, infrastructure and economic growth.

The structure of the Ministry of Lands is organized under the following departments:

- Administration and Planning (*Management and Support Services*)
- Survey
- Physical Planning
- Lands
- Land Adjudication and Settlement

The functions of the Ministry are detailed in the following paragraphs:

1.2.1 Administration and Planning

The Department is responsible for:

- Overall Policy Direction & Co-ordination
- Planning and Management of Resources; Human and Financial
- Legal Advisory Services
- Coordination of Parastatals under the Ministry mandate
- Liaison with International Organizations, Development Partners and other Stakeholders
- Information Communication Technology (ICT) Services

- Land Reform Transformation Unit (LRTU)
- Public Relations
- Cross cutting issues; Management Information Systems, Gender Mainstreaming and HIV /AIDS control.

1.2.2 Survey

The Department offers the following services:

- Surveying and Mapping
- Photogrammetric and Remote Sensing Services
- Map Printing and General Publishing
- Maintenance of Land Registration Maps
- Inspection and re-establishment surveys of National and International Boundaries
- Provision of Hydrographical Survey Services
- Supervision and Maintenance of Quality Control and Assurance on Surveying and Mapping data
- Pre-service and in-service Training Courses at the **Kenya Institute of Surveying and Mapping (KISM)**. This is an Institute of the Department of Survey that offers:
 - Pre-service courses in Land Surveying, Cartography, Photogrammetry and Remote Sensing and Map Reproduction at Diploma and Higher Diploma levels.
 - In-service training for the Ministry and other tailor-made short term courses such as Geographical Information System (GIS), Global Position System (GPS), and Remote Sensing for Mapping and Information Technology (IT).

Under the Ministry's Rationalization Programme, KISM has been proposed for Semi-Autonomous Government Agency (SAGA) status.

1.2.3 Physical Planning

The Department is responsible for:

- Formulation of national, regional and local physical development policies and guidelines
- Preparation of regional and local physical development plans
- Initiate and undertake research in matters concerning physical planning
- Advise Commissioner of Lands and on matters concerning alienation of land under Government Lands Act and Trust lands Act
- Advise the Commissioner of Lands, and Local Authorities on most appropriate use of land including land management (change of user, extension of lease, subdivision and amalgamation)
- Require local authorities to ensure proper execution of physical development controls and preservation orders

1.2.4 Lands

The services offered in this Department include:

- Land Policy Formulation and Implementation
- Management and custody of the land resource records

- Administration of Government and Trust Lands
- Registration of titles and various transactions
- Land valuation for various purposes
- Resolution of land and boundary disputes
- Generation of revenue and collection of A.I.A

1.2.5 Land Adjudication and Settlement

The Department is in charge of:

- Ascertaining land rights and interests under Caps 283 and 284
- Settlement of poor landless Kenyans under the Settlement Fund Trustees
- Management of the Agricultural Settlement Fund
- Administration of group ranches under Cap 287 of the Laws of Kenya.

1.3 Task Force on Automation of the Ministry's Land Records

1.3.1 The Appointment of the Task Force

The Ministry has been in operations for over 100 years and the amount of data generated has since accumulated to unmanageable levels using manual systems. In addition, the demand for land information has increased tremendously over the years. The manual system has therefore hampered service delivery in the Ministry. This has been noted by no lesser office than the Cabinet which, through the Standing Cabinet Committee on e-Government, vide letter Ref: OP/CAB 1/16A dated 11th May 2007 – *see Appendix3b*, directed the Ministry to establish a Task Force to spearhead the Automation Programme of the entire Ministry's Land Records.

In this regard, the Ministry appointed a Ministerial Task Force on Automation of all Ministry's Land Records (MTF_AMLR) vide letter Ref: CON/LS/A/1/1 Vol.IV/57 of 25th May 2007 to address issues of computerisation of all the Ministry's Land Records - *see Appendix2a*.

The Task Force comprises of members from all the technical departments, namely; Survey, Physical Planning, Lands and Land Adjudication & Settlement as well as the ICT unit in the Ministry. The composition of the members of the Task Force is as indicated previously at *page (iii)* above.

1.3.2 The Mandate of the Task Force

(a) Objectives

The Task Force will be required to develop improved systems and process that would enhance service delivery and improve efficiency in line with the reform initiative being undertaken by the Government.

(b) Terms of Reference

The Task Force was mandated to address the following Terms of Reference (TOR) :- (*see Appendix2a*)

1. Examine the current processes and practices and recommend efficient solutions. Emphasize on cutting down on turn round time and resources without compromising the reliability.
2. Identify and take stock of all the relevant land records and data sets for capture and computerization.
3. Carry out an update of the records
4. Determine linkages across the Department
5. Digitize all the land records and data sets identified at “2” above
6. Design and establish a computer based operation system to support and be responsive to all the essential services.
7. Ensure that there is sufficient networking to provide for sharing of the data from within the Ministry both for Headquarters and the field stations.
8. Any other assignment found necessary as we implement the programme.

1.3.3 How the Task Force Operated

The Task Force embarked on the assignment by having its first meeting on 5th June 2007 by defining the scope of work. It subsequently held numerous other, daily and then weekly, technical meetings. Later on, between July-November 2007, the Ministry of Lands was placed under Rapid Results Initiative (RRI), a result Based Management (RBM) tool, by the Public Service Reform and Development Secretariat (PSR & DS), OP and the entire Task Force Team members was reconstituted into an RRI Team on Automation of the Land Records. The team identified and implemented five quick win goals in the Ministry (see Chapter 5 below). After the RRI period, the Task Force Team was, in April 2008 reconstituted as the Technical Working Group on Land Information Management System (LIMS) under the Land Reform Transformation Unit (LRTU) – *see Appendix 3.*

1.3.3.1 Interpretation of the TORs

ToR No. 1: Examine the current processes and practices and recommend efficient solutions. Emphasize on cutting down on turn round time and resources without compromising the reliability.

The Task Force addresses the ToR No. 1 in three parts; one, to consider the situational analysis of the current procedures and practises; two to identify current Challenges and Weaknesses of these procedures; three, to provide solution of re-engineering of the processes. Parts one and two are considered in *Chapter 2 “Current Processes and Practices”* with detailed diagrammatic explanations. The recommended solutions are presented, with others, in Chapter 7 on “Recommendations on Way Forward and Conclusions.”

ToR No. 2: Identify and take stock of all the relevant land records and data sets for capture and computerization; and ToR No. 3: Carry out an update of the record.

The Task Force that ToR Nos. 2 & 3 to be related and hence it addressed the two ToRs together in Chapter 3 titled “*Identification of the Key Land Records for Computerization*”

ToR No. 4: Determine linkages across the Departments.

The ToR No. 4 is presented in *Chapter 4 “Linkages across the Departments”*. Here the Task Force considered the internal and external customer linkages in service delivery by the Ministry. We therefore considered and addressed an additional ToR “*Identify Key Customer Service Points and Services Offered by the Ministry*”

ToR No. 5: Digitize all the land records and data sets identified at “2” above

The ToR No. 5 Having identified and taken stock of all the key land records to be considered for computerization, the Task Force embarked on implementation of some computerization. This chapter presents the 5 RRI Goals, achievements and lessons learned.

ToR No. 6: Design and establish a computer based operation system to support and be responsive to all the essential services.

ToR No. 7: Ensure that there is sufficient networking to provide for sharing of the data from within the Ministry both for Headquarters and the field stations.

The Task Force found these two ToRs related as the ToRs are addressing the solution to all the situational analysis of Ministry presented in detail in the previous chapters 1-5. The Task Force designed some data bases for data capture. It presents recommendation of desired characteristics of a good database design for the Ministry of Lands that a procured technical expertise needs to adhere to.

ToR No. 8: Any other assignment found necessary as we implement the programme.

In July - November 2007 the entire Task Force Team was reconstituted into an RRI Team on Automation of the Land Records. The team identified and successfully implemented five (5) quick win RRI goals in the Ministry (see Chapter 5 below).

After the completion of the RRI period and having registered good results, the Task Force was then transformed into a Working Group on Land Information System (LIMS) under the Land reform Transformation Unit (LRTU) - see Appendix 2b.

The Task Force has summarized and presented its recommendations on the way forward and conclusion in chapter 7 of this Report. We feel that these recommendations should form a basis of current and future computerization projects in the Ministry.

1.3.3.2 Periodical Status Reports

The Task Force made periodical reports on the status of computerization of Ministry’s land records to the Permanent Secretary (PS), Lands as was asked for by the Standing Cabinet Committee on e-Government – see Appendix 3b.

1.3.3.3 NLIMS Project Proposal

In September 2007, the Task Force made and presented a PROJECT PROPOSAL titled “Development and Implementation of an Automated National Land Information Management System (NLIMS)” to both the Director of e_Government, Office of the President (OP) and the Chief Executive Officer (CEO) of the Information Communication Technology (ICT Board) for consideration for funding by the World Bank under the Kenya Communication Transparency Project (KCTP) – *see Appendix 7.*

1.3.3.4 The Task Force as an RRI Team on Automation

The team identified and successfully implemented the following five (5) quick win RRI goals in the Ministry (see Chapter 5 for results) as follows) :-

- RRI No. 1 – Reconstruction of GLA Volumes/Land Records.
- RRI No. 2 – Creation of a Property Valuation Database System.
- RRI No. 3 – Document Management System (DMS) for *All* Approved Physical Development Plans in the Country.
- RRI No. 4 – Document Management System (DMS) for All Authenticated Cadastral Survey Plans in the Country.
- RRI No. 5 – File Tracking System for All Settlement Plot Files at the Ministry Headquarters.

This was the first time for ALL the 5 RRIs initiatives to be carried out at the Ministry of Lands!! For the summary of the results, – see Appendix 9.

1.3.3.5 The Task Force under the Land Reform Transformation Unit (LRTU)

The Task Force was later incorporated into the Land Reform Transformation Unit (LRTU) as the Ministerial Technical Working Group on Land Information Management System (LIMS) vide letter Ref. No. CON/L/A/29/VOL.X/ of 4th April, 2008 - *see Appendix 2b* - to coordinate and ensure that the computerization initiatives in all the departments of the Ministry are expanded and up scaled in an integrated manner.

The Task Force, together with Sida Consultant Team (of Macleran & Mwathane) has developed a LIMS Implementation Programme under LRTU for Next 2 Years – *see Summary Report in Appendix 13.*

1.3.3.6 Kenya National Dialogue and Reconciliation:

Agenda Item 4: Long-Term Issues and Solutions Matrix of Implementation Agenda

The issue on the computerization and automation of the Ministry’s Land Records, being addressed and presented here in this Report Paper by the Ministerial Task Force, is also being considered as a Land Reform issue, under the Kenya National Dialogue and Reconciliation – Agenda Item 4 – which calls for the “*Establishment of a transparent, decentralized, affordable and efficient GIS-based Land Information Management System and a GIS-based Land Registry at the Ministry of Lands including all local authorities*” – *see Appendix 4.*

2 Chapter 2 The Current Processes and Practices

This Chapter examines the Current Processes and Practices in each of the four technical departments of the Ministry. It also presents strengths and weaknesses in these processes. However, re-engineering of these processes is presented later in Chapter 7 on recommendations on the way forward.

2.1 Department of Lands

Introduction

The department was founded in 1903 to operate the Crown Lands Ordinance 1902 as subsequently amended. Currently it consists of three Divisions namely; Land Administration, Valuation and Land Registration.

2.1.1 Land Administration Division

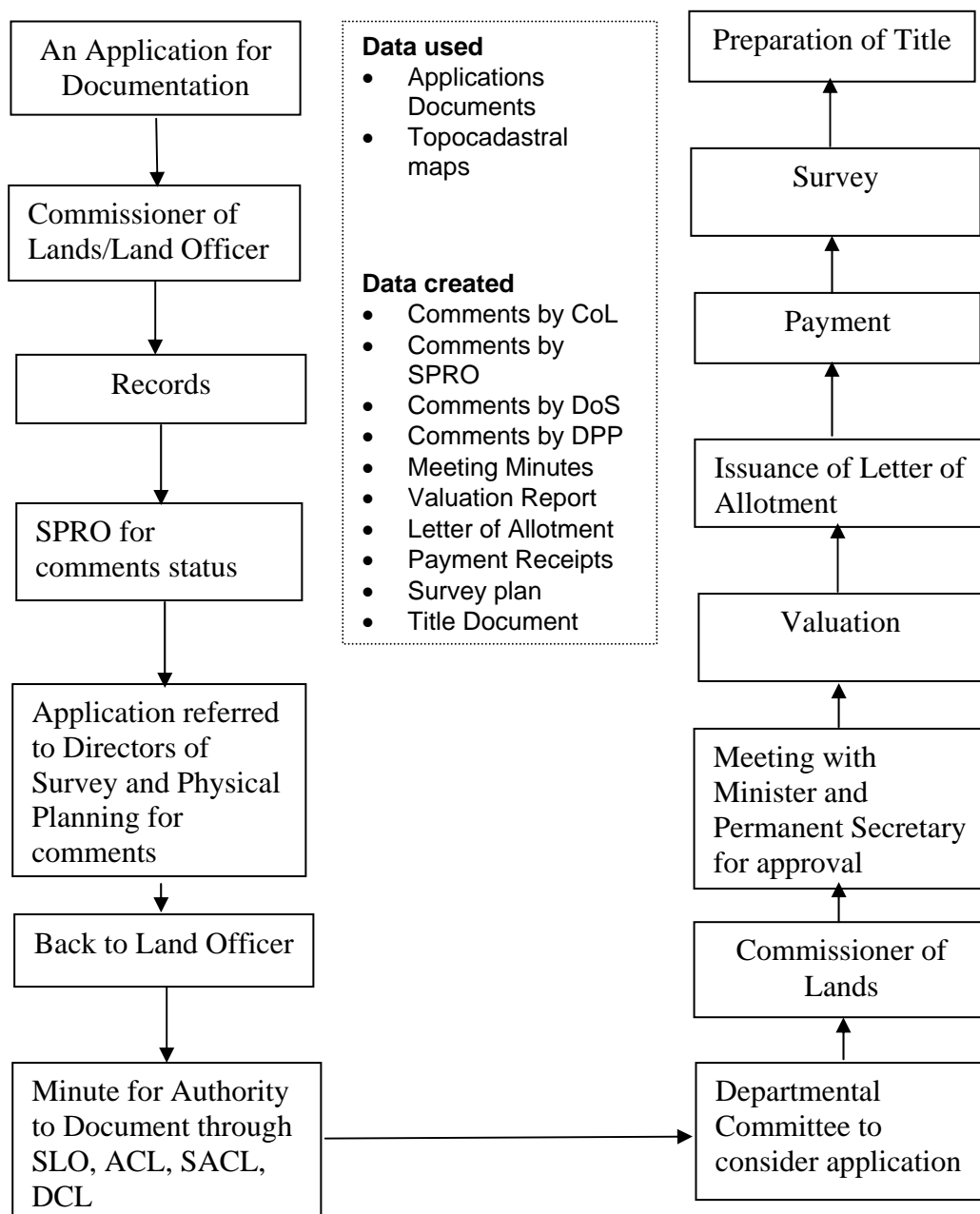
It is responsible for the administration of all Government Land and the Trust Land on behalf of the County Councils.

2.1.3.1 Current Processes and Practices

- i). Alienation of Government and Trust Land for institutional purposes and regularization of allocations by local authorities.
- ii). Title preparation for Government and Trust Land under the Registration of Titles Act Cap. 281 and the Registered Land Act Cap. 300.
- iii). Issuance of land rent clearance certificate and consents
- iv). Processing of development applications (change of user, extension of user and extension of lease)
- v). Processing of Sub-division Schemes;
 - a. Private land within urban areas.
Applications received through the local authorities or recommendations for approval forwarded to the Commissioner of Lands by Local authorities
 - b. Processing of subdivision of Agricultural Land
- vi). Processing applications for setting apart of Trust Land
- vii). Approval of building plans

- viii). Establishment and oversee operation of the Land Control Boards
- ix). Preservation of land for public use as well as preservation of fragile ecosystems.
- x). Plans Records Office – Checking of status, noting allocations, plotting of maps/plans, preparing forms for setting apart, etc.
- xi). Preparation of Titles/Documents for institutions
- xii). Processing of Court cases and Parliamentary Questions

Diagram 2.1(1): Current Processes and Practices in Land Administration



a) Alienation of Trustland for Regularization or Institutional Purposes

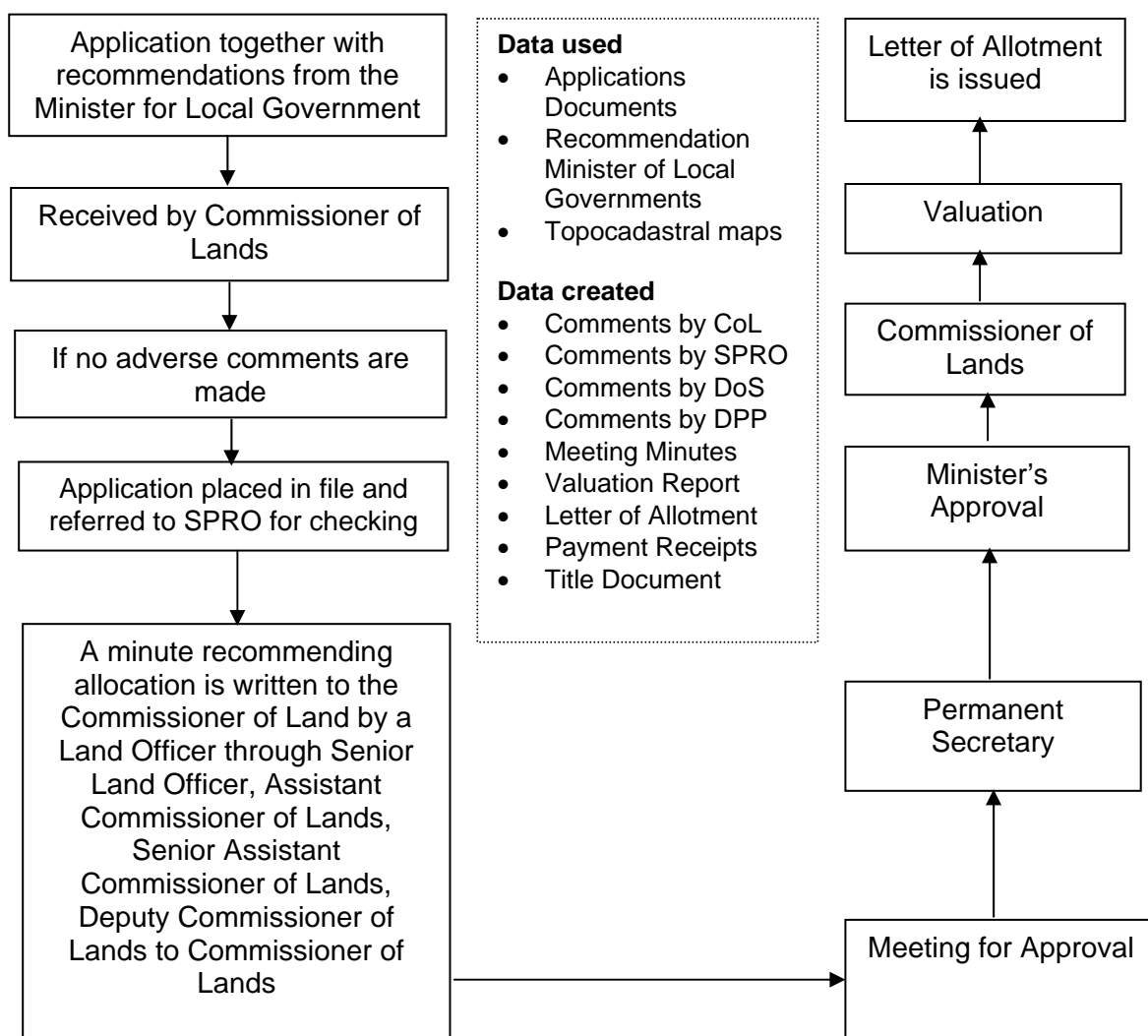
An application is forwarded to the respective County Council. The Application is considered in a full council meeting and minutes taken before being forwarded to the Minister for Local Government.

The application together with recommendations from the Minister for Local Government is received by the Commissioner of Lands.

The application is subjected to verification by SPRO and if no adverse comments are given on the parcel of land, the Commissioner of Lands recommends the allocation for approval by the Minister for Lands through the Permanent Secretary.

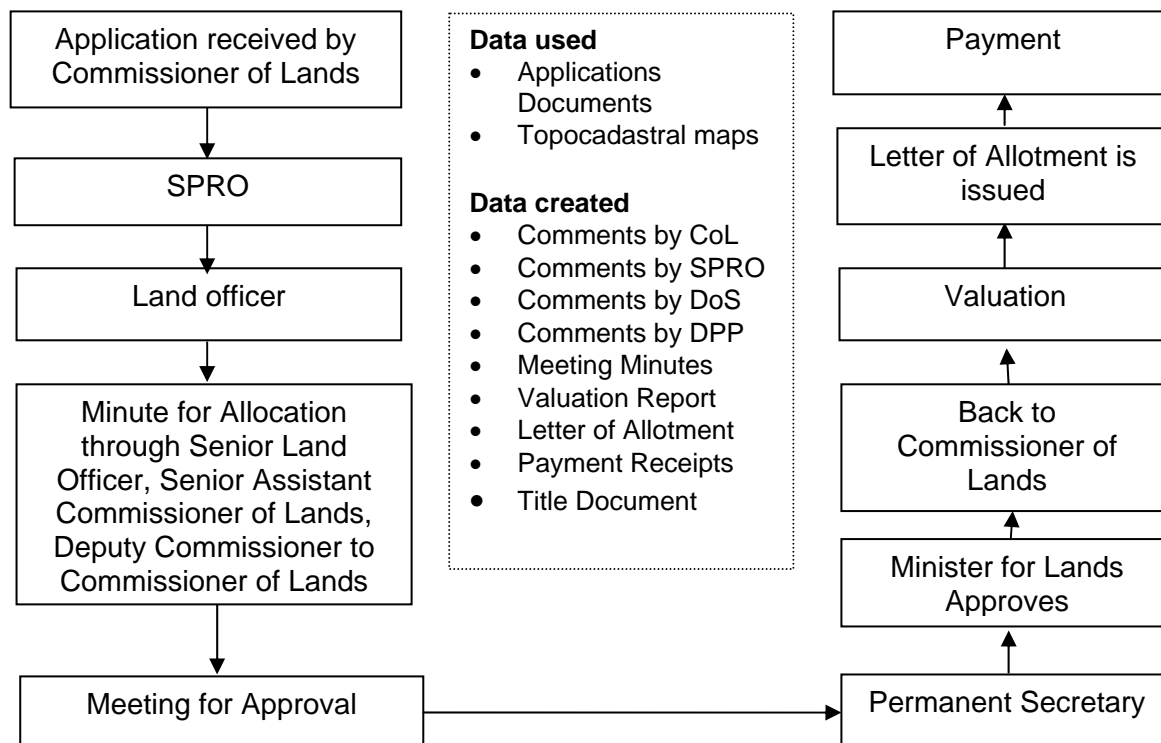
A letter of allotment is issued and the allottee asked to pay the money assessed as stand premium, annual rent, conveyancing fees, registration fees, Stamp Duty, approval fees and planning fees. Once the allottee pays and has the parcel of land surveyed a title is prepared. (See process of Title preparation).

Diagram 2.1(2): Flow of Activities in Alienation of Trustland



b) Alienation of Government Land for Institutional Purposes

Diagram 2.1(3): Flow of Activities in Alienation of Government Land



c) Processing applications for extension of lease, change of user, extension of user

- Receiving application and or recommendation from the applicant or local authority.
- Circulation for comments from Director of Surveys, Physical Planning, Town Clerk.
- Once comments/recommendations are received, a minute is written by a Land Officer recommending the proposal for approval by the Minister for Lands through the Commissioner of Lands.
- A committee comprising of Senior Land Officers under the chairmanship of the Senior Assistant Commissioner of Lands meets and considers the applications. They may recommend or reject applications. The recommended applications are then forwarded to the Commissioner of Lands for recommendation/approval before they are passed to the Permanent Secretary who forwards them for the Minister's approval. Upon approval by the Minister for Lands, the decision is communicated through a letter by Commissioner of Lands.

- Valuation for enhanced rent is done and the applicant asked to comply with certain conditions.

Preparation of Title of endorsement is done upon payment of some fees (see attached schedule for title preparation process).

d) Building Plans Approval

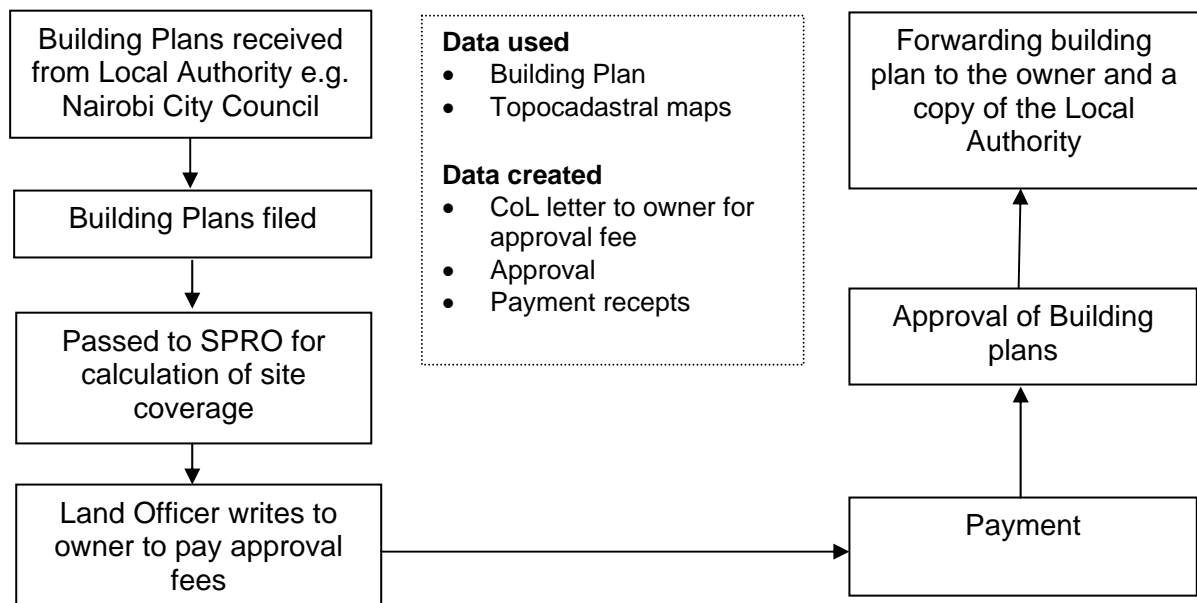
An application is received from the concerned Institution together with a plan showing the portion of land being applied for.

The application is received and passed to Senior Plan Records Officer) SPRO for verification of the status.

The application is minuted to Commissioner of Lands for approval. Upon approval the Institution is issued with a letter of allotment with conditions specifying the user of the plot and the fees payable.

A file is opened and the allottee pays.

Diagram 2.1(4): Flow of Activities in Building Plans Approval



2.1.2 Valuation Division

The division is responsible for valuation of land and landed properties for various purposes. Common types of valuations carried out in the division are:-

- (i) Valuation for Stamp Duty
- (ii) Valuation for subdivision (rent apportionment)
- (iii) Valuation for Lease extension, change of user and extension of user
- (iv) Valuation for Rating
- (v) Valuation for alienation
- (vi) Valuation for Government Purchase, Sale and Leasing
- (vii) Valuation for purchase of freehold interest
- (viii) Valuation for compulsory acquisition
- (ix) Valuation for estate duty/public trustee administration

2.1.3.1 Current Processes and Practices

The Processes have a common procedure which is as follows

a) Instructions

Instructions are received in a valuation requisition form which is filled in the correspondence file. Instructions for stamp duty are received from the Collector of Stamp Duty while instructions for rent apportionment, lease extension, change of user and alienation are received from a Land Officer.

Valuation for Rating and Government Purchase/Sale/Leasing are received from other Ministries and Departments.

b) Allocation by Chief Valuer

The correspondence file is received at the Chief Valuation Officer's (C.V.O's) office. The Chief Valuer assigns the file to the action officer.

c) Registry

From the C.V.O. the file is forwarded to the Registry. Here a register is maintained where all the files allocated to valuers and the corresponding dates are indicated.

d) Valuation

The Registry staff forwards the file to the action officer. The valuer gets the necessary Plans/Maps, searches and arranges for field inspection. The valuer collects market data and then prepares the valuation report and the same discussed with the supervisor who countersigns the valuation.

The valuer then indicates on the requisition form the value or rent returned and signs the form.

e) Data Entry at Registry

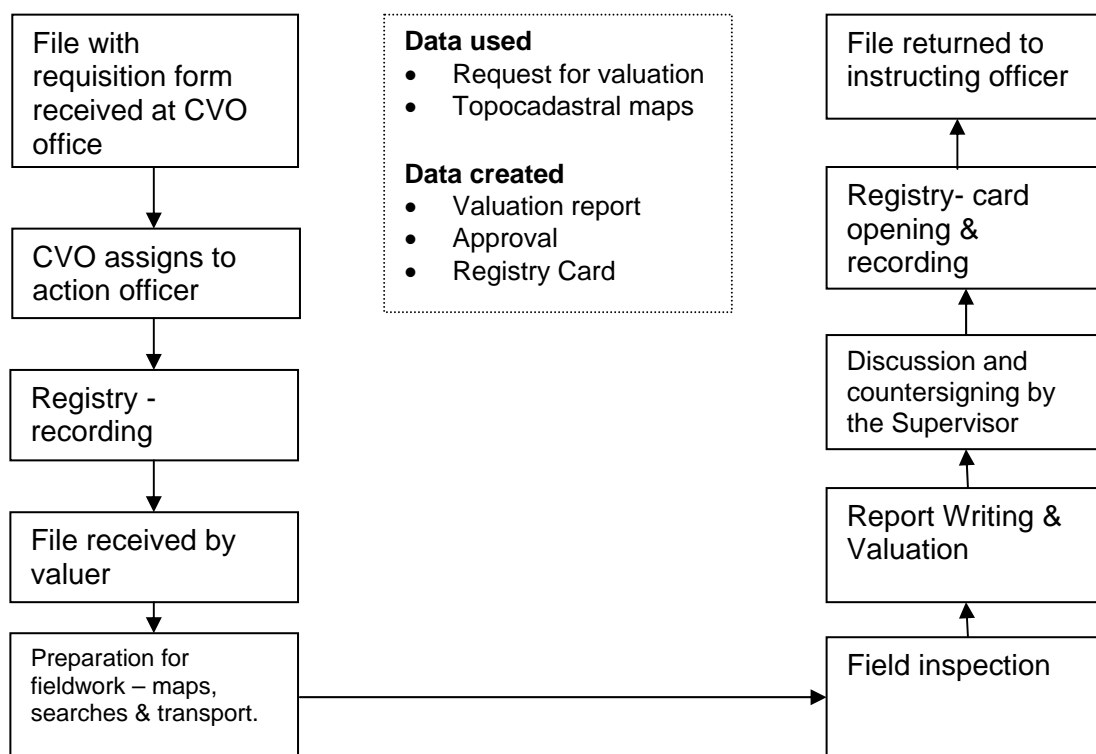
The file is forwarded back to the Registry for recording and filing. The following is done at the Registry at this stage:-

- i. Record in the Movement Register
- ii. Opening or updating of Cards: This Card indicates the following:-
(File Number, L.R. No., Area, Date of Valuation, Transferee, Transferor, Valuation Reference (V.O.S. No.), Value/Rent)
- iii. Filing the Valuation Report
This is done in Box files which are classified into different zones (adopted from local authorities) depending on the locality of the property. The valuation report is given a reference number which is also indicated in the Card and in the requisition form for ease of reference.

f) Dispatch

File is dispatched to the instructing officer (collector of stamp duty or Land Officer) for further action.

Diagram 2.1(5): Flow of Activities in Valuation procedure



2.1.3 Land Registration Division

The division is responsible for all registration of titles in Kenya.

2.1.4.1 Current Processes and Practices

a) Stamping of Documents

- i. Documents are presented for assessment of stamp duty at the banking hall.
- ii. The Assessor of stamp duty confirms whether duty is payable and then issues a Kenya Revenue Authority (KRA) stamp duty assessment form to be completed and duly returned to the Assessor for purposes of assessment of duty.
- iii. After counterchecking the information on the document and on the assessment form the Assessor proceeds to assess stamp duty payable and appends his/her signature to the form thereby advising the applicant to proceed to pay the assessed duty at the Bank.
- iv. After payment, the presenter brings back the document and the form which has been duly stamped by the bank that payment was actually done.
- v. The returns from KRA are brought to the stamping section after 2 days and it is only then that Stamping can be franked or embossed on the document.
- vi. After the documents are stamped they are forwarded to the Accountant to countercheck payments and then forwarded to the Auditors for audit purposes.
- vii. The documents are then ready for dispatch.

CHALLENGES

1. The embossing machine is archaic and ancient dating back to 1958 which is physically handled and constantly breaks down. The process of repair by the Government printer is bureaucratic and takes too long.
2. Payments are done outside the building and the communication for confirmation of payment takes 2 days.

b) Registration

The Central Registry registers titles and documents under the Registration of Titles Act (Cap 281), the Government Lands Act (Cap 280) and the Registration of Documents Act (Cap 285) and the Nairobi District Registry handles documents registered under the Registration of Lands Act (Cap 300).

The process of Registration starts with collection of Stamp duty and other prescribed fees. Once the document is booked, it becomes an accountable instrument. After booking a document, deed files are matched, investigations done and then entered in the "A" Book. The Registrar of Titles signs the document and eventually it is copied and dispatched.

A document follows the procedure described here below for its registration.

i. Booking Counter

The counter is the main window where documents are first presented and this is also the enquiries counter where members of the public are served. Documents are received and booked in this counter.

The Applicant completes the Application for Registration forms in quadruplicate and makes the requisite fees by way of affixing revenue stamps on the original form. The documents, together with the forms are stamped with a date stamp indicating the date, the month, the year and the exact time when received. This becomes the legal date of registration.

A **Day Book** number is given and indicated on both the documents and the forms and it is useful for a later follow-up in case there is a query on the document. One copy of the form is then given back to the presenter.

The documents once booked are kept in the strong room up to the following day when they are worked on to give time for any other opposing document e.g. an encumbrance that may precede or follow a document.

Applications for official search are also presented at the booking counter.

ii. Strong -Room

The next day, the documents are taken to the auditor who checks them to ensure that payments in terms of stamp duty and the land rent have been paid, after which they are returned to the strong-room.

The strong-room officer assigned the duty of matching documents then retrieves all the relevant deed files relating to the booked documents and matches them together. He also completes his morning list indicating the Deed files which have been retrieved from the strong-room and against what day book numbers. The morning list is important in helping trace deed files.

The auditing and matching of documents in the strong-room takes about four hours. Documents are then forwarded to the Registry Superintendent (R/S)

iii. Registry

Once the R/S receives the documents in the Registry, he marks them to the investigation officers and completes the movement register to show who is allocated what documents. This is called the "A" Book. This takes about one hour. Refer to Sec 26 of R.T.A.

iv. Investigation

The investigation Officers check and examine whether the documents are properly drawn and whether there are any encumbrances that can prevent their registration. They also ensure that all the necessary files/documents from the strongroom are attached or matched with the documents to be registered. Once they examine the suitability of the documents, they make recommendations with reasons whether they should be registered or rejected.

If they recommend for rejection, a given document will be forwarded to the Registrar of Titles to countercheck and verify the information and countersign for its rejection. The rejected document will follow these procedures backwards to the dispatching counter.

If an Investigation Officer finds the document in order and it is recommended by the Registrar of Titles for registration, it is brought back to the Registry Superintendent who in turn marks it to the entry officers. This process takes about one day except in cases of sub-division.

Where there is sub-division, the investigating officers refer the Deed plans to the Department of Surveys for confirmation and also to the Valuation Section for rent apportionment as the case may be. They also draft certificates of Titles of the new sub-plots for typing. They also complete the "A" Book and indicate when the document is passed to the next stage.

v. Making of Entries

At this stage, the Registration Officer enters the transaction(s) on the documents and also on both the land office copy of the Title and on the Original Title unless the document is an encumbrance which is then entered on the Registry Copy of the Title only and they indicate the time and date of registration.

These officers also draft memorandums and valuation forms in case of transfers, complete the portion books where there are sub-divisions. They also complete the "A" Book indicating when they have finalized with a document. The Registration officers then pass the documents to the R/S who in turn marks them to the Registrar of Titles.

At this stage the Registrar of Titles will countercheck the entries made by the entry officers and the legality of the documents and if found in order the documents are signed. The Registrar will pass the signed documents to the R/S who in turn completes the "A" Book. The document is deemed registered when the Registrar of Titles signs the same. This takes about one day.

vi. Photocopying, Sealing and Dispatch

Once registered, the documents are passed to The R/S who then makes arrangements to have the original document photocopied and all the documents sealed by the dispatching officer. Copies of the original documents are put in the relevant deed files and the other documents are sent to the booking counter where the presenter collects the documents.

CHALLENGES.

1. Documents are booked manually which is tedious, tiresome and time consuming.
2. Documents are physically inspected by the internal auditors in their offices which is time consuming.
3. The documents are manually matched with the Deed files which are also retrieved manually.
4. The Deed files are not always available due to misfiling.
5. The documents are manually entered into the control book and manually allocated to the investigation officers.
6. The entries and registration are done manually and this is time consuming.
7. The documents have to be photocopied after registration and more often than not, the machines cannot cope.
8. The G.L.A. volumes and Kalamazoo binders are torn and are in tatters, making registration impossible, necessitating reconstruction which is time consuming and prone to forgeries, and/or incorrect entries.
9. The manual records are prone to forgeries because we do not have a back-up.

Diagram 2.1(6): Flow of Activities in Stamping of Titles and Other Documents

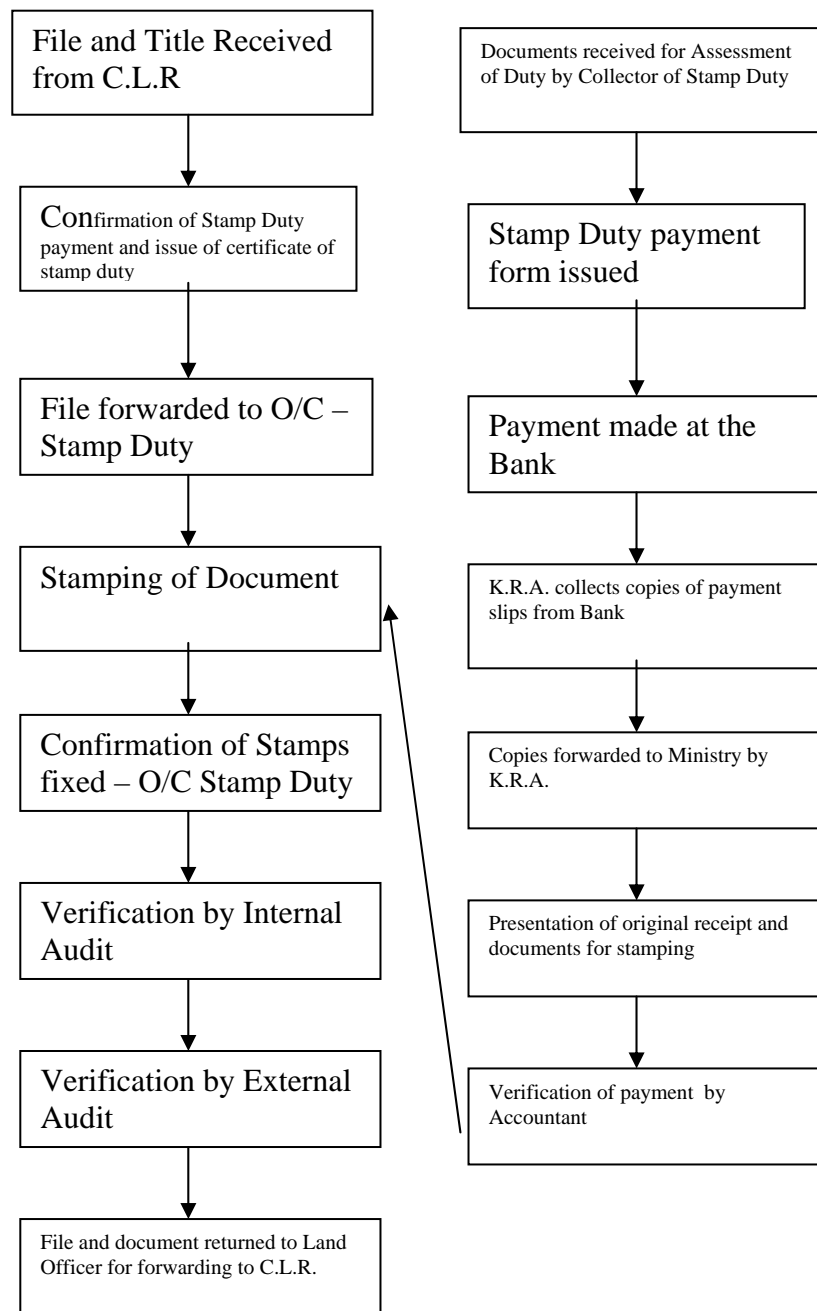
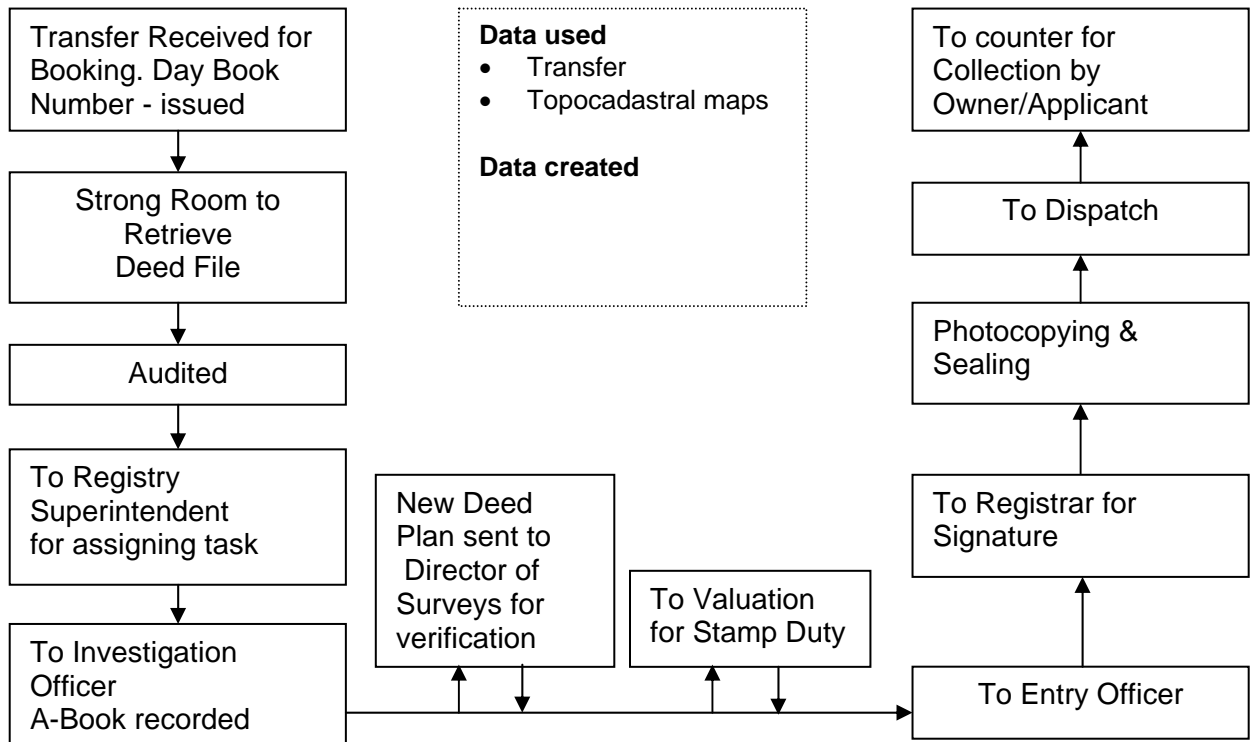


Diagram 2.1(6): Flow of Activities in the Central Registry



2.2 Department of Surveys

Introduction

The Department of Surveys started way back in 1903 with its initial function being undertaking of Title surveys along the railway line. It has since developed from its initial function to embrace mapping and related functions.

Currently the Department comprises of six divisions namely; Cadastral, Adjudication, Geodetic & GIS, Mapping, Hydrographic Surveys and Administration. The Department has a training institute, Kenya Institute of Surveying and Mapping (KISM).

The focus of this paper is land records and hence discussions will focus on four of the technical divisions, namely Cadastral, Land Adjudication, Mapping and Geodetic & GIS. The Hydrographical Division is barely two year old and hence not fully established.

2.2.1 Cadastral Division

2.2.5.1 Current Processes and Practises

a) Fixed Boundary Procedure

i). Field Survey:

Field surveys are executed by either Government Surveyors or Private Surveyors once the necessary approvals and authority to survey have been obtained from relevant authorities. On completion of the survey the surveyor prepares a survey report, which he submits to the Director of Survey.

ii). Registration:

The survey job is received by the Director of Surveys at the Registry after which it is forwarded to the registration section. During registration;

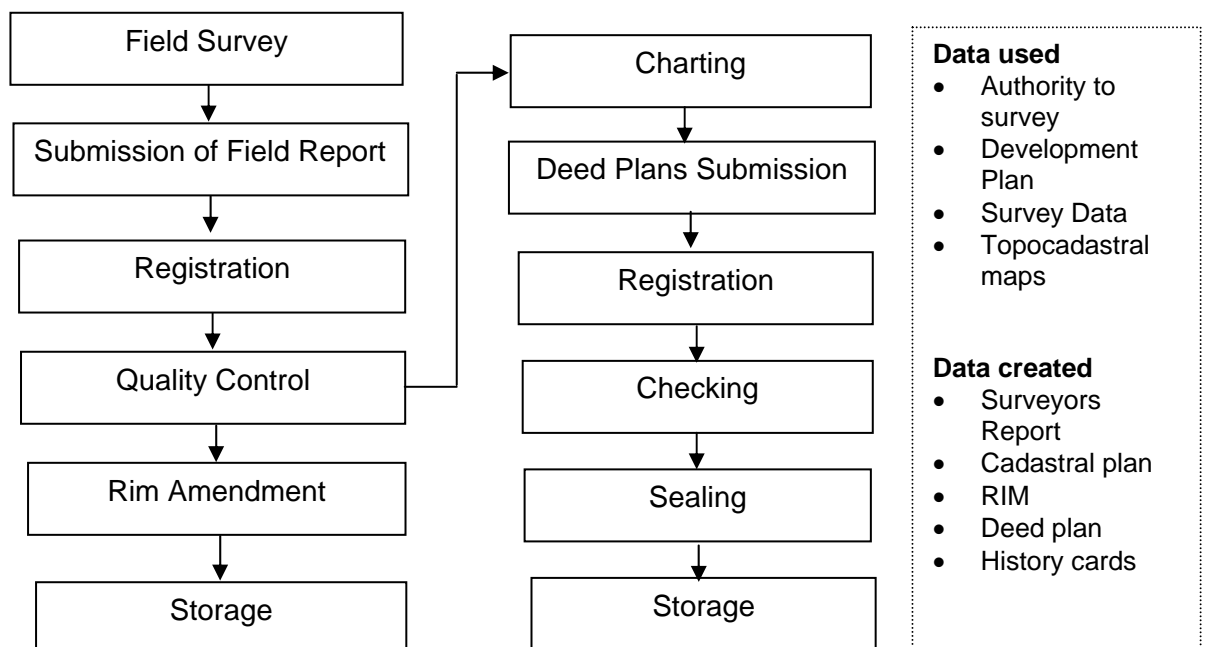
- Numbering of Survey plans and computation files is done including issuance of plot numbers and cross referencing of old and new plans.
- Authorities and land allocation documents by Commissioner of Lands and Director of Physical Planning are verified
- Quoting of authorities on Survey Plans is checked

iii). Quality Control: After registration the survey job is forwarded to the checking unit (preliminary and final checking), for purposes of quality control. At this stage approvals and authorities are scrutinised and the general execution of the whole survey work checked

iv). Authentication: Checked survey jobs are then forwarded for authentication if approved or return to surveyor if not approved. If approved the surveyor is notified so that he can follow up the preparation of deed plans under RTA or amendment of RIM under RLA.

- v). **Charting:** Authenticated survey jobs which are under RTA are forwarded to the charting section for charting.
- vi). **Deed Plans:** After receiving the authentication note, under RTA, the surveyors prepares deed plans for the concerned parcels and submits to the director of surveys. The deed plans are checked, signed and sealed, ready for forwarding to the commissioner of lands to facilitate preparation of Titles.
- vii). **RIM amendment:** After receiving the authentication note, under RLA, the surveyor initiates RIM amendment which is then sealed and prints made for forwarding to the commissioner of lands to facilitate preparation of Titles.
- viii). **Storage:** On completion of the cadastral job processing, related documents are taken to Survey records Office for storage

Diagram 2.2(1): Flow of Activities in Fixed Boundary Surveys

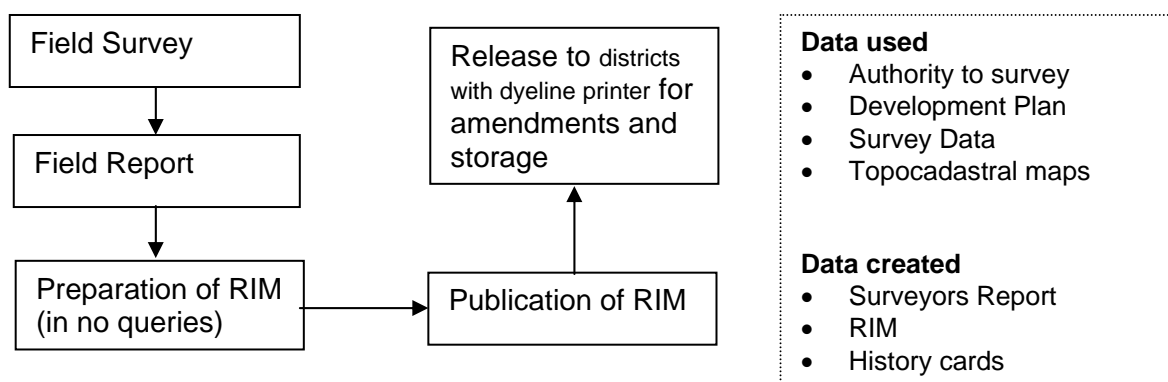


b) Semi-Fixed Boundary Procedure

Also undertaken under the Cadastral Division is the survey of large farms (company and cooperative schemes as well as settlement schemes). In this kind of survey the perimeter boundary of the area of interest is fixed but the survey of parcel boundaries is relaxed resulting to general boundaries.

After filed survey, the survey report is submitted to company and cooperative section where Registry Index maps are prepared, published and released to district offices for handling of further transactions within the area.

Diagram 2.2(2): Flow of Activities in Semi-Fixed Boundary Surveys



2.2.2 Adjudication Division

2.2.3.1 Current Processes and Practises

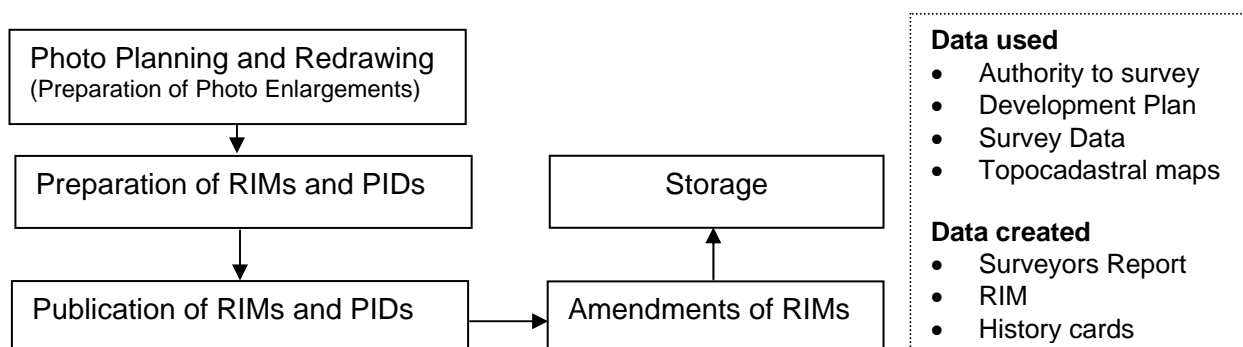
a. Adjudication Surveys Procedure

Adjudication surveys are what is widely known as general surveys, they were introduced in Kenya over 40 years ago to speed up the process of land registration. The process relies mainly on aerial photography, which is taken after land owners have been told to plant edges along there property boundaries.

- i). **Photo Planning and Redrawing (preparation of photo enlargements)**
Once an adjudication area has been declared, photo enlargements for the area are prepared on request by the department of Land Adjudication and Settlement. The enlargements are used by the department to carry out the adjudication process after which they are returned to the Director of Surveys.
- ii). **Preparation of RIMs and PIDs**
On receiving back the enlargements and if they is are no queries the Director of surveys prepares the Registry Index Maps, if rectified aerial photography is used and Preliminary Index Diagrams if un-rectified aerial photography is used
- iii). **Publication of RIMs and PIDs**
On completion of the RIM/PID preparation the maps are published and copies of the 1st editions forwarded to the department of Land Adjudication and Settlement together with their corresponding area list.
- iv). **Amendments of RIMs**
After Land registration, any subsequent transactions on the land parcels i.e. subdivisions, are reflected on the RIM/PID through the amendment process. This results into new editions of the RIM/PID

- v). **Storage**
Storage of RIMs/PIDs and amendments are undertaken at District stations.

Diagram 2.2(3): Flow of Activities in Adjudication Surveys



2.2.3 Geodetic and GIS Division

2.2.4.1 Current Processes and Practises

a) Provision of Geodetic Controls

Provision of Geodetic Network, both horizontal and vertical is the responsibility of the National Mapping Agency.

In provision of controls, a reconnaissance survey is carried out to determine suitable locations of the controls

Once the reconnaissance is completed, monumentation of the points is carried out in accordance the class of the control point

The monuments are allowed time to set after which observations are undertaken using precision GPS equipment for horizontal controls and precise levels for vertical controls

Post processing is then done including corrections and adjustments to determine the final coordinates for adoption

b) Maintenance of National and International Boundaries

It is the duty of the Mapping Agency to maintain both national and international boundaries. It does so by holding stakeholder meetings, ensuring visibility of the boundary marks and marking or establishing whichever is missing

c) Calibration of Equipment

The Director of Surveys has the responsibility to ensure all equipment used for survey work in the country are calibrated

d) Photogrammetric Procedure

i. Photo Planning

Before aerial photography is undertaken, a most important stage is that of planning. This includes; identification of the area of interest, the number of runs and their direction, the best season to fly and remarking

ii. Pre-marking

This is the process of making ground marks on the area to be covered by aerial photography. The marks are later used to undertake aerial triangulation.

iii. Aerial Photography

The actual exercise of taking photographs

iv. Triangulation

A technical process of correcting distortions on the photographs

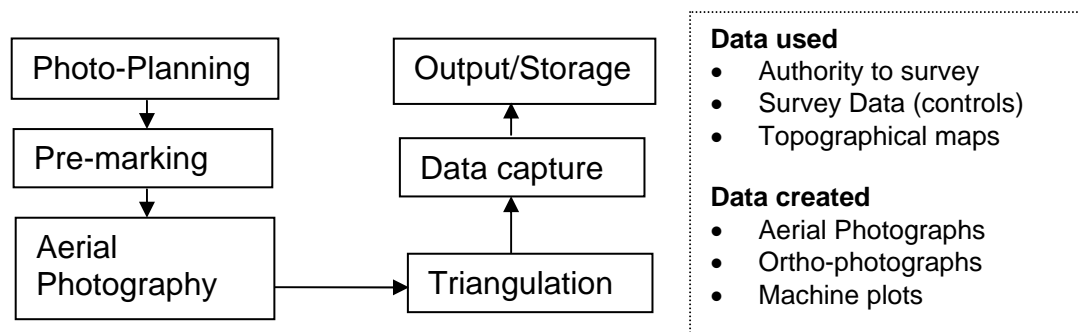
v. Data capture

Extracting data from the aerial photographs

vi. Output/Storage

Presentation of the acquired data and storage of the same

Diagram 2.2(4): Flow of Activities in Photogrammetry

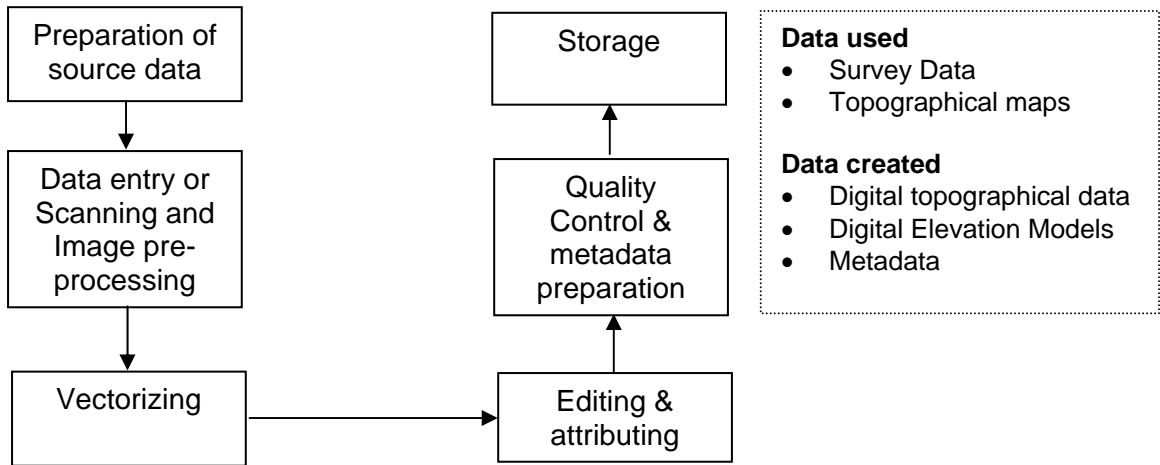


e) GIS Procedure

The GIS unit has the responsibility of conversion of analogy data to digital format and required GIS standards. The process includes;

- i). Preparation of the source data
- ii). Data entry or Scanning and Image pre-processing
- iii). Vectorizing
- iv). Editing & attributing
- v). Quality Control and metadata preparation
- vi). Storage

Diagram 2.2(5): Flow of Activities in GIS



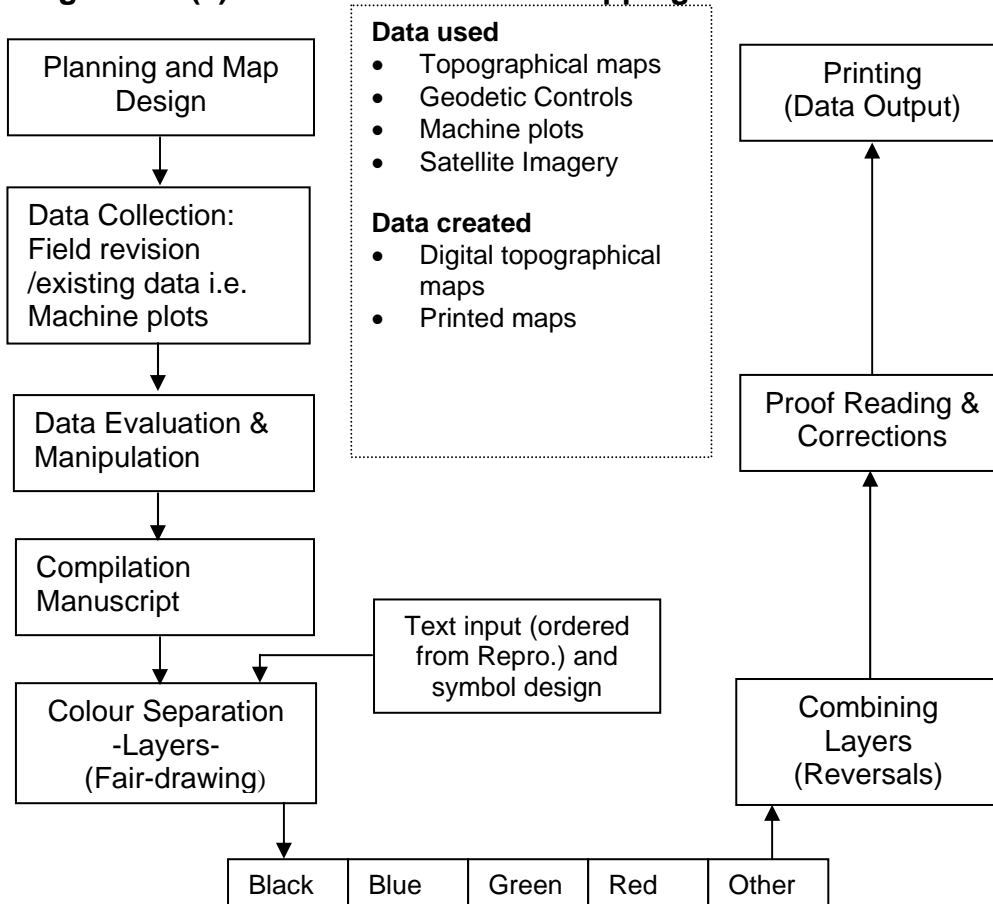
2.2.4 Mapping GIS Division

2.2.5.1 Current Processes and Practises

a) Map Production Procedure

- i). Planning and Map Design
- ii). Data Collection
- iii). Field Revision
- iv). Data Evaluation & Manipulation
- v). Compilation Manuscript
- vi). Symbol Design
- vii). Text input
- viii). Colour Separation
- ix). Combining Layers (Reversals)
- x). Proof Reading & Corrections
- xi). Printing (Data Output)

Diagram 2.2(6): Flow of Activities in Mapping



2.3 Department of Physical Planning

2.4.1 Introduction

Physical planning has a long history in the country dating back as far back as 1902 when the Crown Lands Ordinance was enacted. Currently it operates under the Physical Planning Act Cap 286 of 1996.

The department is the planning authority in Kenya and is mandated to oversee all planning activities in the country. The Director of Physical Planning is the Chief Government adviser on all matters relating to physical planning.

2.4.2 Current Processes and Practices

Physical planning is achieved through, among others, the following functions:

1. Preparation of various physical development plans, namely:

- Regional Physical development plans
- Local Physical Development Plans

2. Recommending on development applications, namely:

- Change of use e.g from residential to commercial
- Extension of use e.g from single to multi-family dwelling houses
- Extension of lease
- Subdivision and amalgamation

3. Dispute resolution through the various Physical Planning Liaison Committees:–

- Municipal/District Physical Planning Liaison Committee
- Nairobi Physical Planning Liaison Committee and
- The National Physical Planning Liaison Committee.

In all these Committees with the exception of Nairobi, the Director or the District Physical Planning Officer is the Secretary.

2.3.2.1 Procedure for plan preparation

- i). Intention to prepare the development plan
- ii). Data collection from Imagery/topographical information, background information. The critical sources are Survey of Kenya, Regional Centre for Mapping for Resource and Development ,ground picking/surveys
- iii). Data collection from line Ministries and Departments,(economic data, social data etc)
- iv). Base map preparation
- v). Stakeholder meetings for consensus building
- vi). Draft Plan
- vii). Notice of completion of the Plan and circulation (calling for comments, objections within a period of sixty days).In Kenya Gazette and two local dailies
- viii). Amendments
- ix). Vetting for approval
- x). Submission to Minister for Approval
- xi). Notice of Approval (in Kenya Gazette)
- xii). Assigning Plan approval number
- xiii). Circulation to Commissioner of Lands
- xiv). Recording in Plan records register
- xv). Storage

Diagram 2.3(1): Flow of Activities Physical Planning

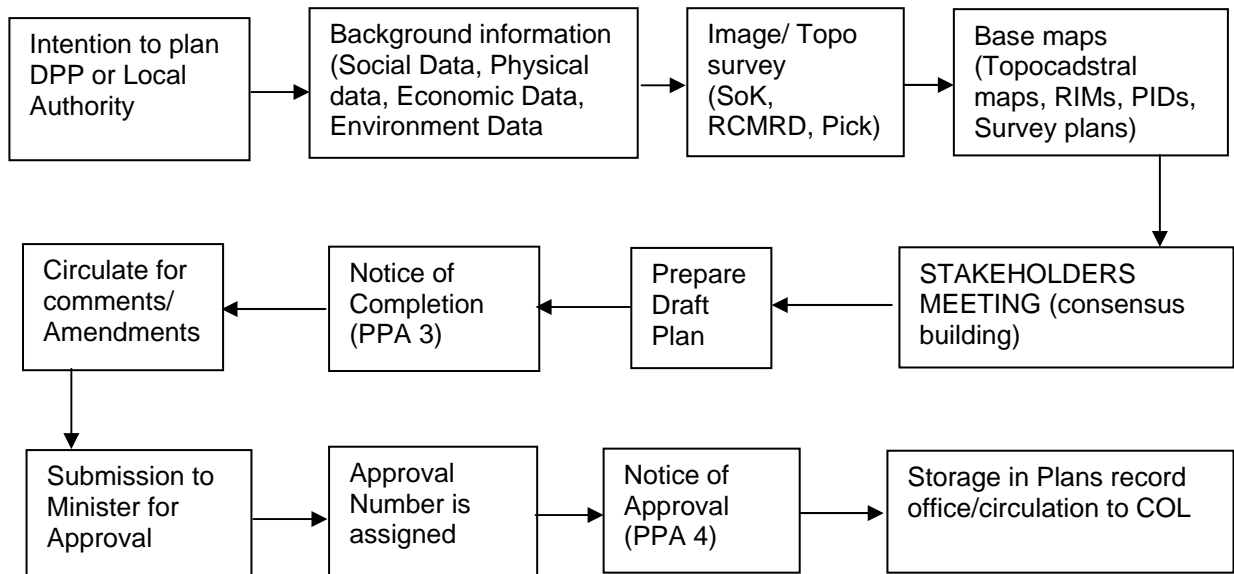
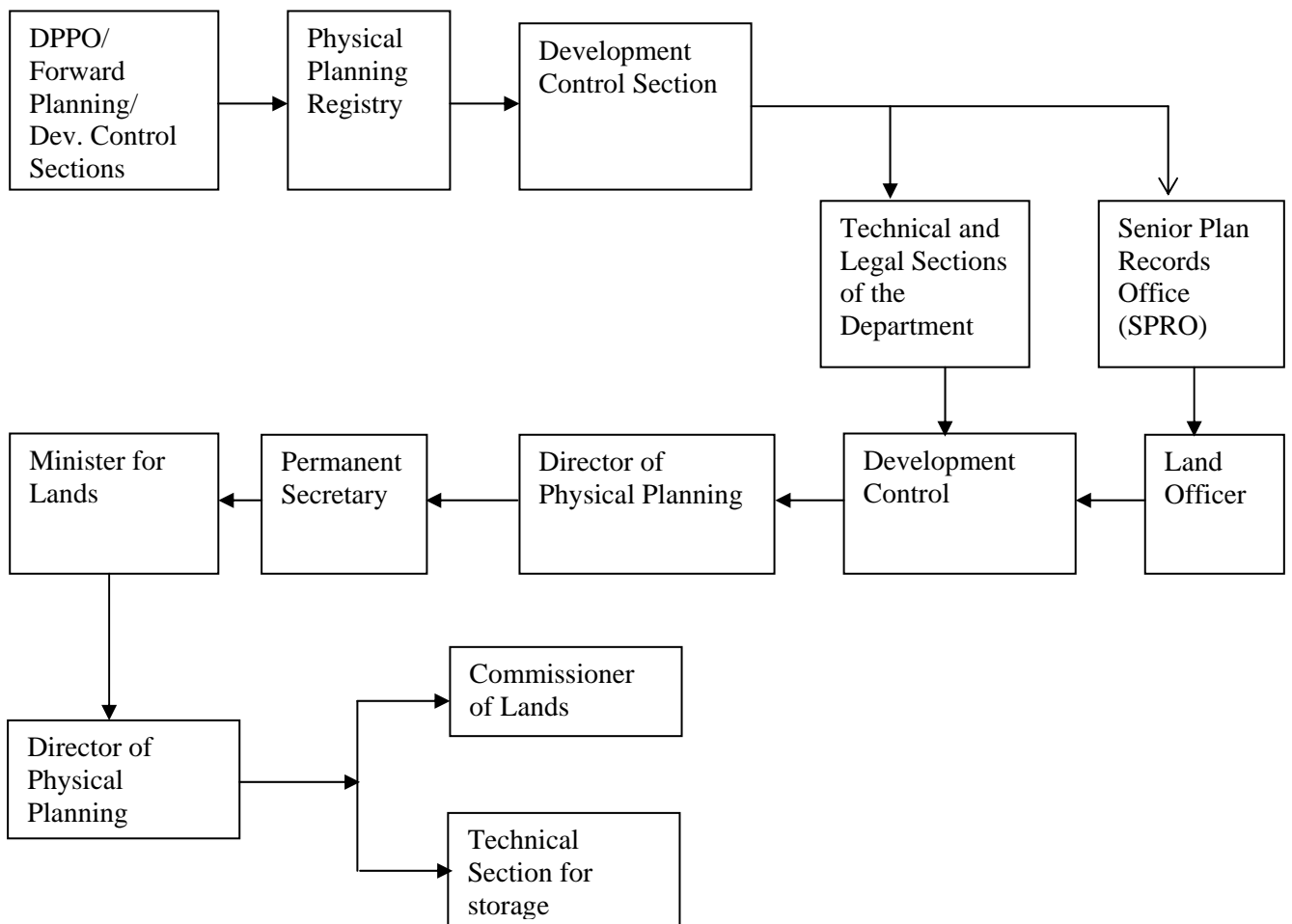


Diagram 2.3(2): Procedure for approval of development plans (Vetting and Plan Approval Process)



2.4 Department of Land Adjudication and Settlement

Introduction

Land Adjudication commenced in 1959 with the enactment of the Land Consolidation Act Cap.283 and Land Adjudication Act Cap. 284 of 1968. Settlement programmes which operate under Agricultural Act Cap 318 started in 1961

The Department is charged with the responsibility of ascertaining land rights and interests, land consolidation and Adjudication, settlement of the poor landless Kenyans and management of group ranches

Currently the department comprises of two divisions namely Land Adjudication Division and Settlement Division.

2.4.1 Settlement Processes

a) Acquisition of suitable agricultural land

Land for settlement is acquired from either private proprietors or the Government

Privately-Owned Land

- i. Carrying out a search of the Title (*Land Registration Division*)
- ii. Valuation of the property (*Valuation Division*)
- iii. Ministerial Tender Committee negotiates and deals with purchase issues after the officer administering the fund (P.S) is consulted (*Administration and Planning*)
- iv. Purchase of property (*Settlement Fund Trustees*)

Government Land

- i. Reservation of Government land for settlement purposes (*Commissioner of Lands*)
- ii. Transfer of land to Settlement Fund Trustees (*Lands, Administration and Land Registry*)

b) Planning, Demarcation and Survey

- i. Physical planning of settlement plots, public utility plots, access roads, etc (*Settlement, Physical Planning and Survey Departments*)
- ii. Demarcation and survey of plots (*Settlement and Survey Departments*)
- iii. Final survey for title-mapping – (*Department of Surveys*)
- iv. Production of Registry Index Maps (RIMS) and Final Area Lists (*Department of Surveys and Land Registry*)

c) Identification and verification of beneficiaries

- i. Actual ground verification exercise (*Settlement Division*)
- ii. District Settler Selection Committee interviews the applicants and comes up with the proposed list of beneficiaries
- iii. District Settlement Officer forwards list to Director of Land Adjudication and Settlement
- iv. Director forwards to Minister for approval through the PS

v. Minister approves allocation

d) Allocation Procedures

- i. Issuance of Letters of offer (given 90 days to accept offer)
- ii. Issuance of allotment documents after beneficiaries pay 10% deposit land charge
- iii. Issuance of land development loans

e) Transfers (Sales, Gifts, Succession, etc)

- i. Witnessing of transfer documents by settlement officer
- ii. Valuation of property for purposes of Stamp Duty by government valuer
- iii. Conveyancing by Registrar of Titles in the Department
- iv. Actual transfer

f) Land and Development Loans Repayment

- i. Issuance of loan Demand Notices
- ii. Processing of full balance forms (Appendix B) by the District Settlement Officer
- iii. Full balance processing by Accounts Section, Settlement Fund Trustees (SFT)
- iv. Land and development loans clearance by Chief Accountant, SFT

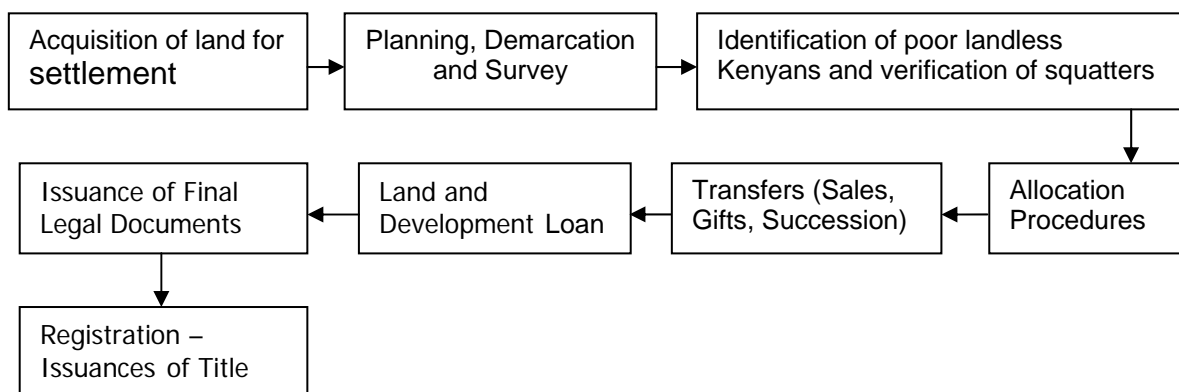
g) Issuance of Final Legal Documents

- i. Preparation of Transfer and Discharge of Charge– (*Settlement*)
- ii. Signing and sealing the Transfer and Discharge of Charge to facilitate issuance of Title Deed – (*PS*)

h) Registration

Issuance of Title Deed – (*Land Registration Division*)

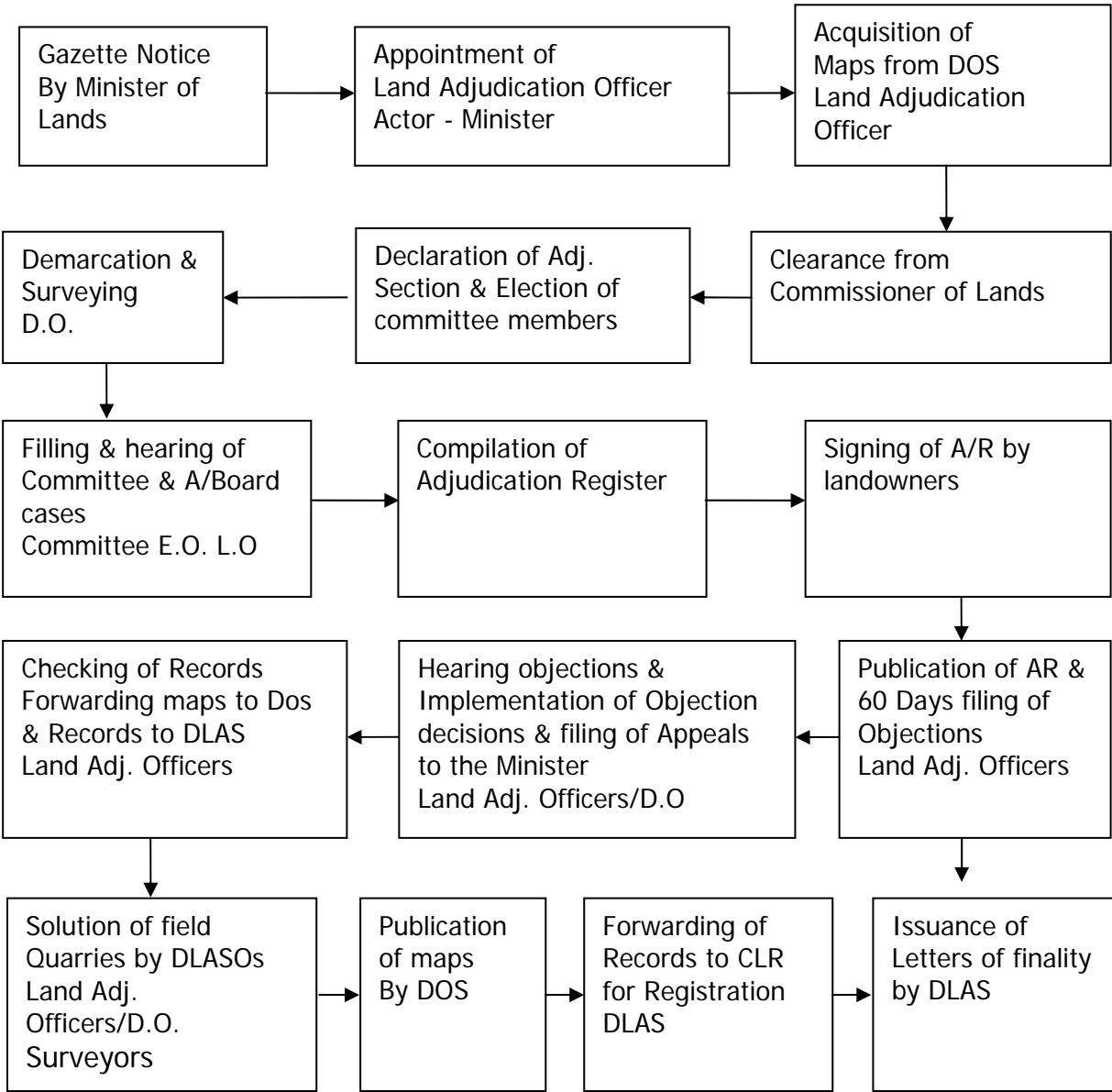
Diagram 2.4(1): Flow of Activities in Settlement



2.1.2 Land Adjudication Processes

- i. Gazette Notice By Minister of Lands
- ii. Appointment of Land Adjudication Officer Actor – Minister
- iii. Acquisition of Maps from DOS Land Adjudication Officer
- iv. Demarcation & Surveying D.O.
- v. Declaration of Adj. Section & Election of committee members
- vi. Clearance from Commissioner of Lands
- vii. Filling & hearing of Committee & A/Board cases Committee E.O. L.O
- viii. Compilation of Adjudication Register
- ix. Signing of A/R by landowners
- x. Checking of Records Forwarding maps to Dos & Records to DLAS Land Adj. Officers
- xi. Hearing objections & Implementation of Objection decisions & filing of Appeals to the Minister Land Adj. Officers/D.O
- xii. Publication of AR & 60 Days filing of Objections Land Adj. Officers
- xiii. Solution of field Quarries by DLASOs Land Adj. Officers/D.O. Surveyors
- xiv. Publication of maps By DOS
- xv. Forwarding of Records to CLR for Registration DLAS
- xvi. Issuance of Letters of finality by DLAS

Diagram 2.4(2): Flow of Activities in Land Adjudication



2.5 Strengths of the Ministry in Service Delivery

The following have been identified as the common strengths in the four Technical Departments in the Ministry:

- There are Land Administration Procedures in practice
- Well laid down structures and frameworks
- Well trained and skilled manpower available
- Established Taskforce on automation of all the Ministry Land records
- A wealth of land data
- On-going public sector reforms
- Political Goodwill
- Vision 2030, Country Vision
- Training opportunities in GIS based LIMS
- There is Donor support.
- Infrastructure (LAN) already exists in Ardhi House
- Existence of e-Government that supports computerization in the Government
- Existence of a Draft National Land Policy
- Increased demand for land services
- Availability of modern technology in Information management

2.6 Challenges and Weaknesses in Service Delivery

The following have been identified as the common challenges facing the four Technical Departments in the Ministry:

- Records are manual, voluminous and hence vulnerable to wear and tear, loss/missing, fraudulent/illegal alterations, illegible
- The titles are too big for handling and storage especially those issued under the Registration of Titles Act; e.g. New Grants, Certificates of Titles etc.
- Lengthy, slow and cumbersome processes
- Inefficient monitoring and evaluation system
- Duplication of land records
- Non sharable analogue data
- Lack of up to date land Information

- Poor storage and tedious retrieval of land data
- Backlog of the un-digitized maps is overwhelming
- Use of un-rectified photo enlargements as worsened the already weak general boundary system
- Lack of real Time Data Service GPS Control Points.
- No capacity to provide Magnetic declination data on time
- No capacity to provide Geoidal modulation data
- No common coordinate system in use
- The existing computer based information systems are stand-alone, insecure, low scale operations.
- Inadequate funding.
- WAN not yet developed to allow data sharing
- Inadequate human capacity
- Insufficient hardware and software for digital data processing
- Limited skills and awareness on modern Information Management Technology
- Failure to keep pace with the fast changing technology.
- Use of archaic/obsolete equipment (stamp duty machine, deed plan sealing machine, stereo plotters, printing machine, full balance machine (SFT)
- The practice is hampered by continued cases of missing files and at times proprietors are requested to swear an affidavit and indemnify the government for missing Titles before another file is opened.
- Lack of back-up for both manual and digital records
- Poor attitude towards change
- Vulnerability of the manual records in case of a disaster like fire
- Forgeries

3 Chapter 3 Identification of the Key Land Records for Computerization

This Chapter identifies the type of land records that need to be computerised and the method of data capture. Records which need to be updated and reconstructed before computerization are also identified.

3.1 Land Records for Capture and Computerisation

In the previous chapter, we have seen the various work procedures within the Ministry of Lands in respect to departments. These procedures use and create data, and to computerise them requires digitization. In order to digitize the data their volume must be known so as to lay down the digitization plan.

Below is a table indicating the type of data per department/division, their estimated volume and well as the most appropriate method of data capture:

Table 3.1(1): Types and Volumes of Key Land Records for Computerization

Department/ Division	3.1.1 Type of Land Record	3.1.2 Estimated No. of Records	3.1.3 Method of Data Capture
Department of Surveys, Cadastral Division	Survey Plans	70000 plans 3000000 parcels	Scanning and Vectorizing
	Survey Computation files/ sheets	70000 files (3500000 pages)	Scanning
	RIMs/ parcels	1000 map (500000 parcels)	Scanning and Vectorizing
	Area List sheets /records	25000 sheets	Scanning
		750000 records	Data entry
Survey Reports & other files sheets	6000000 sheets	Scanning	
Department of Surveys, Mapping Division	Map of Scale 1 in 250000	49 maps	Scanning and Vectorizing
	Map of Scale 1 in 100000	91 maps	Scanning and Vectorizing
	Map of Scale 1 in 50000	506 maps	Scanning and Vectorizing
	Other maps	50 maps	Scanning and Vectorizing
Department of Surveys, Adjudication Division(Nairobi And Districts)	RIMs & PIDs/ parcels	25000 maps (3000000 parcels)	Scanning and Vectorizing
	Photo Enlargements,	50000 photos	Scanning
	Mutation Forms sheets	3000000 sheets	Scanning
	Area List	200000 sheets	Scanning
		3000000 records	data entry
Surveyor Reports sheets	350000 sheets	Scanning	
Department of Survey, Geodetic & GIS Division	Aerial Photographs	100000 photos	Scanning
	Photo Positives	100000 positives	Scanning
	Geodetic Trig Charts	1200 charts	Scanning
	Geodetic Trig control cards	6000 cards	Data entry
Department of Land Adjudication and Settlement- Land Adjudication Division	Adjudication records	4000000 records	Scanning and Data entry
	Land Adjudication Maps (R.I.Ms)	18000 maps	Scanning
	District Diagrams	80 diagrams	Scanning
	Group Ranches Members Registers	400000 registers	Scanning and data entry
	Appeal Case Files	1300000 pages	Scanning
	National Land Adjudication Progress Map	1 map	Scanning and Vectorizing
	Committee Cases Proceedings	22000000 pages	Scanning
	Arbitration Board Cases Proceedings		
Objection to A/R Cases Proceedings			

Department/ Division	3.1.1 Type of Land Record	3.1.2 Estimated No. of Records	3.1.3 Method of Data Capture
	Group Ranches Incorporation Certificates	800 sheets	Scanning and data entry
	Land Adjudication Progress Chart	500 sheets	Scanning
		60000 records	Data entry
	Appeals to the Minister Case Proceedings	1300000 pages	Scanning
	Group Ranches Minutes	14000 pages	Scanning
	Declaration Notices	16000 sheets	Scanning
	Completion/Publication of AR Notices		Scanning
	Certificate of Finality		Scanning
	Court Case Files	15000 files	Scanning
	Objection Lists	18000 sheets	Scanning
		540 000 entries	Data entry
Demarcation Books	2300000 pages	Scanning and data entry	
Periodical Progress Reports	5000 pages	Scanning	
Department of Land Adjudication and Settlement- Settlement Division	Letters of offer	250,000 pages	Scanning
	Land charge	250,000 pages	Scanning
	Ancillary agreement	250,000 pages	Scanning
	Condition of offer	250,000 pages	Scanning
	Devt. loan documents	100,000 pages	Scanning
	Appendix A-E forms	200,000 pages	Scanning
	Certificate of outright purchase	100,000 pages	Scanning
	Transfer and discharge	150,000 pages	Scanning
Department of Lands -Land Administration Division	Correspondence Files with running numbers, General Files -Alienation and Town Planning Files	270000 files (21000000 pages)	Scanning
	Subdivision Scheme Files	375000 files (11200000 pages)	Scanning
	Semi-Current (Closed)	206000 files (37080000 pages)	Scanning
	Building Plan Files	97000 files(500000 pages)	Scanning
	Binders - Grey Books	105 books (94500 pages)	Scanning
	Cash and Documents Register	16 registers(1000 pages)	Scanning
	Name Cards	634000 cards	Scanning
	File Tracing Cards	633520 cards	Scanning
SPRO Plans and maps	1800 maps	Scanning	
Department of Lands -Valuation Division	Valuation Reports (Nairobi - Urban)	80000 Reports (160,000 Pages)	Scanning
	Valuation Cards (Nairobi – Urban)	250,000 Cards	Scanning
	Valuation Reports(Urban General & Districts)	250000 Reports (500,000 Pages)	Scanning
	Valuation Reports(Estate Duty)- Nairobi & Districts	2000 Reports (4,000 Pages)	Scanning
	Valuation Reports(Government Leasing Nairobi & Districts)	4000 Reports (8,000 Pages)	Scanning
	Valuation Reports(Owner Occupied)- Nairobi & Districts	17000 Reports (34,000 Pages)	Scanning
	Valuation Reports(Government Projects, Compulsory Acquisition ,Parastatals - Nairobi & Districts)	1500 Reports (6,000 Pages)	Scanning
	Valuation Rolls (Rating)	300 (250,000 reports)	Scanning
	Value and Determining Variables	500000 entries	Data entry
Department of Lands - Land Registration Division	Titles registered under RTA and GLA(Nairobi)	190000 (3000000 pages)	Scanning
	Documents registered in Volume books N ,H and IPA, PS and D1 registers	80volumes , (40000 pages)	Scanning
	Titles registered under RLA (Districts)	3,800,000 sheets	Scanning
Department of Physical Planning	Part Development Plans	50000	Scanning and Vectorizing
	Physical Development Plans	100	Vectorize
	Vetting Forms	1000 forms	Scan and data entry

Department/ Division	3.1.1 Type of Land Record	3.1.2 Estimated No. of Records	3.1.3 Method of Data Capture
	Correspondence files	2500000 pages	scanning
	Reports(planning briefs, regional planning, policy papers)	5000 pages	Scanning
	Registers	10000 pages	Scanning and data entry
	Minutes	1000 pages	Scanning

3.2 Updating of Land Records in the Ministry

Within the Ministry of Lands, there are two types of records; those that require updating and those that do not require updating. In the process of computerization the most sensitive records are those that undergo updating, since the changes must be reflected in real time. This section presents land records that require frequent updating in each department.

3.2.1 Department of Surveys

- i). **Registration Index Maps (RIMs):** Updating is always done whenever there is a new survey (under the Registered Land Act) such as new grant or subdivision of property within the extent of the RIM. Data source is the survey plan under fixed boundaries and mutation form under general boundaries.
- ii). **Preliminary Index Diagrams (PIDs):** Updating is always done whenever there is a new survey (under the Registered Land Act) such as new grant or subdivision of property within the extent of the PID. Data source is uncertified aerial photograph from Department of Surveys and the demarcation survey data from Department of Land Adjudication and settlement; and mutation form under general boundaries.
- iii). **Topo-cadastral maps (Chartings):** Updating is done whenever there is a new survey. Data source is the survey plan.
- iv). **Parcel cards:** Whenever a new survey is registered, the history details of the parcel are entered in a card. Data source is the survey plan under fixed boundaries and mutation form under general boundaries
- v). **Topographical Maps:** For maintenance of up to date maps, it is a requirement that the Department of Surveys captures all new developments throughout the country on these maps at various scales. Data sources include field survey, photogrammetry and remote sensing.
- vi). **Correspondence Files on Survey Records:** These are used for filing internal and external communication. The correspondences are cumulative and need to be filed on time as they are received.
- vii). **Land Adjudication Progress Chart.** Data source is the Adjudication Division, Department of Land Adjudication and Settlement.

3.2.2 Department of Physical Planning

- i). **Physical Development Plans:** They are updated when there is a change of user or extension of user. An update is also done at the expiry of the plan period to capture the changing environment. Data sources include Part Development Plans, Survey records (RIMs, PIDs, topographical maps and imageries) and field surveys.
- ii). **Correspondence Files On Physical Planning Records:** These are used for filing internal and external communication. The correspondences are cumulative and need to be filed on time as they are received.

3.2.3 Department of Lands

- i). **Land Rent Cards:** These cards need to be updated whenever there is enhancement in land rent, rent payment and Change of ownership attributes upon transfer or by request. Also new cards for subplots are opened when a subdivision is done.
- ii). **File Movement Cards:** Whenever a file moves out of the Records office, the date, the office number, receiving officer and the collecting officer are noted in the file movement card.
- iii). **Correspondence Files On Lands Records:** These are used for filing internal and external communication. The correspondences are cumulative and need to be filed on time as they are received.
- iv). **Topo-Cadastral Maps at SPRO:** Noting and charting land status
- v). **SPRO Land Records Cards:** The noting of Land reference number, Correspondence File numbers, tenure, term of leasehold if leasehold, cadastral Folio Registration number (F/R No.), plot size, plot status. Data source is the correspondence file.
- vi). **Valuation Cards:** Land reference number, Correspondence File numbers, tenure, term of leasehold if leasehold, plot size, User, value/ land rent, purpose of valuation, date of valuation, transferee, transferor, valuation reference number. Data source is the valuation reports.
- vii). **Deed Files:** Registration of Transfers, charges, discharges, mortgages, assents, caveats and court orders. Data source are these legal documents presented by the presentors and copies of other previously registered documents, title deed inclusive, in the deed file.
- viii). **Green Cards:** Registration of Transfers charges and discharges. The data source is as indicated in the 'vii' above
- ix). **GLA Volumes:** Registration of Indentures, Conveyance, Mortgage, reconveyance of mortgage, transmissions, court orders, caveats and removal of caveats. The data source is as indicated in the 'vii' above
- x). **IPA Register (Power of Attorney):** Registration of grant and revocation of power of attorney. Data sources are these legal document presented by the presentor.

- x). **Perpetual Succession File:** Registration of Change of trustees. Data source is an application by the previous trustees

3.2.4 Department of Land Adjudication and Settlement

- i). **Adjudication Records:** these are updated whenever there is a decision on an objection case or appeal to the Minister. Data source is the case ruling.
- ii). **Settlement Plot Files;** these are updated on documentation of the plot owner when there is a succession or transfer on computation and payment of full balance and on discharge
- iii). **Appeal Case Files:** Updated upon completion of an appeal case. Data source is the case ruling.
- iv). **Group Ranch Registers;** these are updated upon change of membership. Data source is the resolutions from the members Annual General Meetings
- v). **Correspondence Files On Adjudication Land & Settlement Records:** These are used for filing internal and external communication. The correspondences are cumulative and need to be filed on time as they are received.

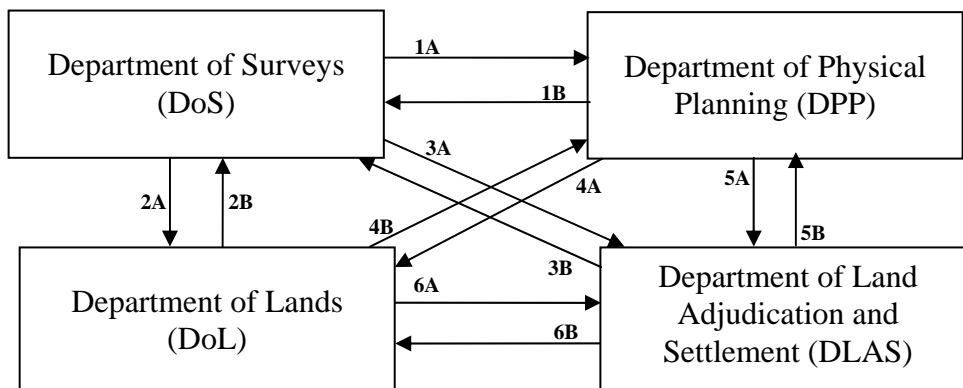
4 Linkages across the Departments

4.1 Internal Linkages in Service delivery

The work flow diagrams in chapter 2 indicate the flow of processes, procedures and their linkages within each department. This chapter explores the inter-linkages across the Departments indicating clearly the key land records shared and exchanged between Divisions and Departments in the Ministry.

Most of the land services offered by the ministry demand that key land data be shared across the four technical departments and hence inter-linkages between them are inevitable as depicted in the diagrammatic explanation hereunder.

Diagram 4.1(1): Departmental Inter-linkages



4.1.1 Linkage between Departments of Surveys and Physical Planning

(1A) Flow of Data from DOS to DPP

i). Aerial Photographs, Orthophotos and Machine Plots

These are obtained from the Geodetic and GIS Division of the Department of Surveys. They are used for preparation of base maps by the Physical planning Department.

ii). Topographical Maps, Topocadastral maps and Thematic Maps

These are obtained from the Mapping Division of the Department of Surveys. They are used for preparation of base maps by the Physical planning Department.

iii). RIMs, PIDs and Survey Plans

These are obtained from the Cadastral and Adjudication Divisions of the Department of Surveys. They are used for preparation of base maps by the Physical planning Department.

(1B) Flow of Data from DPP to DOS:

Approved Physical Development Plans

These are obtained from Physical planning Department. They are used by the Cadastral Division as basis of carrying out cadastral surveys.

4.1.2 Departments of Surveys and Lands

(2A) Flow of Data from DOS to DOL:

i). Survey Plans

These are obtained from the Cadastral division of the Department of Surveys. They are used to guide cartographers based in SPRO in Land administration division to note the location of parcels of land within a surveyed area. They are also for confirming plot areas in rent apportionment in the Valuation Division.

ii). Topocadastral Maps

These are obtained from the Cadastral division of the Department of Surveys. They are used together with survey Plans for locating properties on the ground by valuers, land officers and cartographers.

iii). Deed Plans

These are obtained from the Cadastral division of the Department of Surveys. They are final documents after cadastral survey is completed on land held under Registration of Titles Act (RTA) and Government Land Act (GLA). They are used in both the Land administration and Land registration divisions to prepare titles under these Acts.

iv). RIMs

There are two types of RIMs: RIMs prepared under RLA Cap 300 section 22 (fixed boundary surveys) are obtained from the Cadastral division of the Department of Surveys. RIMs prepared under RLA Cap 300 (general boundary surveys) are obtained from both the Cadastral division and the adjudication division of the Department of Surveys.

These RIMs are the final documents after survey is completed for land which is to be registered under the registered land Act (cap 300) land Registration Division. They are used for locating parcels of land on the ground by valuers in Valuation Division. They are also used by Land officers in Land administration Division in preparation of Title Deeds and Certificate of Lease. Finally they are used by the Land Registrars in issuance of Leases and Title Deeds.

v). PIDs

PIDs prepared under RLA Cap 300 (general boundary surveys) are obtained from the adjudication division of the Department of Surveys. They are also final documents prepared under Cap 300

vi). Area List

These accompany both the RIMs and PIDs. They contain the sizes of plots which are used in registration of title deeds and certificate of leases.

(2B) LANDS – SOK

i). Letters of Allotment

Copies of letters of allotment are obtained from the Land Administration Division of the Department of Lands. They are used to ascertain authenticity of allotted lands when carrying out Cadastral/Title surveys.

ii). Letters of Consent

Copies of letters of consent are obtained from the Land Administration Division of the Department of Lands. They are used to request for subdivision surveys

iii).Letters of Indent

Indent Letters are obtained from the Land Administration Division of the Department of Lands. They are used to request for Deed Plan or RIM

4.1.3 Departments of Surveys and Land Adjudication & Settlement

(3A) SOK – DLAS

i). Photo-enlargements,

These are obtained from the Adjudication Division of the Department of Surveys. They are used for demarcation in adjudication sections

ii) RIMs and PIDS

These are obtained from the Cadastral and Adjudication Divisions of the Department of Surveys. They are used for registration of settlement schemes and Adjudication sections

iii) Area List

These accompany both the RIMs and PIDs. They contain the final sizes of plots which are used in registration of title deeds and certificate of leases.

(3B) DLAS – SOK

i). Demarcation Data (Contained on Photo-enlargements)

These are obtained from the Adjudication Divisions of the Department of Land adjudication and settlement. These contain parcel boundaries as picked on the ground and numbers as assigned by the demarcation officer. They are used by Adjudication Division of Department of Surveys to prepare final registration maps, RIMs or PIDs.

ii). Preliminary Area List

These accompany Photo-enlargements. They contain map and parcel numbers as assigned by the demarcation officer.

4.1.4 Departments of Physical Planning and Lands

(4A) PPD – LANDS

Approved Physical Development Plans

These are obtained from the Department of Physical Planning. They are used for alienation and record keeping by the Land Administration Division of the Department of Lands. They are also used for preparation of valuation rolls by the Valuation Division of the Department of Lands.

(4B) LANDS – PPD

Letters of Request to prepare Physical Development Plans

These are obtained from the Department of Lands. They are used for requesting for planning of special areas such as Public utilities and Institutions by the Land Administration Division of the Department of Lands.

4.1.5 Departments of Physical Planning and Land Adjudication & Settlement

(5A) PPD – DLAS

Approved Physical Development Plans

These are obtained from the Department of Physical Planning. They are used for Demarcation and Survey in settlement schemes by the Settlement Division of the Department of Land Adjudication and Settlement.

(5B) DLAS – PPD

Letters of Request to prepare Physical Development Plans

These are obtained from the Department of Land Adjudication and Settlement. They are used for requesting for planning of Settlement Schemes by the Settlement Division of Department of Land Adjudication and Settlement.

4.1.6 Departments of Lands and Land Adjudication & Settlement

(6A) LANDS – DLAS

i). Valuation Report

These are obtained from the Valuation Division of the Department of Lands. They are used as a guide for purchase of land for settlement purposes by the Settlement Division of Department of Land Adjudication and Settlement.

ii). Clearance

These are obtained from the Land Administration Division of the Department of Lands. They are used to confirm the status of land within a Trustland area to determine whether any land has been set apart by the Adjudication Division of Department of Land Adjudication and Settlement.

iii). Transfer Document

These are obtained from the Land Registration Division of the Department of Lands. They are used to transfer Government Land to Settlement Fund Trustees in the Settlement Division of the Department of Land Adjudication and Settlement for settlement purposes.

(6B) DLAS – LANDS

i). Original Adjudication Records

These are obtained from the Land Adjudication Division of the Department of Land Adjudication and settlement. They are used by the Land Registration Division in preparation of Titles to land.

ii). Discharge of Charge and Transfer

These are obtained from the Settlement Division of the Department of Land Adjudication and settlement. They are used by the Land Registration Division for issuance of Titles to land.

Table 4.1(1): Summary of the Flow of Key Land Records across the Departments

No.	Link	Data Work Flow		Linkage Key Data Type	Remarks
		From	To		
1	1A	DOS	DPP	Aerial Photographs, Orthophotos, Machine Plots, Topographical Maps, Topocadastral maps and Thematic Maps, RIMs, PIDs and Survey Plans	
2	1B	DPP	DOS	Approved Physical Development Plans	
3	2A	DOS	COL	Survey Plans, Topo-Cadastral Maps Deed Plans, RIMs, PIDs & Area Lists.	
4	2B	COL	DOS	Letters of Allotment, Consent & Indent.	
5	3A	DOS	DLAS	Enlarged Aerial Photos, RIMs & PIDs & Area Lists.	
6	3B	DLAS	DOS	Demarcation Data (Contained on Photo-enlargements)	
7	4A	DPP	COL	Approved Physical Development Plans	
8	4B	COL	DPP	Letters of Request to prepare Physical Development Plans	
9	5A	DPP	DLAS	Approved Physical Development Plans	
10	5B	DLAS	DPP	Letters of Request to prepare Physical Development Plans	
11	6A	COL	DLAS	Valuation Report, Clearance, Transfer Document	
12	6B	DLAS	COL	Original Adjudication Records, Discharge of Charge and Transfer	

Table 4.1(2): Summary of the Flow of Key Land Records in the Department of Lands

No.	Data Work Flow		Linkage Key Data Type	Remarks
	From	To		
1a	Land Admin	Valuation	Request for Valuation	
1b	Valuation	Land Admin	Valuation Reports	
2a	Land Admin	Land Registration	New grants Extension of Lease Application for registration of new Deed Plan/RIM	
2b	Land Registration	Land Admin	Titles, MRT	
3a	Valuation	Land Registration	Property Valuation Reports	
3b	Land Registration	Valuation	Searches & Valuation Requests	

4.2 External Customer Linkages in Service Delivery

4.2.1 Categories of External Key Customers

- National Government Institutions
- Private Practice
- Professional Bodies
- Regional & International Bodies
- Academia
- Members of General Public

4.2.2 Organizations that frequently interact with the Ministry

- Nairobi City council
- Other local authorities
- Cooperative societies
- Land buying companies
- Group Ranch Members
- Kenya Revenue Authority
- State Law Office (AG Chambers)
- Land Control Board
- Land Dispute Tribunals
- Ministry of Roads
- The Police Department
- Provincial administration
- KACC
- Ministry of Finance
- NEMA
- KWS
- Kenya Railways
- Government Printer
- KPLC
- RCMRD
- Physical planning Liaison Committees
- Kenya Forest Service

4.2.3 Key Customer Service Points and Services Offered in the Departments

Table 4.1(3): Key Customer Service Points and Services Offered in the Departments

Department	Service Point	Service Offered	Remarks
Lands	Registry counter (Ground floor, wing B Ardhi House and district Land Registries)	Collection of application forms	Application forms are downloadable from www.ardhi.go.ke Sensitization needed
		Enquiries	Can be provided via internet/SMS once databases are created
		Booking of documents for registration	DMS to be used once documents booked to enable enquiries via internet/SMS once databases are created
		Official Searches	Can be provided over the counter once databases are created. Will be provided via internet/SMS once necessary legal framework is in place
		Collection of registered documents and searches	Once booked give timeframe because it will be tracked in the DMS system
	Banking hall (stamp duty and land rent counters)	Assessment of stamp duty payable	Assessment real time
		Land rent demand notices issues	Can be provided via internet/SMS once databases are created. Updating should be online.
		Issuance of Land clearance certificates	Can be provided over the counter once databases are created. Will be provided via internet/SMS once necessary legal

Department	Service Point	Service Offered	Remarks
			framework is in place
		Purchase of revenue stamp	Purchase is real time
	Cashiers in banking hall	Payments due to COL (fees for registration, consent, stand premium, etc)	Payment is real time
	Registrars Offices	Booking of Perpetual succession Trusts and provisional Certificates of Title	Once booked give timeframe because it will be tracked in the DMS system
	File Records	Retrieval of files for clients	Once the data base is created and up to date there won't be any need of clients going to records office
	Cash and document	Applications for consent and Clearance Certificate. Receive all mails addressed t the COL.	DMS should be put in place
	Central Registry(RS)	Distribution of documents for registration	DMS should be put in place
	Plan records office	Enquiry on file number	Once the data base is created and up to date there won't be any need of clients going to records office
	Collector of stamp duty office	Application for valuation for stamp duty.	Application forms should be made available on www.ardhi.go.ke
		Endorsement of valuation on documents.	Immediate
		Letters of demand for additional stamp duty	Immediate
Physical Planning	Registry	Mails receiving	All mails to DPP. Need to have a MIS and file tracking system
	Accounts	Receive payment on services rendered (AIA)	Immediate. Need to create a computer based accounting system
	Plan Records Office	Sale of plans	Immediate
Survey	Registry	Mails receiving	All mails sorted. Need to have a MIS and file tracking system
	Accounts	Receive payment on services rendered (AIA)	Immediate. Need to create a computer based accounting system
	SRO Cadastral Division	Enquiries on parcel history	Can be provided over the counter once databases are created. Will be provided via internet/SMS once necessary legal framework is in place
		Sale of Survey Plans	Finalise scanning & Vectorization
		Issuance of RIMs(under fixed boundary surveys)	Finalise Vectorization
		Sale of Topocadastral Maps	Vectorize & Update
		Issuance of Deed Plans	Commence Scanning
		Issuance of Area Lists	Create Database

Department	Service Point	Service Offered	Remarks
		Receiving and registration of Survey Jobs (Computation sheets, field notes, survey plans & approval documents)	Finalise creation of Database and develop a File Tracking System.
	Adjudication Survey Records Office, Adjudication survey Division	Issuance of RIMs (under general boundary surveys)	Vectorize
		Issuance of PIDs (under general boundary surveys)	Carry out GPS field surveys and vectorize
		Issuance of Area Lists	Create Database
		Issuance of Enlarged Aerial Photos.	Create Database and Commence Scanning
		Issuance of Mutation forms	These are serialised
	Photogrammetric Unit, Geodetic & GIS Division	Sale of Aerial Photographs	Create Database and Commence Scanning Requires clearance from DOD
		Sale of Orthophotos,	Create digital Database and Commence Scanning
		Sale of Machine Plots	Create digital Database and Commence Scanning
	Geodetic Unit, Geodetic & GIS Division	Sale of Survey control data	Finalise creation of Database
		Sale of Trigonometrical charts	Finalise creation of Database and commence scanning
		Calibration of Survey Equipments	Commence creation of Database Need to modernise Calibration Equipment
	Maps sales office, Mapping Division	Enquiries on maps	Create Database
		Sale of Topographical Maps	Requires clearance from DOD
		Sale of Thematic Maps	Doesn't require clearance from DOD. Real time
Adjudication and Settlement	Registry	Mails receiving Retrieval of files Management of file tracking system	All mails to DLAS. Need to have a MIS
	Cash office	Receiving and custody of SFT land and loan payments	Immediate. Need to create a computer based accounting system
	Records Office	Custody of accountability list, RIMs, PIDs and duplicate adjudication records	Create digital Database and scan records
	Customer Care desk	Receive and direct clients	To minimise congestion

5 Chapter 5 Current Status of Computerisation of Land Records in the Ministry

5.1 Introduction to Computerization Efforts in the Ministry

Chapters 1 to 4 above have presented the current situational analysis of the Ministry and the inherent challenges it faces, largely due to use of manual systems, in its efforts to offer service to Kenyans. The Ministry has had a number of initiatives in the recent past in its effort to address land information management using modern information technology (IT). These initiatives have been departmental specific and largely uncoordinated leading to un-sharable, stand-alone land data sets. However, due to their inter-linkages and inter-dependence the four Departments are expected to collaborate with one another to function efficiently and effectively. This Task Force was constituted to look into the matter and speed up the automation of the ministry's land records in an integrated methodical manner. In this chapter, we look at the current status of the computerization efforts in the Ministry and the key role that this Task Force has played.

5.2 RRI Strategic Challenge Thematic Area on Automation of Land Records

Barely a month after the appointment of the Task Force, the Ministry was put under RRI and the entire membership of the Task Force was made to constitute RRI Team on the strategic challenge area on Automation of Ministry's Land Records. Towards this goal the Team, identified five (5) RRI Goals for implementation during the first RRI phase of 100 days that was launched on 17th July 2007.

The following five RRI Goals were chosen to address the critical issues in the ministry relating to porous system, timeliness in service delivery, Ministry's image and tattered land records among others. These issues impact negatively on the image of the ministry as well as service delivery. When successfully implemented, these goals were expected to have a great impact on service delivery to all Kenyans and other stakeholders since staff productivity and efficiency would increase.

The strategic challenges areas are as outlined here below:-

5.2.1 Strategic Challenge Area 1: Reconstruction of GLA volumes/Records, Repairs of torn records in the Central Land Registry, Lands Registration Division

a) Goal: Reduce time taken to retrieve files and folios from volumes for action from 3 months to 2 days in the Lands Registration Division, Lands Department.

(b) Table 5.2(1): The Expected Outcome/Impact reconstruction of GLA Volumes

No.	NOW	AFTER
1	Searches are not easily done on some GLA volumes due to the poor state of the records.	Instant location of GLA files leading to timeliness in all land titles transactions
2.	Sometimes proprietors are being asked to avail an indemnity for any reconstruction to be done on some folios.	Reduce cases of missing files; the System will discourage 'brokers'

5.2.2 Strategic Challenge Area 2: Creating a Land /Property Value Database and Document Management System at the Valuation Division, Department of Lands

a) Goal: Reduce time taken to finalise valuation reports after field inspection from an average of 2 days to an average of 1 day.

(b) Table 5.2(2): The Expected Outcome/Impact of Property Valuation Database.

No.	NOW: Manual-Based Valuation Property Database	AFTER: Computer-Based Valuation Property Database
1.	After field inspection a valuer needs to do a market analysis to determine market values. Searching for data to complete valuation is a manual procedure. The files sometimes are out of the registry as such delay does occur when looking for the data	Valuation data available immediately from the Valuation Land/Property Database .
2.	A property may have been valued before. It is important to see the previous report. This involves manually looking for the file where the report was filed.	Valuation Report available on the networked computer terminals.
3.	Writing a valuation report is a tedious process. It involves describing the property in detail in terms of construction and accommodation.	A Computer Based Valuation System where the attribute values are fed in the system can generate well organized reports.

5.2.3 Strategic Challenge Area 3: Creating a Document Management System of all approved physical development plans for Department of Physical Planning.

a) Goal: Reduce time taken for vetting and verification of plans submitted for approval by the District Physical Planners from 3 days to 2 hours.

b) Table 5.2(3):The Expected Outcome/Impact of DMS for Physical Development Plans.

No.	NOW: Manual-Based Database for All Approved Development Plans in the Country.	AFTER: Computer-Based Database & DMS for All Approved Development Plans in the Country.
1.	Vetting and verification takes at least 3 days	Reduce time taken for vetting and verification to 2 hours
2.	Information is scattered and difficult to retrieve	Easy storage and retrieval
3.	Documents prone to loss, wear & tear	Secure storage and back up

5.2.4 Strategic Challenge Area 4: Creating a Document Management System of all authenticated survey plans at the Cadastral Division at the Department of Surveys.

a) Goal: Reduce time taken by officers, licensed surveyors and members of the public to access and retrieve any authenticated survey plans from an average of 2 days to 1 hour.

b) Table 5.2(4): The Expected Outcome/Impact of DMS for Authenticated Survey Plans.

NO	<i>NOW: Manual-Based Database for All Authenticated Survey Plans in the Country since 1903.</i>	<i>AFTER: Computer-Based Database & DMS for All Authenticated Survey Plans in the Country since 1903.</i>
1	Four steps are involved for a client to obtain a copy of a survey plan	A one-stop shop for clients to obtain a copy of a survey plan.
2	It takes 2 days and sometimes longer period to obtain a survey plan if it is available	It will take 1 hour to obtain a survey plan
3	Survey plans are prone to destruction in case of calamity	There will be a backup of all survey plans
4	There is a lot of movements/misplacement of survey plans	No movement/misplacement of survey plans
5	A survey plan can be used by only one officer at a time	A survey plan can be used by many officers at a time

Strategic Challenge Area 5: Creating a File Tracking System for all settlement plot files at Department of Land Adjudication and Settlement.

Goal: Reduce time taken to retrieve settlement plot files for action from an average of 2 days to 1 hour

b) Table 5.2(5): The Expected Outcome/Impact of File Tracking System for all Settlement Plot File

No.	NOW	AFTER
1.	Retrieval of files is cumbersome	Efficient location of settlement files
2	Lengthy settlement transactions	Timeliness in all settlement transactions
3	Delays in service delivery	Improved service delivery and customer satisfaction
4	Poor image	Improved image
5	Cases of missing files	Reduced cases of missing files

5.3 Results in 100 Days

5.3.1 Tattered Land Records Reconstructed

a) Results

At least 50 Title Registers of GLA Volumes/Records were identified for reconstruction. However, reconstructing of 12 GLA Volumes, Nos. N59 to N70, that had the most torn and tattered land records that were most active and were being used on a daily basis was considered. Each GLA Volume has an average of about 400 folios. So, 12 GLA Volumes have a total of 4,800 folios that were earmarked to be reconstructed during this RRI Period. A total of 2,686 (56%) out of the planned 4,800 folios for the 12 GLA Volumes were completed during the RRI Period and as shown below, we managed to complete reconstruction of four (4) GLA Volumes N59, N60, N61 & N62!

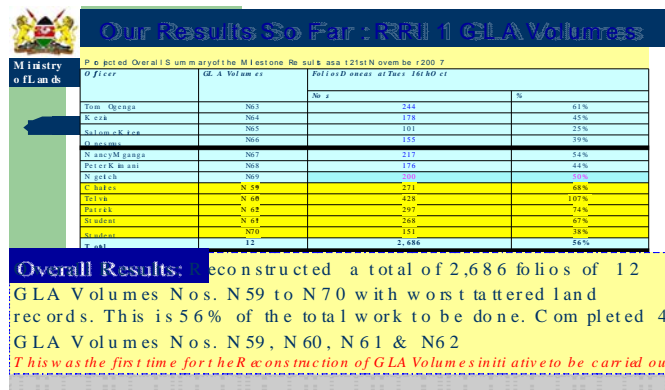


Diagram 5.3(1) GLA Volumes Reconstructed

b) Impact of the results

Searches & Registration of Documents for completed Volumes are easily done and this has improved efficiency on service delivery. Greater impact would have been achieved if all the identified 50 GLA volumes were reconstructed.

5.3.2 Computer-Based Valuation Data Base System Established

a) Results

After field inspection a valuer needs to do a market analysis to determine market values. Searching for data to complete valuation has always been a manual procedure. Now we have moved from Manual-Based Valuation System to Computer-Based Valuation System. All the valuation data records for the last one year are now available immediately from the Valuation Land/Property Database.

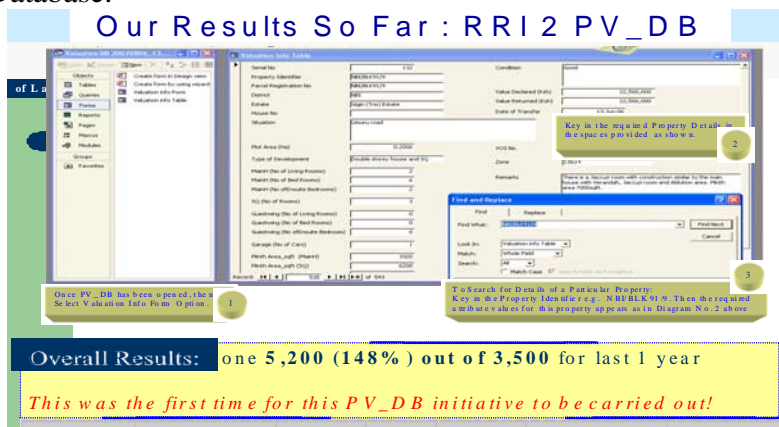


Diagram 5.3(2) Property Valuation Database (PV_DB)

We have designed a Property Valuation Data Base (PV_DB) System and we have captured all the 3,500 cases representing valuation data for the last one year (August 2006 to August 2007), into it as planned during the RRI period. We continued to capture data for previous years as well as data from valuations finalized after august 2007. So far, our output has now reached 5,200 cases.

b) Impact of the results

- i. Easy to access data (for the period covered) from the database
- ii. Easy to determine if property has been valued before within the period covered
- iii. Experience has been gained and will be used in planning and implementing other automation programmes.

5.3.3 Physical Development Plans Scanned

a) Results

There are about 5,000 approved Physical Development Plans (Development, Part Development, Zonal, Structural, Action and Advisory Plans) in the country at the Department of Physical Planning HQs. Out of these plans; about 430 are Development Plans (DPs), inclusive of Zonal, Structural, Action, & Advisory Plans). The rest are Part Development Plans.

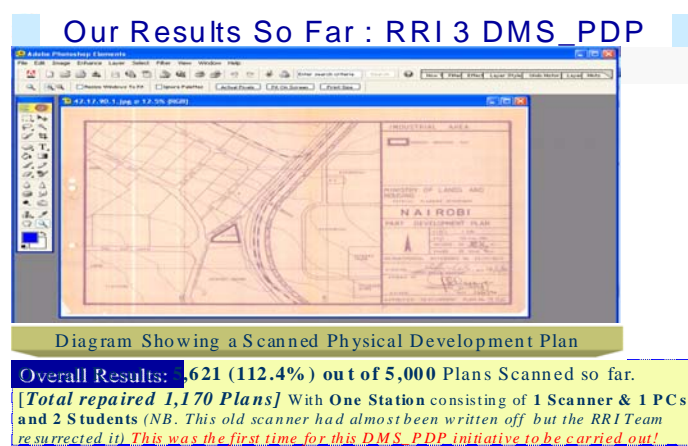


Diagram 5.3(3) Scanned Physical Development Plan

We have so far scanned 5,621 and repaired 1,170 approved plans out of 5,000 Plans that we had planned to do during the RRI period. This we achieved using only 1 Scanner, 1PC & 2 Students on attachment.

b) Impact of the results

- i.
- ii. There is now a backup of all approved physical development plans
- iii. A useful inventory of approved physical development plans is being developed
- iv. Experience has been gained and will be used in planning and implementing other automation programmes
- v. No possible loss or misplacement of the scanned approved physical development plans

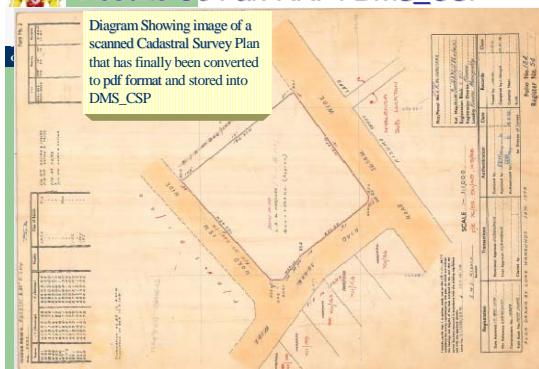
5.3.4 Cadastral Survey Plans Scanned

a) Results

There are about 65,000 Authenticated Survey Plans containing about 300,000 parcels in the country at the Cadastral Division of the Survey Department HQs. Out of these 4,000 plans had been scanned prior to the RRI period. We targeted to scan 15,000 Survey Plans with

available equipment but could have easily scanned all the 61,000 Plans if additional equipment were provided;-these could not be availed during RRI period as anticipated.

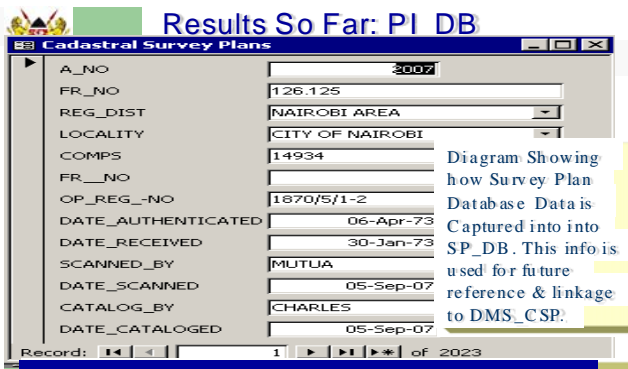
Results So Far: RRI 4 DMS_CSP



Overall Results: Data capture - Scanning of Survey Plans 13,540
Survey Plans scanned so far out of planned 15,000 Plans (90%)

Diagram 5.3(4) Scanned Survey Plan

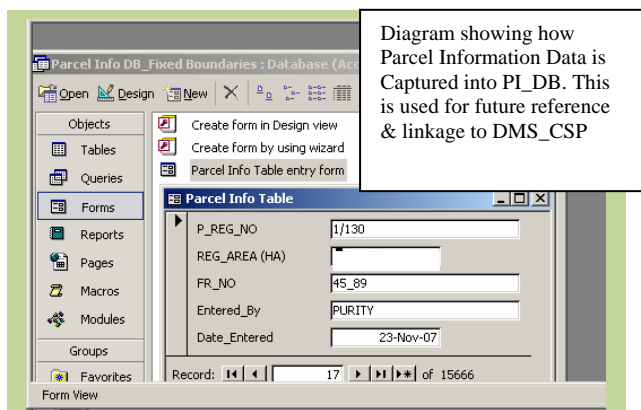
Results So Far: PI_DB



Overall Results: Data Capture - Survey Plans Data Entry into the Survey Plan Database (SP_DB)

This is the first time for the Survey Plans Data Base SP_DB initiative to be carried out!

Diagram 5.3(5) Data capture Survey Plan info entry



Overall Results :Data Capture – Parcel Data Entry into the Parcel Info Database (PI_DB)
23,339 (7.8%) Parcels entered out of 300,000. *This is the first time for the Parcel Info Database to be carried out*

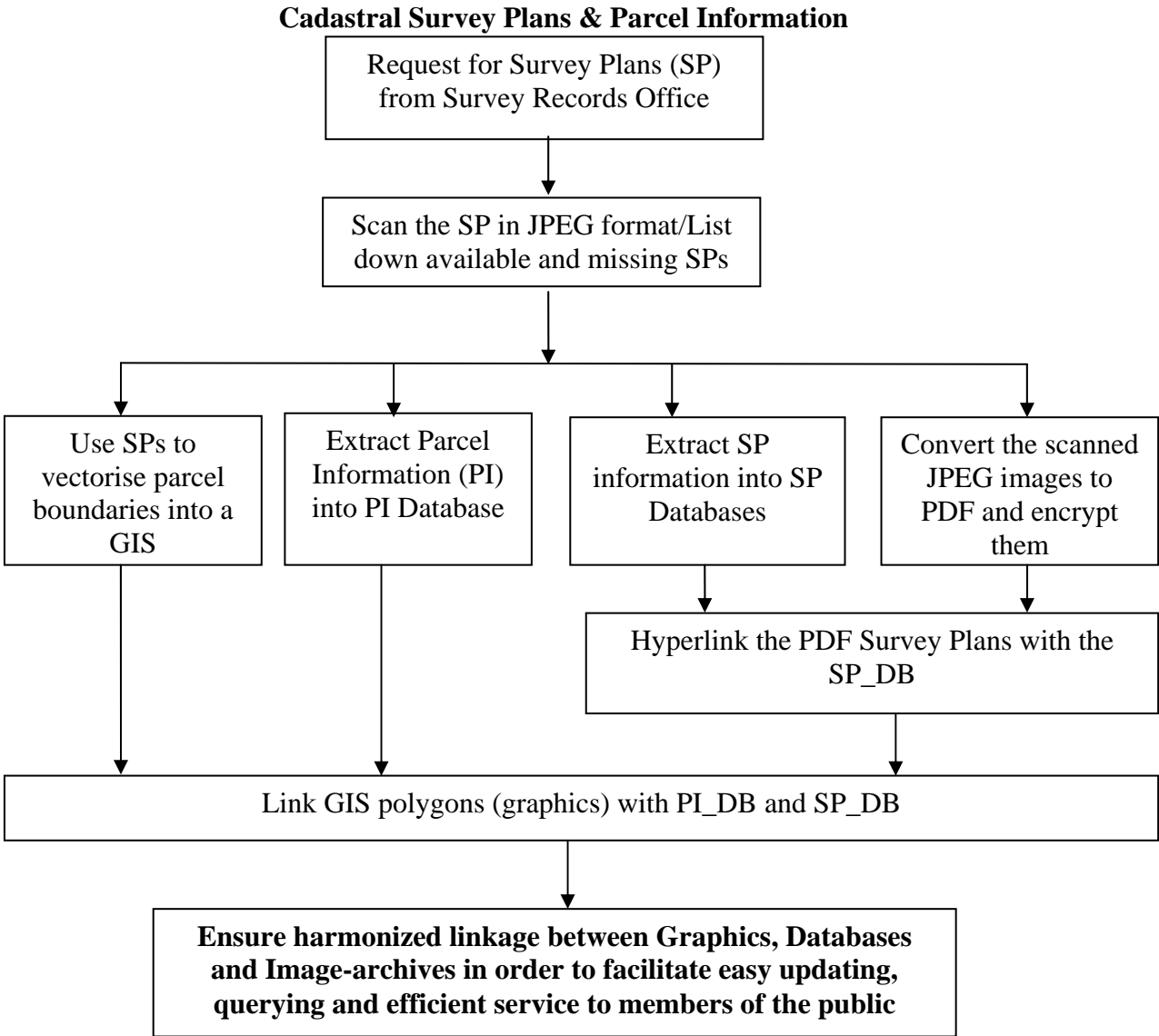
Diagram 5.3(6) Diagram showing how Parcel Information Data

It took the Department two (2) years to scan 4,000 Survey Plans before the RRI period. However, it has taken 100 days only for the RRI Team to scan 13,540 (90%) Survey Plans using same resources of **One Station** consisting of **1 Scanner & 2 PC**. This has drastically reduced time taken to obtain a scanned survey plan to within a few minutes. In addition to the scanning, a database for survey plans and another one for parcel information have been developed to enhance data retrieval.

b) Impact of the results

- i. There is now a backup of all scanned survey plans
- ii. A useful inventory of survey plans and parcels is being developed
- iii. A scanned survey plan is now being used by many officers at a time
- iv. Experience has been gained and will be used in planning and implementing other automation programmes
- v. It now takes less than 30 minutes to obtain a scanned survey plan
- vi. No possible loss or misplacement of the scanned survey plans
- vii. Inventory of Missing Survey Plans developed for every series

Diagram 5.3(7): General Flow of Activities in Cadastral Information Systems Section



5.3.5 File Tracking System Developed

a) Results

Based on the total number of allocation to the settlers, there should be about 220,000 Files opened. However, the actual files opened are about 110,000 and out of these 110,000 files, about 20,000 of them have inadequate information. The Director of Land Adjudication and Settlement has already sent letters to respective District Officers for the latter to provide any information on the unopened files.

A File Tracking System for Settlement Plot Files (FTS_SPF) has been developed into which some 89,778 (90%) out of the 110,000 settlement plot files have been imported from the Billing System currently being undertaken in the Department. All the attributes for the 140 staff and 4388 General files at the Ministry Headquarters have been captured into the file tracking systems. The System will display the current location of the file and history of the

movement of the file in the list. This system need to be duplicated in all the other departments.

The following Diagrams Show the File Tracking Systems for all Settlement Plot Files (FTS_SPF), Dept. of Lands Adj. & Settlement, HQs.



Diagram 5.3(7-1a) FTS_SPF File Tracking Centre -This is the home page for the File Tracking Module from where the various sub-modules can be accessed by clicking on the respective buttons.

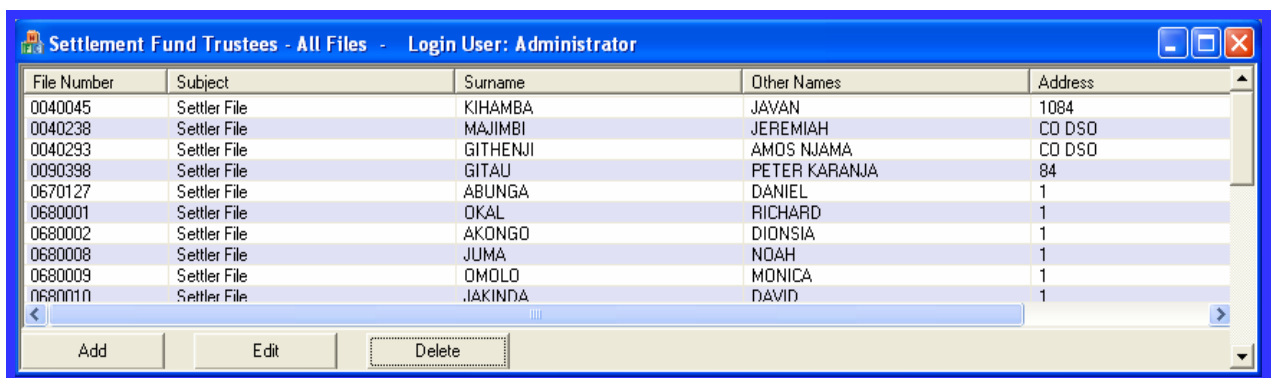


Diagram 5.3(7-1b) FTS_SPF Files Grid: This shows a grid of all the files tracked by the system. You can add new files by clicking the Add button and edit the details of existing files by selecting the file from the grid and then clicking the Edit button. To delete a file, select the file then click the Delete button.

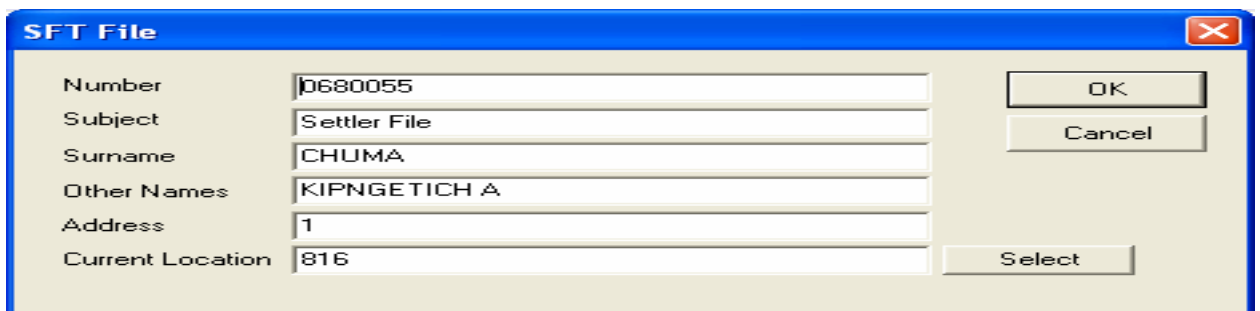


Diagram 5.3(7-1c) **FTS_SPF Adding/Editing File details:** The above form is used in managing (Adding/Modifying) files in the FTS_SPF system. (Please Note that it is only the System Administrator or Authorized Person has permissions to delete a file!!)

Title	Surname	Other Names	PIN Number	Office No.
REGISTRY	REGISTRY		816	816
ACCOUNTANT	KIOKO	J.C	P0067577	924
INTERNAL AUDITOR	MWAI	SARAH	P15468956	918
SECRETARY	JOYCE	JOYCE	P757645767	909
REGISTRY OFFICER	KAMAU	JAMES NJOGU	P78678587	816
SENIOR ACCOUNTANT	MARORO	J. O	P88789789	909
MACHINE MAN	MWENDA	ADRIAN	P97896785	924

Buttons: Add, Edit, Delete

Diagram 5.3(7-2a) **FTS_SPF Officers Grid** This grid shows all offices/officers authorized to handle files. New officers can be added, and existing ones be edited or deleted from the FTS_SPT System

Officer

PIN Number: P88789789

Title: SENIOR ACCOUNTANT

Surname: MARORO

Other Names: J. O

Office Number: 909

Buttons: OK, Cancel

Diagram 5.3(7-2b) **FTS_SPF Add/Edit Officer Details:** The above form is used in managing (Adding/Modifying Officers' Details into the system - Done by Authorized Person only!!)

Office/Officer: INTERNAL AUDITOR (MWAI SARAH (Room 918))

File Number	Subject	Surname	Other Names
5190024	Settler File	ALIGULA	HELEN K
5190028	Settler File	KITUTU	ERNEST SIMIYU
5190029	Settler File	MURIEMWE	GEORGE CHOMBA
5190030	Settler File	SIBOI	RICHARD
5190031	Settler File	MOLU	ALI MADO
5190032	Settler File	WANJALA	NAMUKOA
5190033	Settler File	MAGANA	THIONGO MUNYWA
5190034	Settler File	MUNIALE	JAPHET
5190046	Settler File	ZABLON	ABSOLOM NDULA

Diagram 5.3(7-3) **FTS_SPF FILES IN OFFICES -Tracking files in a given office:** This form assists in viewing files currently in a selected office. Select an office by clicking the Select button and the list of files in the selected office appears.

File Number	Names	Folio
5190024	ALIGULA HELEN K	3
5190028	KITUTU ERNEST SIMIYU	12

Diagram 5.3(7-4) FTS_SPF **ISSUING FILES** - File Issuing Form: This form allows the issue of one or more files by officers. Click the Add button to add files to issue and remove to remove files from the list. When satisfied with the list of files and the details of the origin and destination of the file(s), click OK to issue the files.

Date/Time Issued	File Number	Folio
<input type="checkbox"/> 29/08/2007 10:01:07	5190031	
<input type="checkbox"/> 29/08/2007 10:01:07	5190032	
<input type="checkbox"/> 29/08/2007 10:01:07	5190033	

Diagram 5.3(7-5) FTS_SPF **RECEIVING FILES - Files pending Receipt**: To view files issued to a given office, select the office by clicking the Select button. To confirm receipt of a file, check the Check-Box to the left of the file in the list.

Date	Source	Destination	Folio
29/08/2007 10:01:07	SENIOR ACCOUNTANT (MARORO [909])	INTERNAL AUDITOR (MWAI [918])	

Diagram 5.3(7-6) FTS_SPF **TRACKING FILES - File Tracking Form**: To track a file, enter the file number in the file number field. The current location of the file will then be displayed and the history of the movement of the specified file also displayed on the list. You may change the date ranges and click the Refresh button to view the history over any specified period.

Overall Results1: FTS_SPF 89,778 (90%) out of 110,000 Files as at 20071010

Overall Results2: Staff attributes 140–Done in 1 day

Overall Results3: Captured all the 4,388 General Files– Done in 12days only

b) Impact of the Results

- i. Have a back up of virtually all the Settlement plot and General files as well as all the Staff attributes at the headquarters
- ii. It is now easy to enter (key-in) additional files
- iii. Reduced cases of missing files
- iv. Efficiency in files retrieval

- v. An inventory of all settlement plot files

Please note that this is the first time for **all** the above initiatives to be carried out in this Ministry. After this initial phase, similar projects will be replicated in all other Departments/Divisions/Sections of the Ministry's Headquarters and in the District Offices all over the country. The Overall Summary of Results of the five (5) RRI Goals is as presented in Appendix 9.

5.4 Other ongoing Automation Projects

Other ongoing automation projects in which the Task Force Members have been actively involved include:

a) Document Management System for Land Records (Deed Files, Land Rent Cards & Green Cards)– Contracted out

This entails scanning, indexing and archiving of Lands Records at the Headquarters to create a Document Management System. So far (November 2007) a total of 244,620 Land Records (132,886 Land Rent Cards, 34,986 Green Cards and 75,895 Deed Files) producing 3.5 million images have been scanned and indexed. Archiving of these scanned records is in the progress. The Scanning of the remaining Land Records need to be continued either through renewal of contract, procuring a new contract or scanning them in-house.

b) Land Rent Information Database System – Being done in-house

This system is used for handling payment for land rent payers e.g. issuing demand notices to land rent payers. So far (November 2007) 151,000 parcels of land that attract rent have been captured into the system.

c) Settlement Fund Trustee (SFT) Billing System – Contracted out

This is a system intended to automate the billing and accounting processes for all settlement schemes in the country. Its objectives include: - Printing of settlers' bill statement on time; Recovery of SFT land and development loans; Enhancement of revenue collection; Management of settlers accounts and records; Timely production of final accounts; Assist in management and decision making on settlement schemes for overall efficiency in service delivery.

d) Land Information for Informal Settlements (LIIS) – With SIDA Assistance

GIS Based Methodology for mapping of informal settlements has been finalised. Evaluation of this project has already been done and is now awaiting recommendations on the way forward by the consulting team.

e) Establishment of Kenya National Spatial Data Infrastructure (KNSDI) and Production of Digital Topographical Maps– With JICA Assistance

The primary aim of KNSDI is to have an enabling platform of discovery and access of spatial information to facilitate data sharing through internet. KNSDI Web Site has been established and KNSDI Standards are being developed. Digital Mapping (Scales 1:2,500 & 1:5,000) of Nairobi has been finalised and Digital mapping of Mombasa has been started.

5.5 Challenges and Lessons Learned

5.5.1 Challenges

All the 5 RRIs were being done for the first time in the Ministry of Lands. This gave rise to the issue of Capacity Building. However, the main challenge was shortage of Resources both Human & Equipment - mainly Computers & Scanners.

The following were the major emerging issues and challenges:

- Inadequate Resources – Slow Procurement Process
- RRI Team members being changed midstream
- Initial Lack of Motivation for Students on Attachment
 - Students’ Production declining daily
 - Others are withdrawing altogether.
- Torn and Missing Land Records
- Change Management – Problem of Staff Attitude at the Work Place

Some members of staff are excited with change while others are indifferent. *Some staff comments “this is not the way we do things here; we have tried that before and did not work.”* The causes of the problem of change include; resistance to change, attitudes & mind sets of staff - not open to new ideas, fear of technology and fear of the unknown

Example of the Challenges: Reconstruction of GLA Volumes/Land Records

- Considered to reconstruct the most active GLA Volumes being used on a daily basis with most torn tattered land records.
- Identified 50 Title Registers of GLA Volumes /Records to be reconstructed
- Resources not availed as anticipated.
 - Procurement of the GLA Title Registers was a big challenge
 - Availed officers from the Department to recopy the information into the new GLA Title Registers but the pace was *very slow*.
 - Some GLA Folio’s are torn and others missing from the Registers.

5.5.2 Dealing with Challenges (How we got there)

- It took dedication and determination – Putting up Extra Hours.
- Once the goals had been set, work plans were drawn to enable realisation of the goals. It included activities, responsible persons and resources that would be required (see Appendix 8 for the typical RRI Project Plan.
- Stakeholders (ISK, KIP & RCMRD) were also involved to assist in helping the team move in a pro-client direction.
- The team made use of officers and students on attachment in areas of data capture – PS Lands paid students – see Appendix 11: Commendation Letters for Casuals / Student Attachment.
- Equipment was not enough -Team used its good relations to temporarily acquire some equipment and materials.
- Emphasize Team Spirit:
 - ✓ Compliment Individual & Team Work
 - ✓ TEAM=Together Each Achieve More!

Example: Dealing with the GLA Challenge

- Daily and WEEKLY EVALUATION Reports –see Appendix 12 (a-b) for Typical Individual Evaluation Report Forms
- The printing of the GLA Title Registers was given priority as some officers of the Government Printers worked overtime to ensure the Registers were delivered in time upon our insistence.
- Our team member actually followed the procurement process all the way to the Government Printer.
- Later employed skilled Casuals/Students on attachment to speed up the process.
- Procured 12 Title Registers from the Government Printers out of 50 required.
- Collection of information of missing folio's from Deed Files into the New Registers.

5.5.3 Lessons Learned

- RRI as a RBM tool can be used to achieve quick results where other attempts take too long or fail.
- The 100 days to accomplish immense tasks efficiently improved the way work is done in the Ministry by eliminating lethargy.
- Some actions required 'personal touch'
- It is important to have the planned equipment and personnel in order to achieve the desired results
- Out of the RRI we have now obtained statistical data on how much a person can capture per day for all the 5 RRIs - (see Appendix 10: Quantifying Methodology/ Lessons Learned.
- It is important to put a Change Management Programme at the Work Place.

6 Chapter 6 Design of a GIS-based National Land Information Management System (NLIMS)

6.1 Introduction to Proposed GIS-Based NLIMS

Except for the stand alone computerization projects already discussed in the previous Chapter 5 above, the Ministry has continued to use mainly manual Land Information Management System. The Ministry has however accumulated massive land information records dating back to over 100 years ago which have now increased to unmanageable proportions largely due to continued use of the outdated manual systems, thereby making service delivery both inefficient and ineffective. Due to the large data volumes and the technological demand for faster services, the manual system can no longer be relied upon – a more efficient system is necessary. Such a system is a Computer Based Information System (CBIS) on the Ministry's Land Records which operates on GIS Technology.

6.2 GIS Concepts

a) What is GIS?

Geographical Information System (GIS) is defined as an information system that is used to input, store, retrieve, manipulate, analyze and output geographically referenced data or geospatial data, in order to support decision making for planning and management of land use, natural resources, environment, transportation, urban facilities, and other administrative records.

b) The key components of GIS

The key components of GIS are computer systems, geospatial data and users, as shown in the figure below

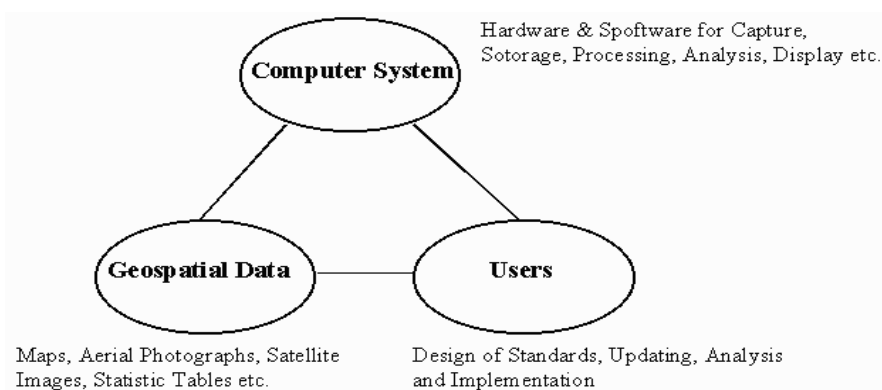


Diagram 6.2(1): The Key Components of GIS

A computer system consists of hardware, software and procedures designed to support capture, processing, analysis, modeling, display and sharing of geospatial data. The sources of geospatial data are digitized maps, aerial photographs, satellite images, statistical tables and other related documents.

The roles of the user are to select pertinent information, to set necessary standards, to design cost-efficient updating schemes, to analyze GIS outputs for relevant purpose and plan the implementation.

c) Categories of Geographic Information (GI)

The diagram below shows Categories of Geographic Information (GI)

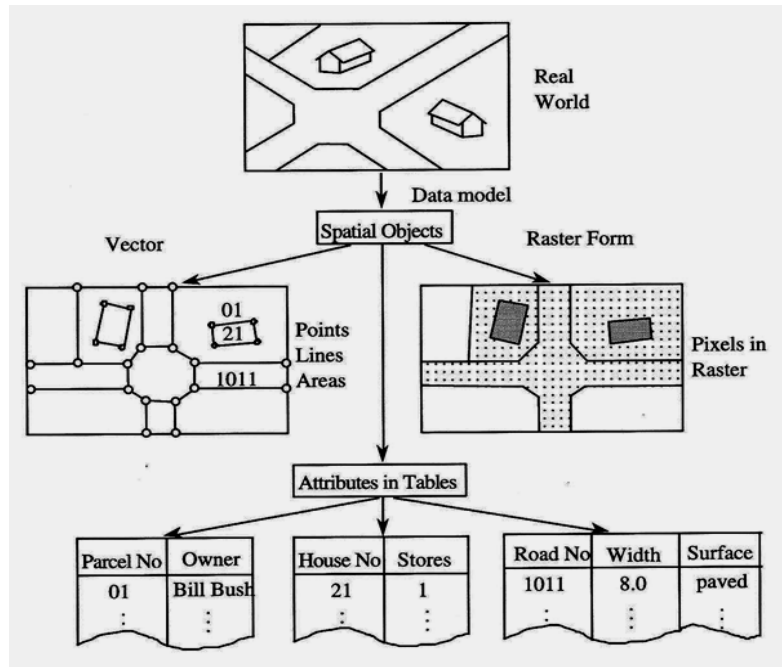


Diagram 6.2(2): Categories of Geographic Information (GI)

d) GIS benefits.

Research has shown that “At least 80% of public and private decision-making is based on some spatial or geographic aspects” - ISO Bulletin 2001. Thus any organization interested in activities distributed over some geographical area, can use the GIS technology.

Once a GIS is implemented, the following are some of the expected benefits: -

- geospatial data are better maintained in a standard format
- revision and updating are easier
- geospatial data and information are easier to search, analyze and represent
- more value added product
- geospatial data can be shared and exchanged freely
- productivity of the staff is improved and more efficient
- time and money are saved
- better decisions can be made

6.3 Application of GIS Technology in the Ministry of Lands

6.3.1 Uncoordinated Vs Coordinated Ministry's Land Records Data Sets

All the previous computerization initiatives in the Ministry are stand alone databases – neither coordinated or integrated databases - leading to un-sharable data sets and hence wastages of our scarce national resources due to duplication of efforts.

- ❑ **Uncoordinated Data sets leads to “Dead Data Bases”**
 - Unsharable data sets leading to wastages of scarce national resources
 - Duplication of Efforts
- ❑ **Coordinated Data sets leads to Standard Data Sets**
 - Sharable Land Data sets
 - Less Duplication of data
 - Open access to data
 - Easy to use and
 - Multipurpose

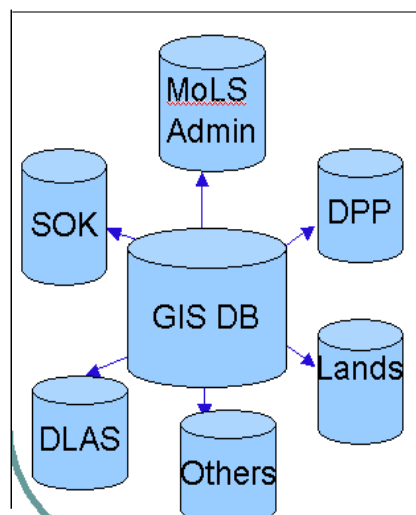


Diagram 6.3(1): Uncoordinated Vs Coordinated Land Records Data Sets

6.3.2 Land Registration Maps and Land Ownership Records

As seen from the foregoing, the Ministry of Lands has four technical Departments; two of which deal with land registration maps (Departments of Survey and Physical Planning) and the other two with land ownership data (Departments of Lands and Land Adjudication & Settlement).

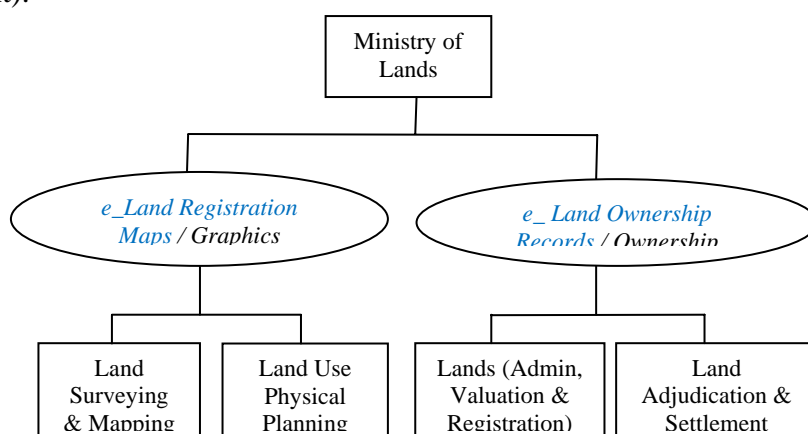


Diagram 6.3(2): e_Land Registration Maps and e-Land Ownership Records

The Task Force has proposed to have the land registration maps (*graphics*) and the land ownership data (*attributes*) to be in a **single integrated Land Database** modelled on the modern Geographical Information Systems (GIS). This will lead to a comprehensively integrated National Land Information Management System (NLIMS) which will incorporate *e-Land Records* and *e-Land Registration Maps* such that *land information can be accessed*

by the citizenry from anywhere, when they need it, where they need it and in the form they require it.

6.3.3 Integration of Land Registration Maps with Land Ownership Records

For appropriate and effective management of the Ministry's Land Records, integration of Land Registration Maps (from DOS & DPP) with all necessary attribute data (from CoL & DLAS) by GIS Technology using a GIS Mapping Software like the Arc GIS from ESRI. The starting point however is data capture of all the Land Records (i.e. Registration Maps and Titles data) in standard computer compatible formats. The primary linkage key is the land parcel's Land Reference Number.

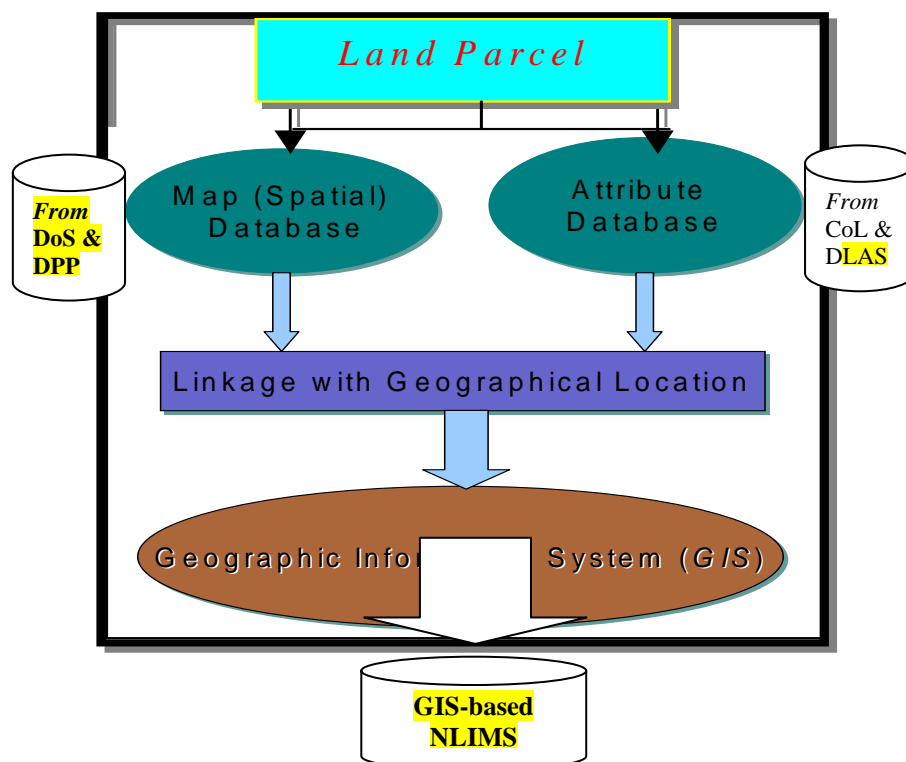


Diagram 6.3(3): Integration of Registration Maps and Ownership Records by GIS

6.4 GIS Database Design

6.4.1 Characteristics of a Good Database Design

Having looked at what a GIS-based NLIMS is, this section recommend on what the design of the database should address. The foundation of an effectively implemented GIS is a good database design, and what makes a database design good is asking the following questions;

- *How can GIS technology be implemented to streamline existing functions?*
- *What data is of most benefit to the Ministry?*
- *What data can be stored?*
- *Who is/should be responsible for database maintenance?*

A design provides a picture of where you are, where you are going and how to get there. It allows a holistic view of the database and how its different aspects interact.

6.4.2 Steps in Designing a Geodatabase

The database in focus is a *Geodatabase*. A geodatabase extends a database thus achieving the maintenance of graphic features and attributes in a true relational database management system such as SQL-Server database.

The design of a geo-database is achieved through the following four steps;

Step 1: Identifying Data required in GIS,

Step 2: Modelling of Users View,

Step 3: Selecting/Matching Geographic Data with Geodatabase Model

Step 4: Organising Geodatabase Structure.

Step 1: Identification of Ministry's Land Records Data Required in GIS

In chapter 3 we have seen a list of all data that should be captured. Below is an extraction, from the same list, of data required for GIS, which is hereby grouped into five categories based on type: -

- **Land Records** - Records related to land planning, surveying, registration and administration
- **Topographical**- These category consists of features on the surface of the earth
- **Altimetry**- These is data concerned with the shape of the earth
- **Geodetic** - Data concerned with coordination of features on the surface of the earth
- **Imagery** - Imagery includes aerial photographs satellite imagery, scanned parcel maps and all other scanned documents that relate to the parcel

LOGICAL DATA GROUP	Data Layers	
Land Parcel Records	Parcels	International Boundary
	Land Adjudication Progress Map	National Boundary
	Development Plans	Land Use
Topographic	Buildings	Structures
	Transport	Vegetation
	Centerline	Recreation
	Parkings	Fences
	Roads	Airfields
	Railway	Utilities
	Hydrography	Bridges/Overpasses
	Swamps/marshes	Digital Orthophotos
	Water Bodies	Satellite Imagery
Altimetry	DTM	Spot heights
	Contours	River Valley
Geodetic	Trigonometrical Stations	Boundary Pillars
	Benchmarks	
Imagery	Scanned Parcel Maps	Digital Orthophoto
	Scanned Parcel Reports	Satellite Imagery

Table 6.2(1): The Ministry's Land Records Data Required in GIS

Step 2: Modelling of users View

The above data groups enable the modelling of users' view of data, which as can be seen below is via attributes/characteristics of the land records such as Parcel Registration Number and place name.

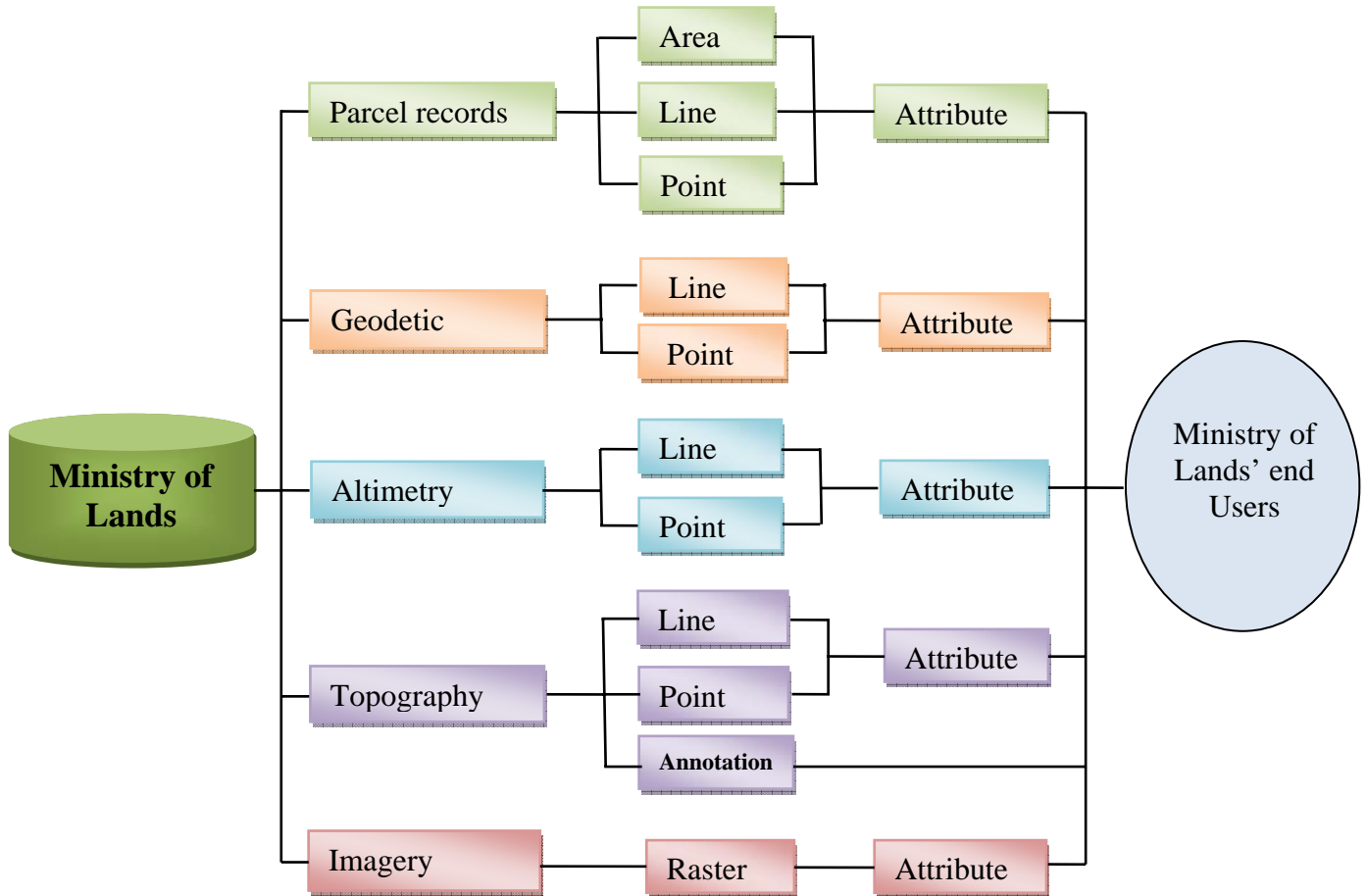


Diagram 6.2(4): Land Parcel Based NLIMS

Steps 3&4: Selecting/Matching Geographic Data with Geodatabase Model and Organising Geodatabase Structure

In these steps the data groups/classifications are looked into more closed, noting their spatial and feature type as well as how the data is to be organised in a geodatabase

Table 6.3(1): Organising Geodatabase Structure

LOGICAL DATA GROUP	TYPE OF RECORD	SPATIAL TYPE	FEATURE TYPE			
Parcel Records	Parcels	Area	Polygon Feature	Land Base Parcel Parcel Description Ownership Value Land Use Condition Section Way leave Easement Block Zone Boundary Buildings Buildings Description Transport Roads Railway Airfields Bridges Centreline Description Utility Utility Description Environment Vegetation Rivers W. bodies Recreation Fences Swamps Altimetry Contours Spot heights River valley DTM Geodetic Controls Benchmarks Pillars Imagery Image Description		
	Parcel Description	Text	Annotation feature			
	Owner Names	Text	Annotation			
	Valuation Reports	Text	Annotation			
	Land Use	Text	Annotation			
	Condition	Text	Annotation			
	Section	Area	Polygon Feature			
	Way leave	Area	Polygon Feature			
	Easement	Line	Line Feature			
	Block	Area	Polygon Feature			
	Zone	Area	Polygon Feature			
	Boundaries	Area	Polygon Feature			
	Topographic	Buildings	Area		Polygon Feature	
Building Description		Text	Annotation			
Roads		Line	Line feature			
Centerline		Line	Line feature			
Parkings		Area	Polygon Feature			
Railway		Line	Line feature			
Rivers		Line	Line feature			
Water bodies		Area	Polygon Feature			
Swamps/marshes		Area	Polygon Feature			
Vegetation		Area	Polygon Feature			
Recreation		Area	Polygon Feature			
Fences		Line	Line feature			
Airfields		Area	Polygon Feature			
Utilities		Line	Line feature			
Bridges/Overpasses		Area	Polygon Feature			
Altimetry	Contours	Line	Line feature			
	Spot heights	Point	Point Feature			
	River Valley	Surface	TIN			
	DTM	Image	Raster			
Geodetic	Control Points	Point	Point Feature			
	Benchmarks	Point	Point Feature			
	Boundary Pillars	Point	Point Feature			
Imagery	Digital Orthophotos	Image	Raster			
	Satellite Imagery	Image	Raster			
	Scanned Parcel Maps	Image	Raster			
	Scanned Parcel Reports	Image	Raster			

Geo-database

Feature Dataset
Polygon Feature Class
Annotation Feature Class
Annotation Feature Class
Annotation Feature Class
Annotation Feature Class
Annotation Feature Class
Annotation Feature Class
Polygon Feature Class
Line Feature Class
Polygon Feature Class
Line Feature Class
Polygon Feature Class

Feature Dataset
Polygon Feature Class
Annotation Feature Class

Feature Dataset
Line Feature Class
Line Feature Class
Polygon Feature Class
Polygon Feature Class
Line Feature Class
Annotation Feature Class

Feature Dataset
Line Feature Class
Annotation Feature Class

Feature Dataset
Polygon Feature Class
Line Feature Class
Polygon Feature Class
Polygon Feature Class
Line Feature Class
Polygon Feature Class

Feature Dataset
Line Feature Class
Point Feature Class
TIN
Rasters

Feature Dataset
Point Feature Class
Point Feature Class
Point Feature Class

Feature Dataset
Rasters
Annotation Feature Class

6.5 Computer and Data Network Systems

In order for the Ministry to develop a successful Computer Based Land Information system, the following components of computer systems must be adequately addressed;

a) Computers

In the recent years, the capacity of PC computers has improved substantially and as such the Ministry does need to worry about main or mini frame computers. Three types of computers will be of importance; Work stations, Servers and high performance PCs. The specifications of these machines must be clearly provided before any procurement

b) Computer Operation Systems

A Computer operating system is a set of programmes which starts, sustains and shuts down a computer. It is on this upon this platform that all application softwares operate. Today Microsoft operating systems have become the de-facto standard, enabling a high degree of compatibility among softwares and devices and as such the Ministry should purchase them.

c) Data Networks

There two types of networks that must be used at one time or the other; Local Area network (LAN) and Wide area Network (WAN).

LAN is a data communication system linking computers and devices usually within the same building. The Ministry has already installed a LAN at its Ardhi House Headquarters and efforts are in place to finale a LAN at the Survey Field Headquarter, Ruaraka. However, little has been done at the district offices and that must be addressed.

WAN is a data communication system linking two or more LANs. Even though the currently the Ministry does not have any WAN, it is a must that such a system be put in place to enable communication between the Ministry Headquarter, Survey Field Headquarters and the District Offices.

Without the communications systems in place a full implemented LIMS can not be realised. The use of LAN and WAN is a technological trend referred to as distributed computing.

d) Application Softwares

Three types of application softwares are of importance to the Ministry for it to achieve NLIMS. They include;

- i). GIS softwares – for spatial data management
- ii). Database Management Softwares – for tabular data management
- iii). Document Management Softwares – for management of documents in the day to day office activities
- iv). Management Information system (MIS)

e) Choice of an Application Software

The following are a set of the guiding principles in choosing application software for design and implementation of LIMS (Macleran, Sida Consultant):

- In-house vs. external, commercial development.
- Commercial software vs. Free & Open Source Software (FOSS).

- Commercial off the Shelf (COTS) vs. customised solution.
- Customised data model vs. international standards (STDM)
- Suppliers vs. Strategic Partner
- In-house vs. commercial support contract.
- Data management shared service centre vs. data management by individual departments.
- Centralised vs. decentralised solution (National Government Core Network).
- Federated vs. single enterprise solution.
- MoL managed LIMS vs. outsourced to service provider.
- Incremental vs. big bang implementation.
- NSDI loosely vs. tightly coupled.
- Replicated current business process vs. business change.
- Focus on internal requirements vs. outwards facing, citizen centric solution.

It is recommended that the Ministry installs enterprise software systems thus cutting down on cost of software licences but at the same time making data available to, if need be, everyone within the Ministry, but the option need to be explored further.

f) Computer Servers

Because of the size of the Ministry as well its different processes, it is recommended that a Master and working GIS database configuration be adopted. Under this setup departments/divisions will work with their respective data files located at their own “working” data server and copies periodically stored on a “master” server that is accessed by entire Ministry.

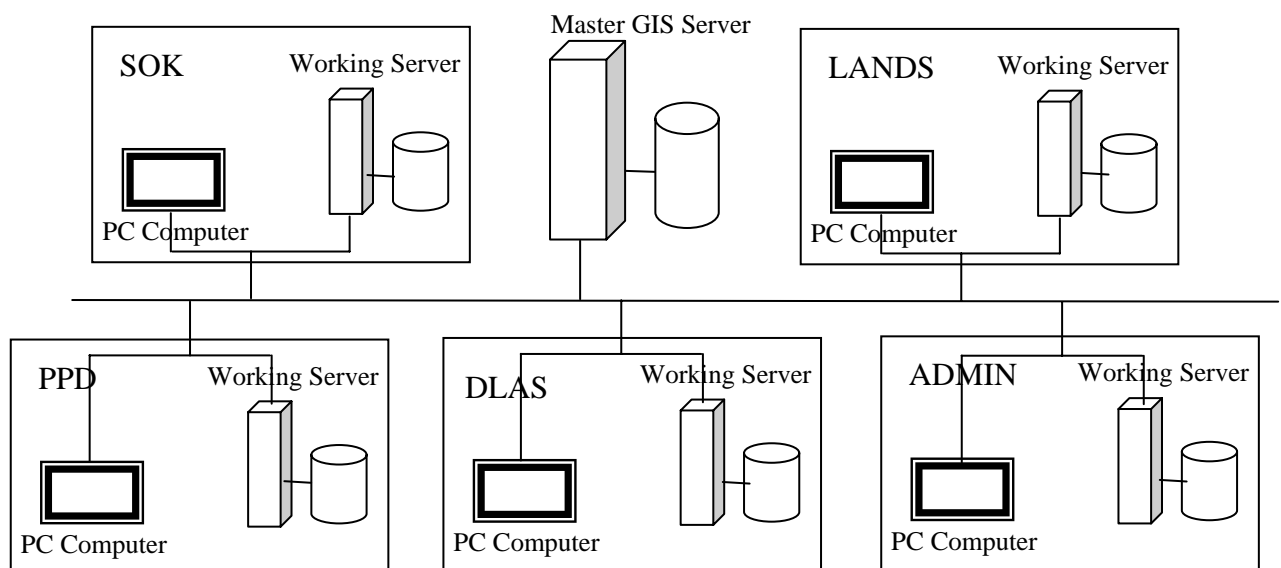


Diagram 6.4(1): Computer Servers

This configuration has three main advantages;

- Departments/Divisions will have physical control over the data they create whereas the master server upon which the entire Ministry relies is under the physical control of the ICT Unit.
- Heaviest GIS data users access their Departmental data over its LAN therefore making data transmission over main interdepartmental line lower.

iii). The data editing process is less complex since departments work with the data under their control.

To enable multiple editing of data the procured database system must be capable of versioning.

6.6 Systems Implementation: Some Expected Characteristics of Outputs

The overall objective of NLIMS is aimed at improved access and retrieval of Land Information to improve efficiency in service delivery and making land data available for multiple user categories.

6.6.1 Static Paper Maps versus Dynamic Digital Maps

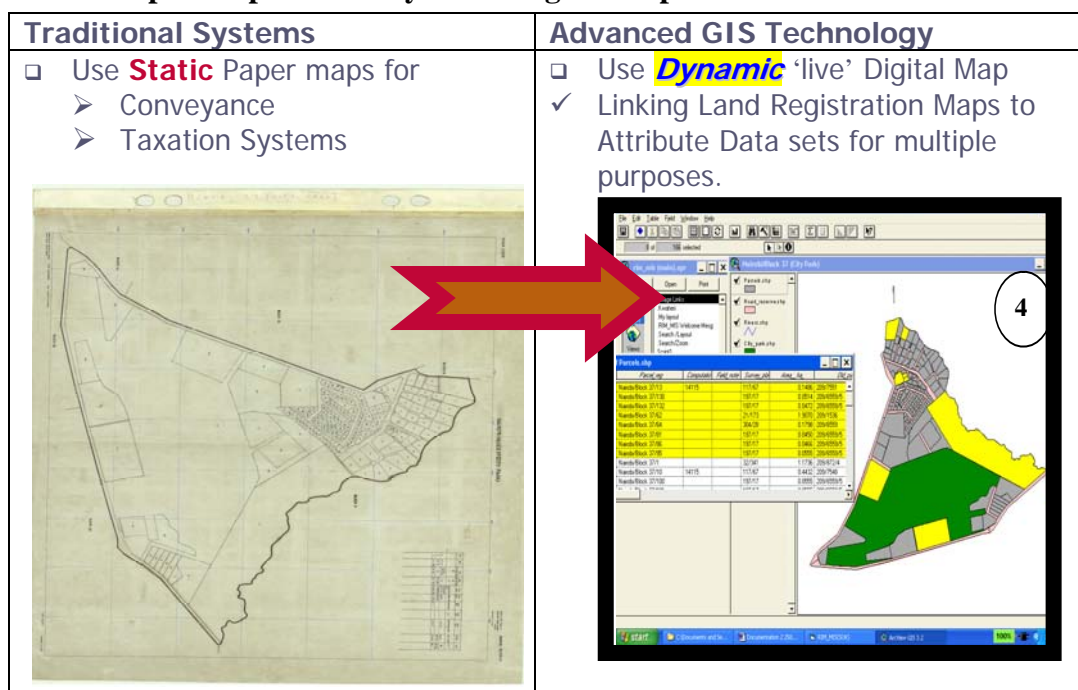


Diagram 6.6 (1): Static Paper Maps versus Dynamic Digital Maps

6.6.2 Some Examples of Expected Benefits of NLIMS

Example 1: Accessibility & Security of Land Data

No.	Current Manual System	New Computer-Based GIS System
1.	Map and attribute data are held separately in different locations, files and cabinets.	Map and attribute data are no longer held separately in different locations, files and cabinets but in one single database.
2.	This imposes restrictions on access, when searching for both sets of data.	This makes it easier to access and retrieve data when searching for both sets of data simultaneously.
3.	Retrieval of both spatial and attribute data is time-consuming. Time spent on accessing may be more than 50% of the time spent using the said maps.	Retrieval of both graphic and attribute data is almost simultaneous.
4.	This presents a massive cost in time and is certainly therefore, not a productive practice	Staff more productive. Saves time
5.	Susceptible to the risk of loss or damage;	With GIS, data is more secure and better organized. The

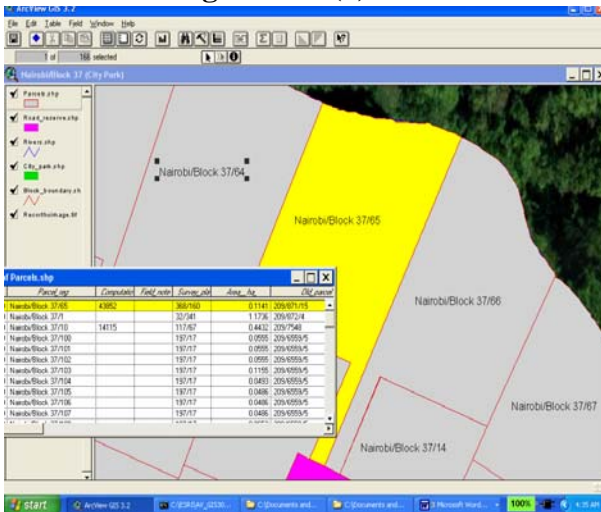
No.	Current Manual System	New Computer-Based GIS System
	they may become torn or misplaced and, as is often the case, only one original set of the RIM exists at a time.	GIS utilises a central computer database of all maps and attribute data. <i>Security passwords are issued to authorised staff only. Thus only authorised members of staff have access to the information for viewing and/or editing</i>
6.	There is no way of backing up the data without copying the entire map series. Preserving the confidentiality of data is therefore difficult as paper-based maps information can only be locked away.	Data is backed up on regular intervals and stored at different locations elsewhere, preferably on daily, weekly or monthly basis thus reducing hazards of, say fire
7.	Difficult to reconstruct records in case of calamities of say, Fires!!	In case of calamities like fires, Records are easily reconstructed with minimal loss of data.

Table 6.6 (1) Example 1: Accessibility & Security of Land Data

Example 2: Integration of Graphical and Attribute Land Data

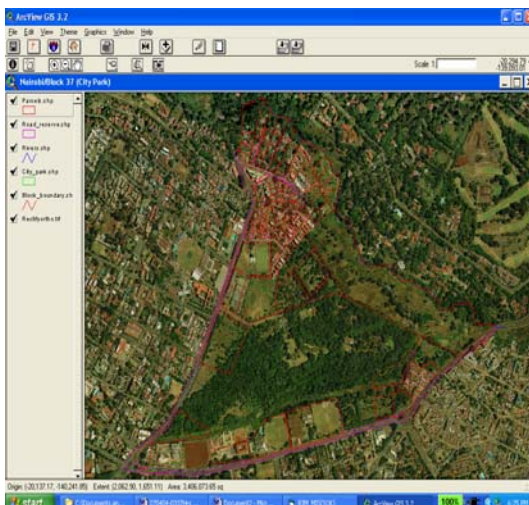
- ❑ Linkage of Features on a GIS map to the information in their attribute data table.
- ❑ Queries can easily be made on any layer.

Diagram 6.6 (2): Parcel Nairobi/Block 37/65 and all its attributes



- ❑ Features on a map are linked to the information in their attribute table.
- ❑ Thus, highlighting a feature brings all information stored about it and see corresponding feature on a map.
- ❑ The links between features and their attributes makes it possible to ask questions about the information in an attribute table and display the answer on the map and vice versa as shown in the figure.
- ❑ There is an almost limitless amount of information and data that could be stored, and retrieved, in the GIS-based Database.

Example 3: Integration of Data: Imagery Linkages

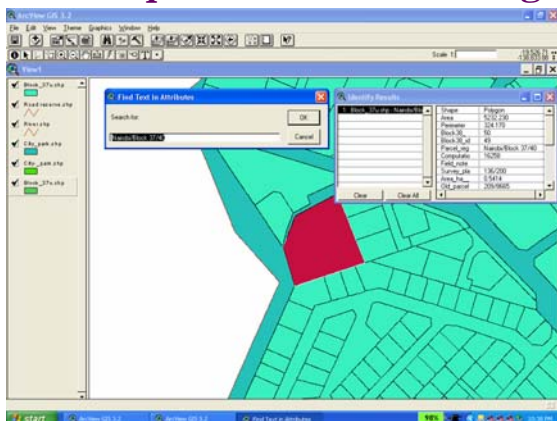


The integration of the aerial photograph puts the parcel maps into a real-world context and provides information on the ground developments at the time of aerial photography. This is another completely new capability of a GIS-based land information system.

For example, Figure shows the RIM_MIS Project area, the Nairobi/Block 37 (City Park), displaying the Block Boundary, the Parcels, the Road Reserves, and the River bordering the City Park over a colour aerial photograph that was taken in 2003

Diagram 6.6(3): Display of Imagery Links of RIM Nairobi/Block 37 (City Park), over Colour Aerial Photograph 2003

Example 4: Data Searching



- Linkage of Features on a GIS map to the information in their attribute table.
- The opposite diagram shows search results for parcel of Land (No. Nairobi/Block 37/ 40).

Diagram 6.6 (4): Searching Land Data

Example 5: Integration of a Picture e.g. a Scanned Survey Plan

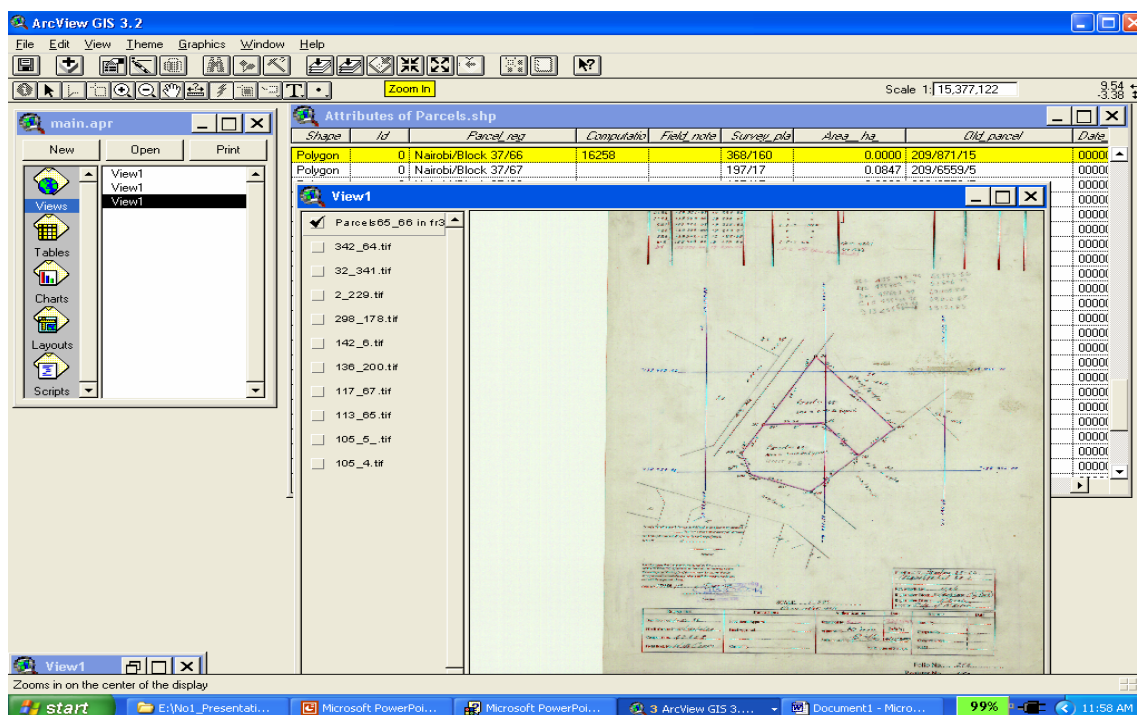


Diagram 6.6 (5): Integration of a Scanned Survey Plan in NLIMS

6.7 Web and SMS Services

Once we have established digital databases, then we can design, and implements some scalable *e-Land Ownership Records* and *e-Land Registration Maps* and offer some *SMS services to the citizenry*. We need to migrate, in phases, to web based applications in order to increase access to land information and services.

7 Chapter 7 Recommendations on the Way Forward and Conclusions

This chapter gives recommendation on how the challenges identified previously in chapters 1-6 above can be overcome in order to achieve an efficient NLIMS. It is presented in two parts; the common and specific recommendations per Department.

7.1 Common Key Findings & Recommendations across the Departments

7.1.1 Recommendations I: Processes and Procedures

The Task Force found out that the Ministry was burdened by an “inherited” culture, systems, structure, procedures and practices much of which were badly “outdated” and irrelevant. However, the Task Force found that the Ministry’s existing structure was not necessarily the major problem that hindered service delivery. The problem was that the various Departments within the Ministry were acting like independent silos instead of working together in a coordinated effort to achieve commonly held Ministerial goals and objectives.

The service will greatly be enhanced by reducing overall number of steps especially in Land Administration and Land Registration Divisions in the Department of Lands and at the Cadastral Division of the Department of Surveys where there is a lot of duplications and redundancy. Some of the steps, such as the 39 steps in preparation of titles can be reduced to say 10 steps, can be eliminated without compromising on quality. This may require re-organisation of the affected offices including knocking down some walls and modernising service counters similar to those at KRA offices.

The ultimate solution, however, is by the establishment of an integrated, transparent, decentralized, affordable and efficient GIS-based Land Information Management System at both the Ministry Headquarters and District offices across the country. The GIS-based NLIMS can be implemented in phases. Identify and implement LIMS in an urban area like part of City of Nairobi and peri-urban/rural area like Kiambu, Thika, Machakos or Kajiado.

7.1.2 Recommendations II: Safeguard the Paper Records

- a) Make a comprehensive inventory volumes and types of all land records; their physical condition and their storage facilities
- b) Verify authenticity of the land records data.
- c) Improve the records storage facilities: space, shelving and environment.
- d) Manage solution for incorrect and missing records
- e) Create a records conversion strategy.
- f) Reconstruct records where appropriate prior to scanning and digitising.
- g) Improve the records storage facilities: space, shelving and environment.
- h) Improve security for access to the land records especially the titling records at Department of Lands and the Land Registration Maps at the Department of Surveys.

7.1.3 Recommendations III : Scale – up the RRIs for Quick Wins

- a) RRI Goal 1 Finalise reconstruction and create database for GLA Volumes.
- b) RRI Goal 2 Share Valuation Database through LAN
- c) RRI Goal 3 Digitize /vectorize all the 430 Development Plans.

- d) RRI Goal 4 Finalise scanning of all survey plans and scale up by digitizing of parcel boundaries and scanning of survey reports.
- e) RRI Goal 5 Now that the Settlement Plot Files (FTS_SPF) is implemented, and then it will be replicated in all the other sister Departments in the Ministry.

In all cases above we need to enhance security/backups for the databases.

See RRI Scale up Implementation Programme and Budget – Appendix 5

7.1.4 Recommendations IV : Working in Shifts

The Ministry can introduce working in shifts on some special projects such as the RRI ones. In all the five RRIs, support will be required in providing more resources in terms of equipment, consultancy and compensations to officers who may from time to time have to go the extra-mile beyond normal working hours. Once adequate resources are availed, employ casuals to **Work in Shifts** 0800-1400 & 1400-2000 Daily; Work on Saturdays 0900-1600 (M,E &R for the week) and Pay Motivation Allowances to Casuals/Students/Staff Overtimes

7.1.5 Recommendations V: Human Resource Capacity Building

Technology is Dynamic: Although, the Ministry has skilled manpower, it needs to have the staff being up to date in modern technology, particularly the ICT. **Since technology is dynamic it** is recommended that the Ministry not only concentrates on investing in modern equipment but also on continuous training of staff on the application of new technology in all technical fields. In this respect there should be a proper training programme: -

- a) The executive (the PS, the Minister, Heads of departments and the top management)
- b) The technical staff at various levels
- c) The clerical officers (support staff, the operators)
- d) The Sensitization, Seminars and Workshops
- e) Organizations that interact with the ministry including the professionals and other stakeholders
- f) Technical tours

Change Management- to bring together those against and those who embrace the change

Team Work: To make better use of the available resources in terms of personnel, equipments and software's, there is need to embrace **team work policy**. This is where the management team can participate fully in terms of drafting a work plan and deciding on data is to be given preference.

7.1.6 Recommendations VI: Working Environment

The process of modernisation will need conducive IT working environment. The state of offices and the infrastructure in place most offices both at the headquarters and field stations is not conducive to IT development. For instance, the buildings in Ruaraka were put up in early 1950s and have become dilapidated. Generally, there is also increased pressure for office space and other facilities. In this respect, it is recommended that the Ministry invests in **modern offices** and furniture as a long term programme, meanwhile the existing offices can be renovated.

7.1.7 Recommendations VII: Technical Consultancy Assistance for NLIMS

Consultancy is required to carry out the following activities in liaison with the Ministerial Task Force on Automation of all Ministry's Land Records (MTF_AMLR) – *Appendix 6*.

NLIMS Consultancy Activities	
1. Carry out a Situational Analysis towards creation of an integrated National Land Information Management System (NLIMS) in future:	<ul style="list-style-type: none"> • User Requirements • Systems Requirements
2. Evaluation of all the On-going Computer -Based Information Systems (CBIS) Projects with a view of ensuring they can be integrated and linked to future NLIMS:	<ul style="list-style-type: none"> • Test the systems • Harmonize the Land Reference System within the whole Ministry
3. Prepare Methodological Data Capture, Data Structures, Plan & Scope: Methodology for the	<ul style="list-style-type: none"> • Reconstruct/Replacement of Old Tattered Land Records & • And Data Capture of all Ministry's Land Records
4. Overall Design & System Development of the Integrated NLIMS:	<ul style="list-style-type: none"> • Design Data Capture Modules for the NLIMS • Design Data Retrieval Modules for the NLIMS • Design Data Integration Modules for Graphics (maps) & Ownership Databases
5. Data Capture of All Land Records (Scanning, Digitization/ Vectorization) at Ministry Headquarters, Nairobi. Digitization and Automation of Processes for :-	<ul style="list-style-type: none"> • Cadastral Records (Land Survey Registration Maps & Documents) • Adjudication Records (Land Survey Registration Maps & Documents) • Mapping Records (Topographical Base Maps & Data) • Geodetic (Survey Control Networks) & Air Survey Records (Aerial Photographs) • Adjudication Records (Rights Ownership Data) • Settlement Land Documents (Ownership Data) • Land Administration Land Records (Ownership Data) • Valuation Records, Development of a Value Data Bank • Land Registration Records (Title Deeds & Titling Data) • Physical Development Plans
6. Data Capture & Automation of all Land Record Processes at District Offices	<ul style="list-style-type: none"> • At 10 Pilot Districts including Provincial HQs. • At all other Districts
7) Organize Capacity Building & Sensitization - Stakeholders	<ul style="list-style-type: none"> • Targeted Ministry Officers • Technical Tours • Hire and Train Personnel for Data Capture • Sensitization: Stakeholder workshops/meetings
8) Resources & Equipment: Advise on types of equipment for: -	<ul style="list-style-type: none"> • Data Capture • Data Processing • Data Manipulation & Analysis • Data Presentation including <i>e-Land Ownership Records, e-Land Registration Maps</i>; • Data Storage & Archiving • Installation and networking of the equipment
9) Networking	<ul style="list-style-type: none"> • Networking of Survey Field Hqs Offices at Ruaraka, Nairobi • Networking 10 Pilot District stations • Networking other District stations • Installation of Wide Area Network
10) Roll Out Full System / Publicity	

Table 7.1 (1): Required NLIMS Consultancy

The proposed draft plan for automation of all ministry land records is tabulated in Appendix 6.

7.1.8 Recommendations VIII: Web and SMS Services

Once we have established digital databases, then we can design, and implements some scalable services on *e-Land Ownership Records* and *e-Land Registration Maps and SMS*.

7.2 Specific Recommendations for Each Department

Department of Lands (DoL)

7.2.1 Administration Division

- a) Title Preparation
 - i. The documents should be redesigned for purposes of storage in digital format
 - ii. The process taken to prepare the titles should be reduced from about 39 stages to about ten (10)
- b) Issuance of Land rent clearance certificates and consents
 - i. The process should be shortened with a view of making it more efficient
 - ii. Enquiries on land rent dues should be provided via internet/SMS once databases are created. The land rent clearance certificate and consents applications should be made via Website.

7.2.2 Valuation Division

- a) A Computer monitoring system on all application for valuation to be established to eliminate duplication of instructions.
- b) The valuation procedure should be computerized. All the existing valuation reports should be scanned so that valuers can access all previous valuation reports from their offices via LAN.
- c) The writing of valuation reports is currently a tedious process. A system should be designed where the valuer will only be entering the variables and then a valuation report is generated and printed. This will leave the valuer to do only the calculations and analysis which can be done on a separate sheet and attached to the report.
- d) There is a need to upgrade the existing property value Database within the Division. Such a system should capture the following variables:-
(L.R. No., Plot Area, Locality, Estate, Road, House No., Development if any, Plinth areas (if property is developed), Declared value, Returned valuation, Condition of the property, Topography (level, sloppy, gentle etc), Soils (red, black cotton, mixed etc), Plot details (rectangular, irregular, etc), User e.g. residential, commercial, industrial)
- e) Searches
Once the necessary databases are in place, the Valuation Division should be linked with the Registration Division for ease of doing searches for valuation purposes.

f) Maps

Once the necessary databases are in place, the Valuation Division should be linked with the Department of Surveys for easy access to survey data for valuation purposes

The maps should be user friendly and in GIS format enabling query of location of properties of interest.

7.2.3 Land Registration Division

a) The A-Book should be automated so that all officers make immediate notes upon dealing with a document at all stages. A customised DMS system should be developed. Meanwhile, in the short term a file tracking system should be established in the Registry .the above systems should be web site interactive.

b) **Recommendations concerning Searches.**

- i. A File Tracking System should be put in place. This should reduce instances of missing files and speed up the time for processing of official searches.
- ii. Search forms should be availed online – on the Website
- iii. Reduce the process of copying by enabling the Registrar to have a scanned copy of the File; and upon verifying may print and certify the search.
- iv. Recopying of the tattered and torn G.L.A Titles (Volumes)
- v. G.L.A. searches to be modified from volumes by conversion to another system of Registration either R.L.A. or R.T.A.
 - This can be done gradually and on the initiative of the Registrars
 - The documents presented for transactions under G.L.A. for example conveyances and indentures can be converted upon presentation to R.T.A. System.
- vi. Provide for a programme that enables the Registrar to view the Land variables online (land area, value, rent)
- vii. Sensitize customers to download applications forms online
- viii. In the long term application should be made online

Department of Surveys (DOS)

7.2.4 Cadastral Division

It is recommended that a Computer based Cadastral Information System be fully established as an integral part of the wider NLIMS. The system should be an integration of;

- i. Document Management System
- ii. Geographical Information System (GIS) and a
- iii. Database Management System

7.2.5 Adjudication Division

It is recommended that;

- a) A Computer based Adjudication Survey Information System be fully established as an integral part of the wider NLIMS. The system should be an integration of;
 - i. Document Management System
 - ii. Geographic Information System and a
 - iii. Database Management System
- b) Only rectified aerial photo enlargements should be used in the adjudication process and the existing P.I.Ds georeferenced
- c) Land owners encouraged to apply for fixing of their property boundaries so as to minimise the expensive boundary disputes.

7.2.6 Geodetic & Geographical Information Systems (G&GIS) Division

- a) Real time data service GPS control points should be established
- b) Capacity should be built on provision of Magnetic declination data
- c) Capacity should be built on provision of Geoidal modulation data
- d) A common coordinate system should be agreed on and all digital data converted to the new system.
- e) All analogue data should be digitized to create a National Digital Topographical Database (NDTDB).

7.2.7 Mapping Division

- a) It is recommended that all activities in the division be done by use of a Geographic Information System which is an integral part of the wider NLIMS.
- b) A culture of acquiring new aerial photography and satellite imagery should be developed so as to ensure that all maps are up to date.
- c) All analogue topographical details should be digitized

7.2.8 Records Management at the Department

The Department's land records need to be managed professionally. E.g. all survey records are recommended to be accessed from one office. The office can have specialized units for various types of records. This is the office which will be charged with the responsibility of converting analogue data to raster data. It will also catalogue the scanned data and sent to a central data base.

When the current **Survey Act** was enacted, it assumed data handling methods that have now been overtaken by advances in technology. It is recommended that the current Survey Act be amended to accommodate modern technology and protection of copyright interest.

Department of Land Adjudication and Settlement (DLAS)

7.2.9 Adjudication Division

- a) A Document Management System should be put in place to manage adjudication processes
- b) Scan all original RIMs and PIDs
- c) All analogue data to be digitized
- d) Once the necessary databases are in place, the Department should be linked with the Department of Surveys for easy access to survey data for adjudication and settlement purposes

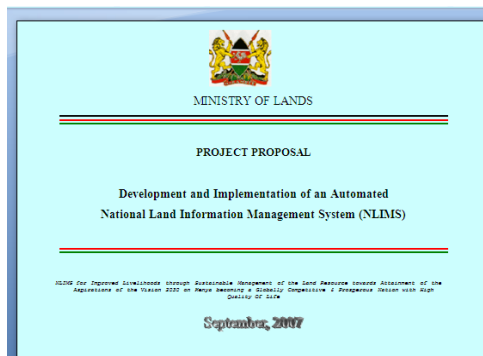
7.2.10 Settlement Division

- a) Up-scale the SFT billing system to be website interactive
- b) A Document Management System should be put in place to manage settlement processes
- c) Scan all original RIMs and PIDs
- d) All analogue data to be digitized
- e) Once the necessary databases are in place, the Department should be linked with the Department of Surveys for easy access to survey data for adjudication and settlement purposes

7.2.11 Department of Physical Planning (DPP)

- a) It is recommended that planning processes be automated. This calls for acquisition of the requisite hardware and software, design of appropriate interlinked and integrative system and capacity building.
- b) Once the necessary databases are in place, the Department should be linked with the Department of Surveys for easy access to survey data for planning purposes

7.3 CONCLUSIONS: Sustainability Project Proposal



We have made a project proposal entitled” *Development and Implementation of an Automated National Land Information Management System (NLIMS)*” – See Appendix 7a - to be rolled out in Phases of 100 days under RBM/RRI for users to reap benefits as soon as practicable. NLIMS aims at improved access, retrieval and processing of Land Information to improve efficiency in service delivery and making land data available for multiple user categories e.g.

conveyance, valuation, taxation and planning.

NLIMS will ultimately lead us towards the establishment of an intelligent, integrated approach to management of Land Records i.e. single Database of Title, Land Survey, Planning and Adjudication Land Records for the entire country that is accessible online.

E_LandRecords

Vision

Our envisaged NLIMS Vision is to ensure that high quality Land Information is easily accessible by the Kenyan citizenry from anywhere, when they need it, where they need it and in a form they require it.

Mission

Our envisaged NLIMS Mission is to Ensure the Land Registration maps and the Land Ownership Data to be in a single integrated Land Database modelled on the modern Geographical Information Systems (GIS) leading to an integrated National **Land Information Management System (NLIMS)** which will incorporate *e-Land Ownership Records* and *e-Land Registration Maps* to provide our clients and customers with high quality and needs-oriented land information products and services on a timely basis.

The vision and mission will ultimately lead to a New Paradigm Shift in the way the Ministry of Lands conducts its business; a typical example is as depicted in Appendix 7b - New Ministry’s Paradigm Shift

8 Chapter 8 Appendices

- 8.1 Appendix 1: The Task Force Members – Short CVs**
- 8.2 Appendix 8.2(a-b): Letters of Appointments:**
 - (a): Ministerial Task Force on Automation of all Ministry’s Land Records
 - (b): Ministerial Technical Working Group: Land Reform Transformation Unit Land Information Management Systems (LRTU_LIMS)
- 8.3 Appendix 3(a-b): Letters by the Cabinet Office on Computerization**
 - (a): Letters by the Cabinet Office on Digitization of Land Registries & Maps
 - (b): Letters by the Standing Cabinet Committee on e_Government
- 8.4 Appendix 4: Kenya National Dialogue and Reconciliation**
- 8.5 Appendix 5: RRIs Scale up Implementation Programme**
- 8.6 Appendix 6: Technical Consultancy Assistance on NLIMS**
- 8.7 Appendix 7(a-b): NLIMS Project Proposal & New Ministry’s Paradigm Shift**
- 8.8 Appendix 8: Typical RRI Project Work Plan**
- 8.9 Appendix 9: Overall Summary of Results for the five (5) RRI Goals**
- 8.10 Appendix 9: Quantifying Methodology/ Lessons Learned in Achieving RRI Goals**
- 8.11 Appendix 10: Atypical Commendation Letter for Casuals / Student Attachment**
- 8.12 Appendix 11 (a-b): Typical Individual Evaluation Report Forms**
- 8.13 Appendix 12: LIMS Programme (under LRTU) for Next 2 Years Version 1.0 20th May 2008**