

# Land Administration System Eswatini

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# Agenda

Introduction

Current Data Collection SLAM project

Future Land Administration System

> *feedback*



# Introduction

- › Sustainable Land Administration & Management Project
- › Pilot phase – October 2016 – May 2019
- › European Union funding of Euro 1.8 million?

# Introduction

## › **Project result areas (terms of reference)**

1. Tools are developed and used for more efficient Land Administration of Swazi Nation Land.
2. Relevant stakeholders capacitated to use the cadastre and manage Swazi Nation Land more efficiently and sustainably.
3. Institutional arrangements for non-Title Deed Land / SNL are reviewed and stakeholders accept the recommended revised arrangements.

# Introduction

## › **Project outputs (terms of reference)**

1. Tools are developed and used for efficient administration of SNL.
  - a) Maps of chieftdom landholdings and land use
  - b) Documented landholding recording tools
  - c) Computer-based land records system**
  - d) Documented Alternative Dispute Resolution Tools

# Introduction

## > **Computer-based land records system**

- a) System not specified in terms of reference.
- b) TA proposed to support design, procurement, and installation by the project.
- c) Project procured hardware and some software.
- d) Computer tools developed by the TA team.

# SLAM Data Collection



# SLAM Data Collection



Chiefdom  
Landholding  
Register



Chiefdom



Laptop

Provide changes to land information

Provide final result



Desktop GIS

QC Editor



# Data Collection Form

- > Interview
  - > Design
  - > MS Word

LANDHOLDING & LAND USE DATA FORM	
Version F (13 August 2018)	(LUR Data Form (F).docx)
<b>A. INTERVIEW INFORMATION</b>	
1. Enumerator	Select name from <a href="#">list (13 entries)</a> , or specify other & type name.
2. Date of interview	default: today.
3. Landholding unit number	Project ID number for homestead unit, which is created by the enumerator, for example as a personal sequence number for interviews performed. E.g. Johnson * 2018/02/13 * 1
<b>B. HOMESTEAD LOCATION</b>	
1. Region	Selected from list by enumerator.
2. Inkhundla	Selected from list within selected region.
3. Population census enumeration area nr.	Can be found on the homestead house e.g. 112411040-007-001.
4. Homestead location coordinate (select a point on <a href="#">map</a> )	Select homestead house on an orthophoto stored on mobile device in mbtiles format.
<b>C. RESPONDENT</b>	
1. Person interviewed <ul style="list-style-type: none"> <li>a. Family name</li> <li>b. Given name</li> <li>c. Other names</li> </ul>	Given name as in the passport (or official documents), other names may be used if alternative names.
2. Id Number	Personal Identification Number.
3. Birthdate	Only required if Id Number would not be available.
4. Gender	Select: <b>Male</b> , <b>Female</b> .
5. Contact information	Means of communication to respondent phone number.

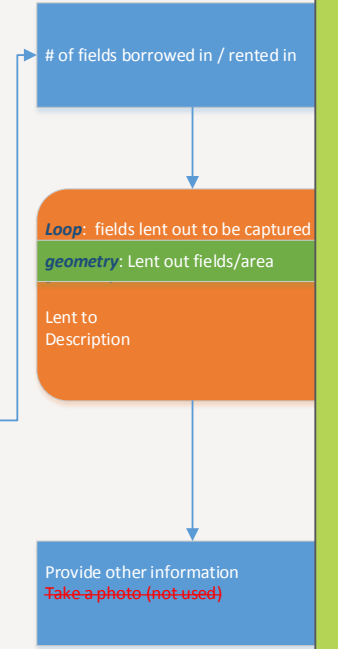
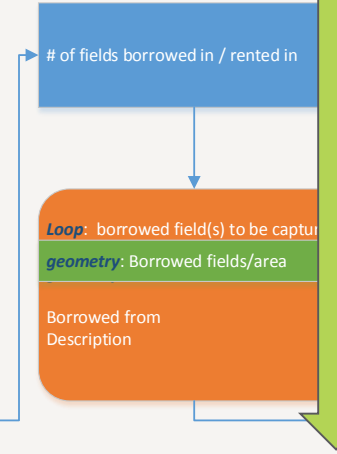
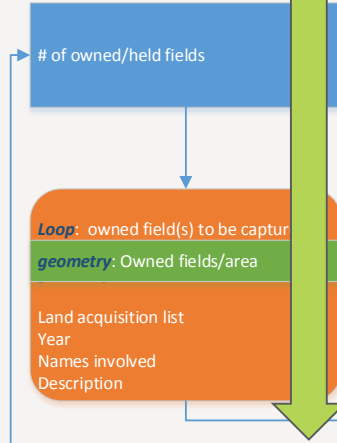
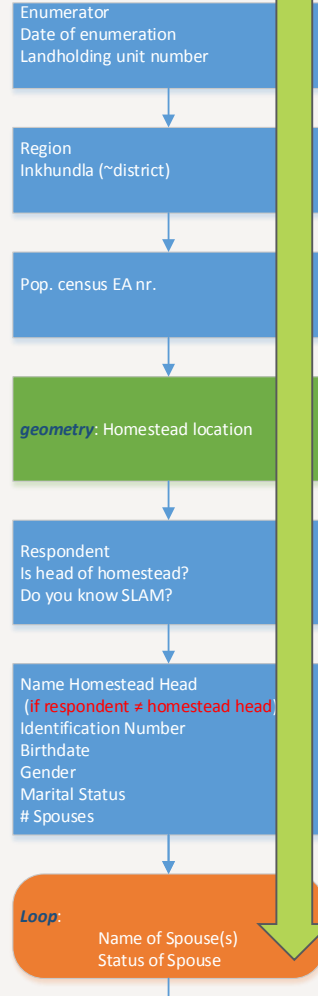
<b>D. HOMESTEAD HOLDER</b> (person who is recognised as head of the homestead)	
1. Homestead head <ul style="list-style-type: none"> <li>a. Family name</li> <li>b. Given name</li> <li>c. Other names</li> </ul>	Given name as in the passport (or official documents), other names may be used for alternative names. (copied from respondent if same as homestead head).
2. Id Number	Personal Identification Number (copied from respondent if homestead head).
3. Birthdate	Only required if Id Number would not be available.
4. Gender	Select: <b>Male</b> , <b>Female</b> .
<a href="#">Is Homestead head deceased?</a>	The deceased homestead head will be entered (if a new head has not been assigned), set this attribute to 'No'.
5. Marital status	Select: <b>Married / Multiple / Single / Widowed / Divorced</b> (if multiple spouses select Multiple).
6. Amount of spouses of homestead head <ul style="list-style-type: none"> <li>a. Spouse name</li> <li>b. Spouse status</li> </ul>	After indicating the amount of <b>current and former</b> spouses, this amount of spouse name(s) can be entered (in a programmatic loop). Select spouse status, default <b>Married</b> , or else <b>Deceased</b> or <b>Divorced</b> .
<b>E. HOMESTEAD LANDHOLDING</b>	
1. Land held by or allocated to the homestead. <ul style="list-style-type: none"> <li>a. On the <a href="#">map</a>, digitise the geometry of land parcels or field(s) held or 'owned'.</li> <li>b. Description of land</li> <li>c. <a href="#">Land use</a></li> </ul>	The total land area (that may be multiple fields) that the homestead was allocated and perceive as being 'owned'. After indicating the amount of land, held in one or more separate parts, 'parcels' or fields, the geometry of each part is entered with help of the orthophotomap (in a programmatic loop). If needed, a description of the land area (e.g. number of field strips) can be added. <a href="#">Land Use select</a> <b>Grazing, Arable/farming, Commercial, Residential, Forest, Wetland, Community</b> .

<b>F. DISPUTES</b>	
1. Is the landholding situated in an area with a chiefdom dispute or overlapping chiefdoms?	Select: <b>Yes</b> , <b>No</b>
2. Is the landholding subject to any current land disputes (not chieftaincy disputes)?	Select: <b>Yes</b> , <b>No</b>
a. If "Yes", is the dispute related to:	Select: <b>inheritance / family matter / umphakatsi / other (specify)</b>
b. Year when dispute first arose	Between 1900 and 2025
c. What is the status of the dispute?	Select: <b>nothing happening / being resolved</b>
1. If being resolved, how?	Select: <b>by family / by umphakatsi / by others (specify)</b>

# Interview

## > Guided

- > Workflow
- > Process



Provide other information  
~~Take a photo (not used)~~

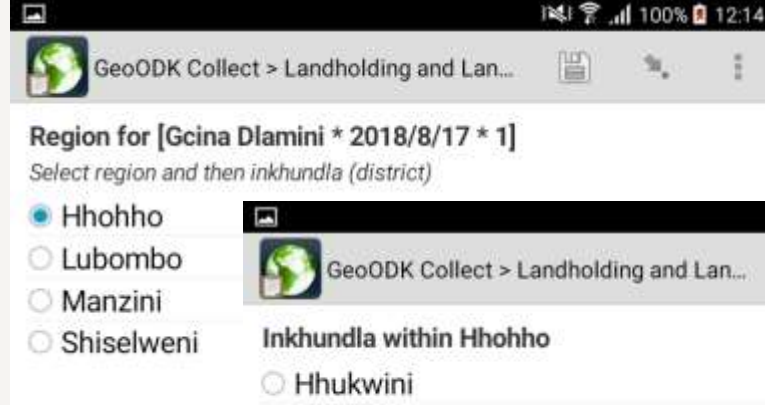
# Android App

- > Spatial data
  - > homestead location
  - > land holdings
  - > land borrowed in/out



# Android App

- > Interview
  - > Automated
- > Open Source Data Collection
  - > ODK Collect
  - > GeoODK Collect
  - > Open Source



GeoODK Collect > Landholding and Lan...

Region for [Gcina Dlamini \* 2018/8/17 \* 1]  
Select region and then inkhundla (district)

- ☒ Hhohho
- ☐ Lubombo
- ☐ Manzini
- ☐ Shiselweni



GeoODK Collect > Landholding and Lan...

Inkhundla within Hhohho

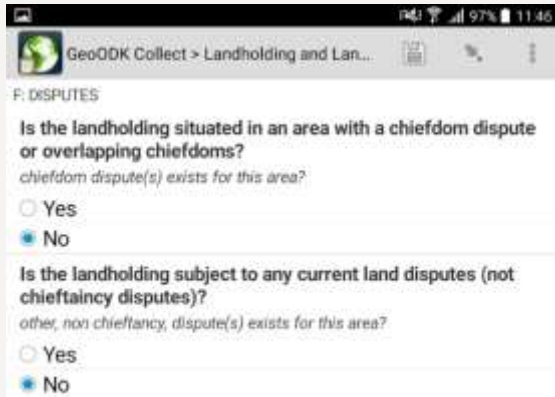
- ☐ Hhukwini
- ☐ Lobamba
- ☐ Madlangampisi
- ☐ Maphalaleni
- ☐ Mayiwane
- ☐ Mbabane East
- ☐ Mbabane West
- ☐ Mhlangatane
- ☐ Motjane
- ☒ Ndzingeni
- ☐ Nkhamba
- ☐ Ntfonjeni
- ☐ Piggs Peak
- ☐ Timphisini



GeoODK Collect > Landholding and Lan...

**In what umphakatsi is the homestead land currently situated?**  
*Which chief / chiefdom does the respondent recognise as the entity governing the homestead landholding? Provide name of chiefdom or the answer given by respondent. (inkhundla: Ndzingeni)*

- ☐ Bulandzeni
- ☐ Kwaliwini
- ☐ Ludlawini
- ☐ Mgungundlovu
- ☐ Mvuma
- ☐ Ndzingeni
- ☐ Nkamanzi
- ☐ Other



GeoODK Collect > Landholding and Lan...

F: DISPUTES

Is the landholding situated in an area with a chiefdom dispute or overlapping chiefdoms?  
*chiefdom dispute(s) exists for this area?*

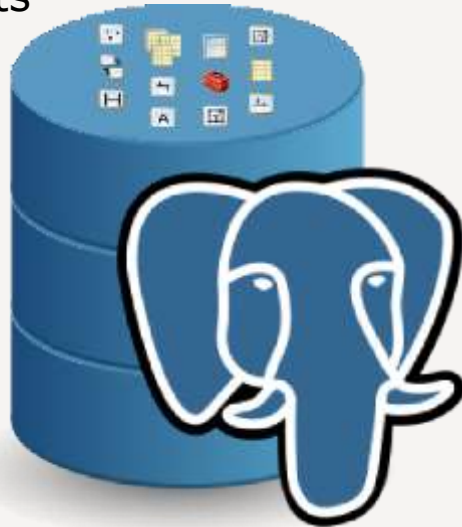
- ☐ Yes
- ☒ No

Is the landholding subject to any current land disputes (not chieftaincy disputes)?  
*other, non chieftaincy, dispute(s) exists for this area?*

- ☐ Yes
- ☒ No

# Central Database

- > Open Source Database
  - > PostgreSQL
- > 4 core datasets



## Homestead

Homestead Head  
Spouses  
Chiefdom

## Land holding

When acquired  
By whom?

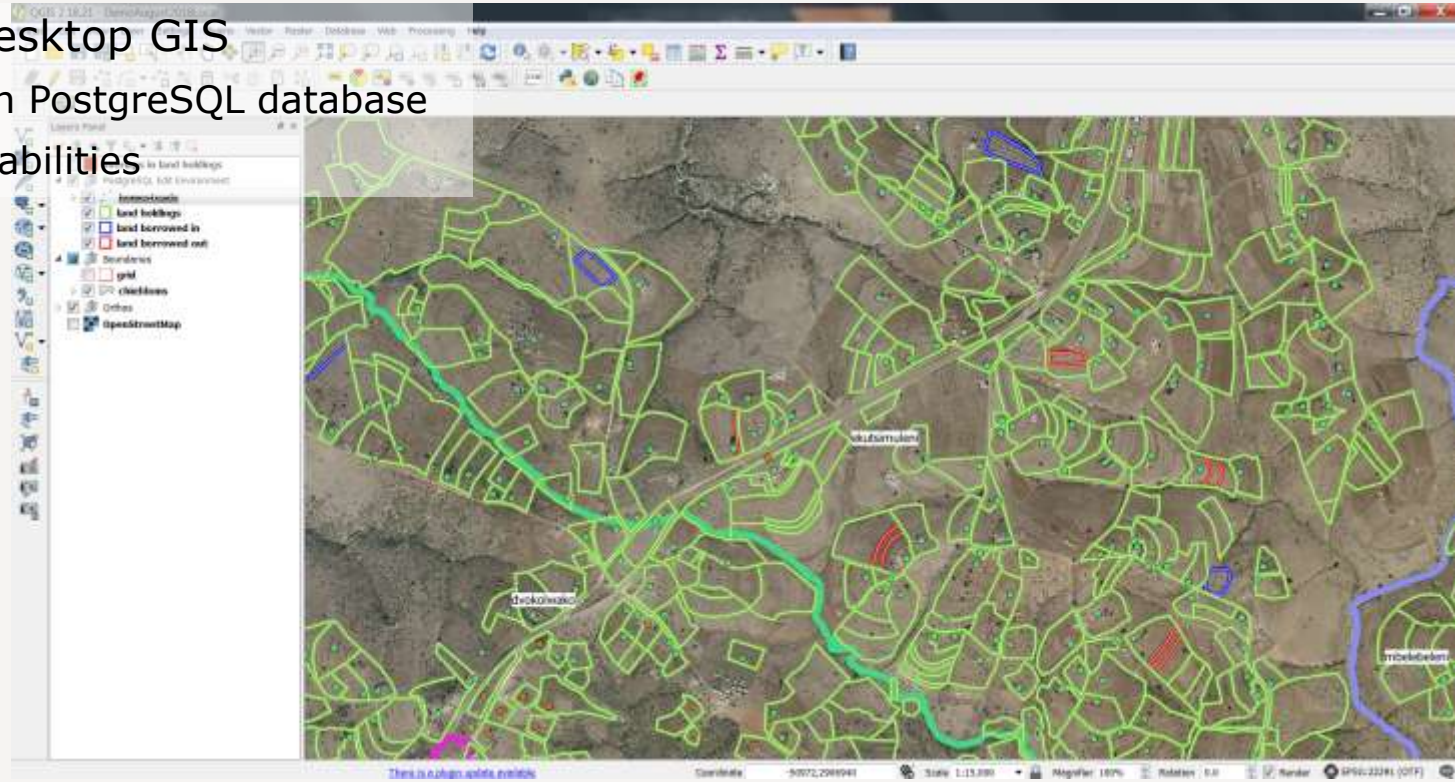
Land  
borrowed in  
From whom?

Land  
borrowed out  
To whom?



# Desktop QGIS

- Open Source Desktop GIS
  - Editing data in PostgreSQL database
  - Extended capabilities
- Demo



# Progress Reports

- > Statistics on central database
  - > amounts of homesteads collected
  - > averages & percentage of total

id	sub	title	unit	unit_amount
1		Homesteads		
1 a		Homesteads collected (edit environment)	total	3467
1 c		Homesteads average amount land holdings	average	1.4
1 d		Homesteads borrowing or renting in land	%	3.8
1 e		Homesteads lending or renting out land	%	3.5
2		Homestead fields		
2 a		Homestead landholdings collected	total	4770
2 b		Homesteads landholdings collected area	km2	103

# Slam awareness & Gender Homestead Head

id	sub	title	unit	unit_amount
3		SLAM		
3	a	Communications effectiveness (% respondents aware of SLAM?)	% yes	46.6
3	b	Communications effectiveness (how aware of SLAM?)	% community_meeting	30.5
3	b	Communications effectiveness (how aware of SLAM?)	% community_member	8.6
3	b	Communications effectiveness (how aware of SLAM?)	% family_member	5
3	b	Communications effectiveness (how aware of SLAM?)	% brochure	1.7
3	b	Communications effectiveness (how aware of SLAM?)	% other	0.7
4		Gender		
4	a	Gender Homestead Head	% male	70
4	b	Gender & Marital Status Homestead Head	% male, married	53.9
4	b	Gender & Marital Status Homestead Head	% female, widowed	20.9
4	b	Gender & Marital Status Homestead Head	% male, single	7.9
4	b	Gender & Marital Status Homestead Head	% male, widowed	6.3
4	b	Gender & Marital Status Homestead Head	% female, married	4.3
4	b	Gender & Marital Status Homestead Head	% female, single	3.7
4	b	Gender & Marital Status Homestead Head	% male, divorced	1.2
4	b	Gender & Marital Status Homestead Head	% female, divorced	1
4	b	Gender & Marital Status Homestead Head	% male, multiple	0.7
4	b	Gender & Marital Status Homestead Head	% female, multiple	0.2



# Disputes

id	sub	title	unit	unit_amount
5		Disputes		
5	a	Homesteads with chiefdom disputes	total	273
5	b	Homesteads with other disputes	total	143
5	c	Homestead Disputes	% Homestead without disputes	89.4
5	c	Homestead Disputes	% Homestead with chiefdom disputes	6.4
5	c	Homestead Disputes	% Homestead with disputes (not chiefdom)	2.7
5	c	Homestead Disputes	% Homestead with chiefdom & other disputes	1.4
5	d	Homestead with disputes (not chiefdom)	% other_homestead	39.2
5	d	Homestead with disputes (not chiefdom)	% family	18.2
5	d	Homestead with disputes (not chiefdom)	% umphakatsi	7
5	d	Homestead with disputes (not chiefdom)	% other	0.7

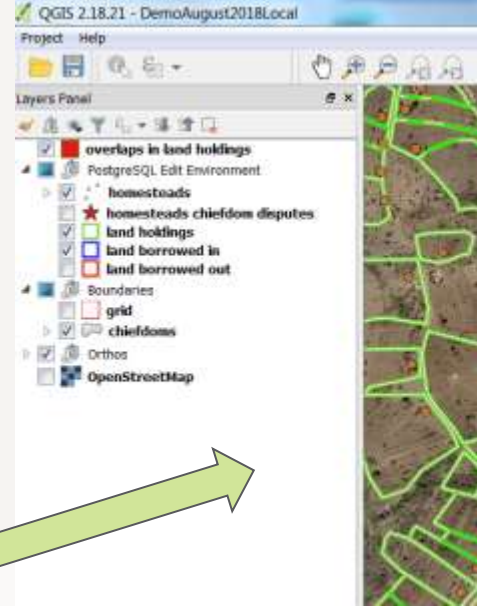
# Chieftdom

## > Laptop

- > Lists
- > Spatial Data
- > FileGeoDataBase
- > QGIS (simple version)

## > Chieftdom Landholding Register

- > changes



Subsistence Land Administration Management Project

Ministerial

List of Homestead Data Collected

Household number	Name of Homestead head	Gender	Age	ID Number	Spouse name	Spouse gender	Spouse age	Additional info
100	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
101	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
102	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
103	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
104	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
105	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
106	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
107	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
108	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
109	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
110	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
111	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
112	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
113	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
114	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
115	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
116	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
117	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
118	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
119	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
120	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
121	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
122	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
123	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
124	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
125	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
126	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
127	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
128	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
129	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
130	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
131	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
132	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
133	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
134	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
135	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
136	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
137	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
138	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
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142	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
143	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
144	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
145	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
146	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
147	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
148	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
149	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1
150	Thabane	Male	45	1111111111111	Thabane Thabane (female)	Female	45	1

# Chieftdom Landholding Register

- > Homestead
  - > changes
  - > new allocations
- > Maintenance
  - > SG's department



## CHIEFTDOM LANDHOLDING REGISTER

Region: .....  
 Inkhundla: .....  
 Chieftdom: .....

Homestead landholding number:	Date of allocation:	Area (Ha):	Land use:	Date:
Number of separate parcels:				
Name of homestead head:	Gender:	ID no.:	Date:	
Name of homestead head's spouse:				
Notes (additional information - e.g. household allocations):			Date:	
Land lent out to (name / terms & conditions):			Date:	
Land borrowed from (name / terms & conditions):			Date:	

(Land use codes: Res = residential, Ag = agricultural, Com = commercial, Ind = industrial, For = forest, Gra = grazing, Oth = other, Mixed use = (code) / (code))





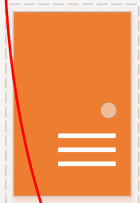
# Future Land Administration System



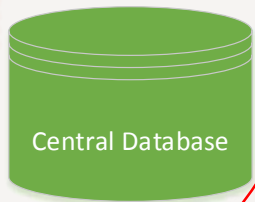
IT Datacenter



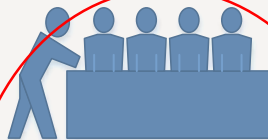
Web Application



Server



Central Database



Surveyor General's Department



Desktop GIS

QC Editor



Other Institutions



Public



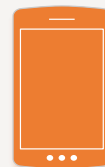
Chiefdom



Laptop



Chiefdom  
Landholding  
Register



Mobile Device



Enumerator

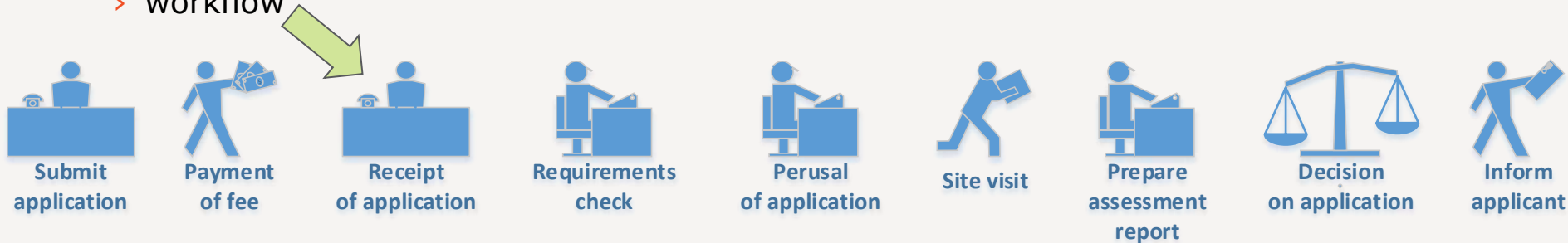


Collected  
Homestead Forms

## Entities Involved

# Web Application

- > Information via Internet
  - > Alphanumerical & Spatial Data
  - > Central
- > Start changes and applications
  - > on-line access (via Web Application)
  - > workflow





# Examples Web based systems



# Rwanda Land Information System (Web)

REPUBLIC OF RWANDA  
RWANDA NATURAL RESOURCES AUTHORITY

Province: Kigali City District: GASABO Sector: Kinyinya Cell: Karamu UPI: 1/02/10/03/2258

Parcel Search: 1/02/10/03/2258

Province: Kigali City District: GASABO Sector: Kinyinya Cell: Karamu UPI: 1/02/10/03/2258

Share Numerator: 1 Share Denominator: 1 Is Representative: Yes No

Representative Address: Representative: NTAKIRUTIMANA FAUSTIN Province: Kigali City District: GASABO Sector: Kinyinya Cell: Gacururo Village: Akarambo

Displaying Real Right: Name: NTAKIRUTIMANA FAUSTIN Share Numerator: 1 Share Denominator: 1 Is Representative: Yes No Representative Address: Representative: NTAKIRUTIMANA FAUSTIN Province: Kigali City District: GASABO Sector: Kinyinya Cell: Gacururo Village: Akarambo

17 Gihaka Gutura - Ubutaka bwite bw' Akarere

Yes No Split Merged

102100322581426748430058 102100322581426748430058 102100322581426748430058

Active Provisional

Scale 1:822

# Kenya Mining Cadastre

## > Users - online requests



REPUBLIC OF KENYA

# Ministry of Petroleum and Mining

## State Department for Mining

### Mining Cadastre Portal



MADINI KENYA

#### Mining Cadastre

- Home
- Mining Cadastre Map
- Sign In

#### External Links

- Madini Facebook
- Madini Twitter
- Share on Social Media

#### Legal

- Contacts
- Terms of Use
- Privacy Policy

#### Registration to use the Online Mining Cadastre

Complete the following form, and include supporting documentation, to create an account. You will receive an email to verify your email address, but your account will be restricted until it has been authorised by a Ministry representative.

Once authorised, you will receive another email indicating that your account has been updated, after which you will be able to sign in to the portal.

#### Your Details

General

Contact

Address

##### General Details

Email:

Title:

Surname:

First Name:

ID Number:

Date of Birth:

#### Register on Behalf of...

☐ The user in his/her own personal capacity

☐ On behalf of a company as an agent or employee

☐ On behalf of another person as agent or employee

#### Terms and Conditions

☐ By checking this checkbox, you agree to the Terms of Use and Privacy Policy of this website.

# Zambia – NSDI (web)





# Denmark Railway Expropriation

>





# Examples Desktop based systems

# STDM Social Tenure Domain Model

- > GLTN
  - > Global Land Tool Network
- > Plugin to QGIS
- > Support
- > a fit-for-purpose land registration system



# SOLA Solutions for Open Land Administration

- > FAO
  - > Food and Agricultural Organisation
- > Complex deployment
  - > Support ?
- > Comprehensive land registration system
  - > land admin workflow tested
  - > field data collection
- > Implemented in developing countries



# What system do we need in the future ?

- Location of data ?
- Access to data ?
- Software ?



# Location of Data

- > Central Integrated Data
- > One Database
- > Internet
- > Web Application
- > Cloud ?
  - > stored with professional hosting company
- > Distributed datasets
  - > within maintaining organisation
- > Original data stored in multiple locations
- > Uniformity of data
  - > standards

# Access to & Maintenance of Data

- > Transparent / Open ?
  - > Authorisation
- > Chiefdoms
  - > initiate changes
- > Surveyor General's Department
  - > maintain changes
- > Other Institutions
- > Ministries /land management board
  - > view only
  - > selected parts of the data
  - > aggregate data (statistics)
- > Public
  - > view only
  - > start applications ?

# Software (1)

- > Web application
  - > Internet
  - > Central
  - > changes provided via Internet
  - > sharing / viewing of data
- > Desktop software
  - > internal / local area network (LAN)
  - > changes provided via forms

# Software (2)

## > Open Source

- > degree of custom development
- > free software  $\neq$  no costs
- > control over software changes

## > Proprietary

- > license costs
- > vendor lock-in
- > proven
- > no influence on functionality

