IMPACTFUL CONTRIBUTION OF GIS ON RWANDA'S LAND TENURE REGULARIZATION PROGRAM

AKUMUNTU ATHANASE

DIRECTOR OF MIS AND IT

RWANDA LAND MANAGEMENT AND USE AUTHORITY

&

RUTAGENGWA ALEXIS

HEAD OF SURVEYING LAND USE PLANNING AND MONITORING DEPARTMENT

KIGALI, NOVEMBER 2019

Presentation outline

1. LAND TENURE REGULARIZATION PROGRAME (2009-2013)
2. GIS CONTRIBUTION TO LTR
3. LAND ADMINISTRATION INFORMATION SYSTEM AS A GAME CHANGER

LAND TENURE REGULARIZATION PROGRAME (2009-2013)

Rwanda in brief

- Size: 26,338 square kilometers
- Populaition: 12,374,397
- Population density: 470 people per Km2
- Administrative entities:

- 5 provinces
- 30 districs
- 416 sectors
- 2,148,cells
- 14,837 villages

LAND TENURE REGULARIZATION PROGRAME (2009-2013)

- Rwanda has known a successful land tenure reform since 2004 from the establishment of a framework to record land right for all rightful owners by the land policy initiated which will be successfully completed by 2013.
- The initiative was so ambitious and not easy to accomplish without strong partnership and cooperation but mostly the good leadership which was the main driver of the reform in question.
- Apart from such legal framework, there was a strong need of tools that would practically and technically support the land tenure regularization programme and one of them was the Geographic Information System application(GIS).

Major components of land reforms

Development and refinement of policy and legislation

Establishment of land management organizations

National Programme for regularization of land tenure

Development of a land administration systems and procedures

Development of national and District Land Use Plans

The systematic land registration

- According to the land law, all land must be formally registered parcel by parcel(systematically).
- Cell was considered as the land registration administrative unit, and a participatory approach with the cell committees was applied
- 10,4 million parcels have been registered in 2,148 cells and less than 1%(11,840) disputes were registered: 80% of conflicts were identified as intra-family related.
- General boundary survey(visible boundaries) was applied with ortho-photos/satellite images
- The pilot phase was carried out in 2007
- A simple MIS nicknamed LTRSP was established to support the LTR
- The national wide roll out started in June 2009 up to August 2013

Systematic land registration cont…

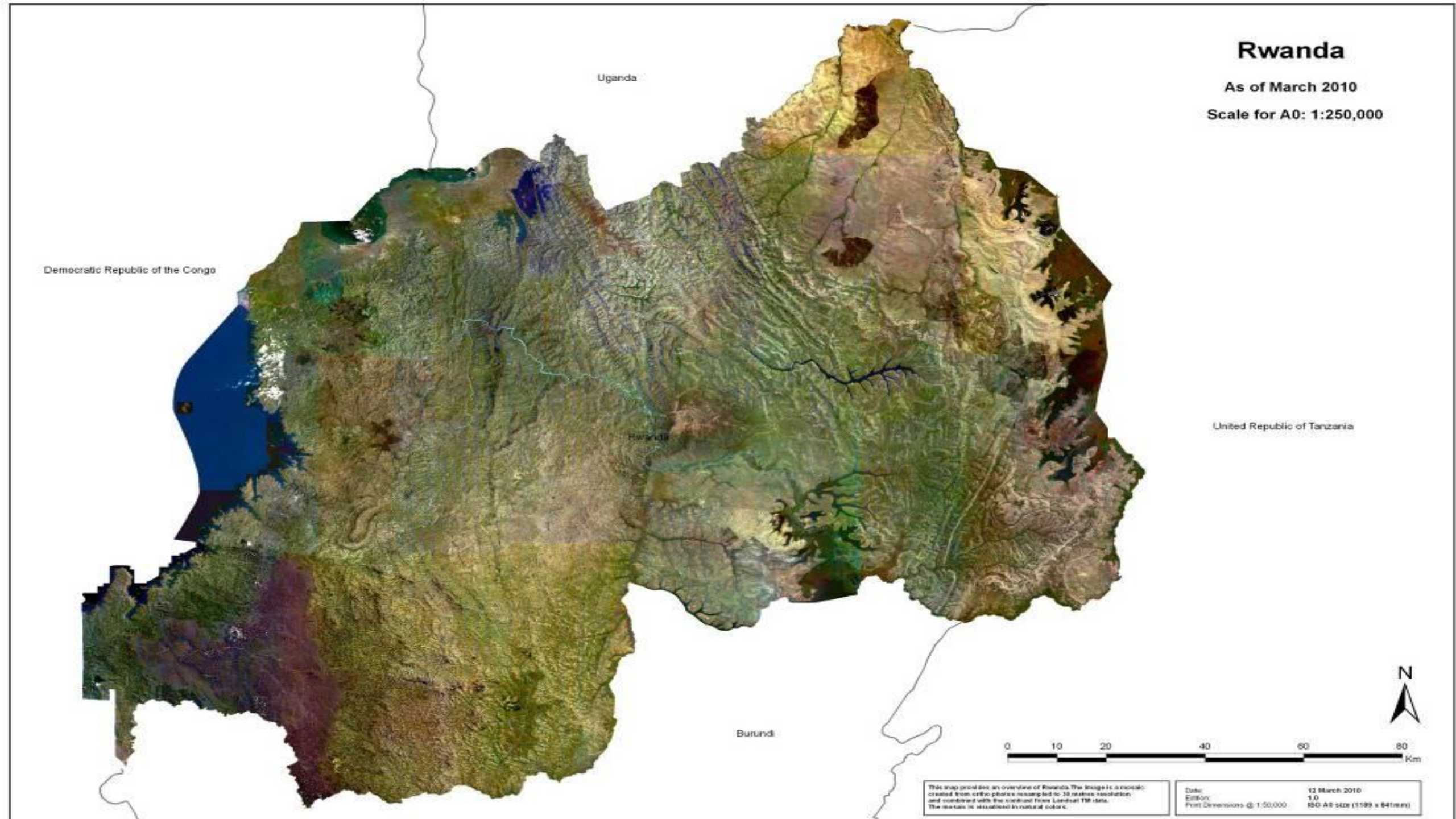
Funds mobilising for LTR

- Total cost: 56 million USD (Government of Rwanda, DFID, SIDA, Netherlands, EC/GCCA, IFAD)
- Cost-recovery approach – 1000 Rwf (=1.6USD)/ rural area and 5000RWF (=8.3USD)/Kigali City – In total 7million USD recovered.

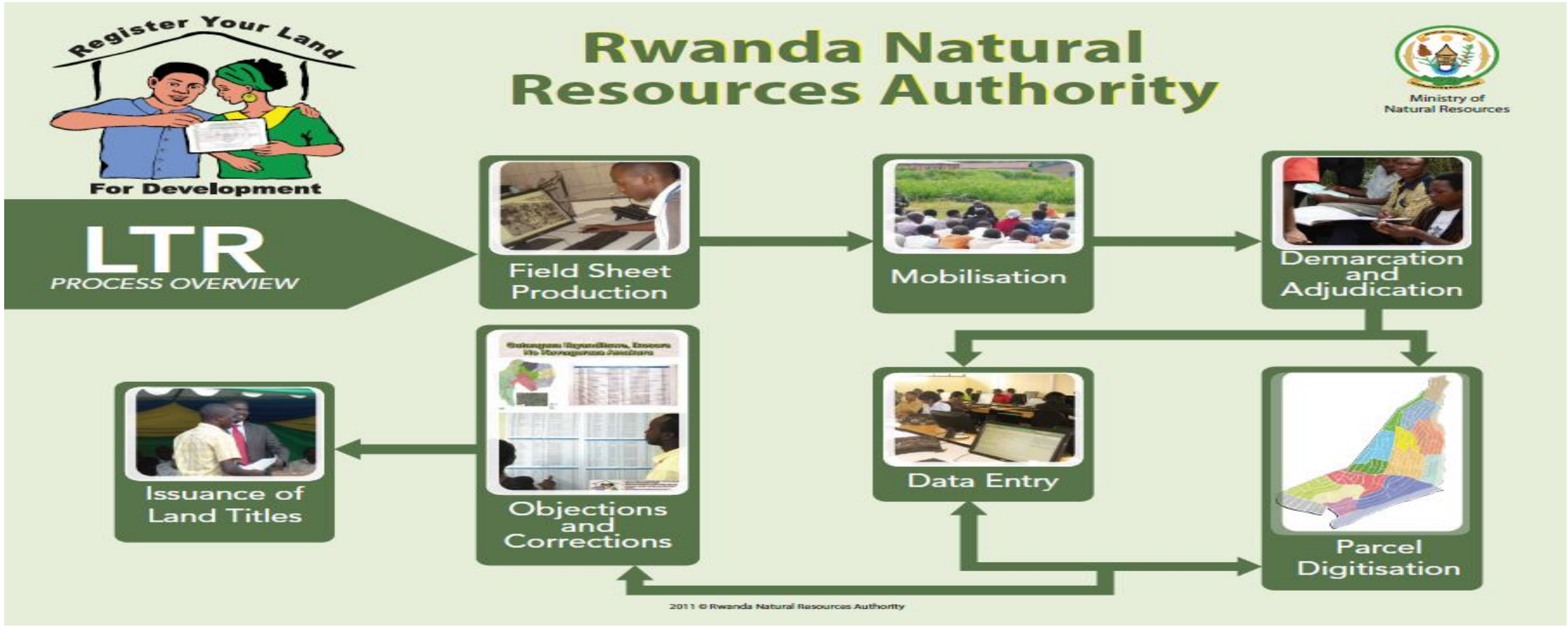
LTR Approch

- Initial estimation of 7.9 million parcels of land in Rwanda in 2148 cells
- Land tenure regularization: parcel by parcel and cell by cell
- Participatory approach with Cell Land Committees
- General Boundary principle – Land surveying – with aerial/satellite ortho-photos
- National roll out started in June 2009, a support team joined in July 2010

- Rwanda has 26,338 sqkms
- 4 Provinces plus the City of Kigali
- 30 Districts
- 416 Sectors
- 2148 Cells


Rwanda
As of March 2010
Scale for A0: 1:250,000
Uganda
Democratic Republic of the Congo
Rwanda
United Republic of Tanzania
Burundi
N
0 10 20 40 60 80
Km
This map provides an overview of Rwanda. The image is a mosaic created from ortho photos resampled to 30 metres resolution and combined with the contrast from Landsat TM data. The terrain is visualised in natural colors.
Date: 12 March 2010
Edition: 1.0
Print Dimensions @ 1:50,000 ISO A0 size (1189 x 841mm)

Steps involved in systematic land registration



GIS CONTRIBUTION TO LTR

- GIS was used in the demarcation of boundaries of parcels using the digital ortho photos.

- ArcMap 9.3 with concurrent licenses was used by the staff of former National Land Centre now Rwanda Land Management and Use Authority(RLMUA) during the LTR

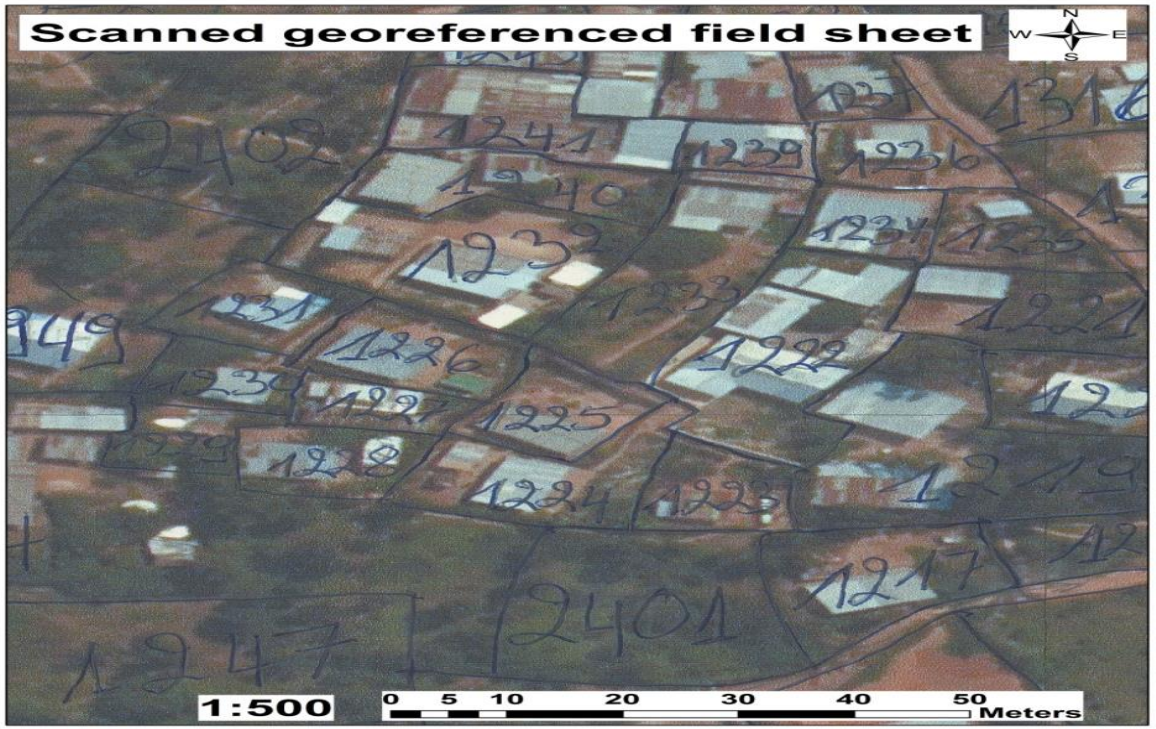
- The maps were taken to the field where the demarcation of parcels boundaries had to take place(Drawing boundaries of parcels using the field sheets/field map). The demarcated parcels were further processed in GIS using the digital pen technique.

Field Sheet preparation – by Cell

Locating parcels on index map

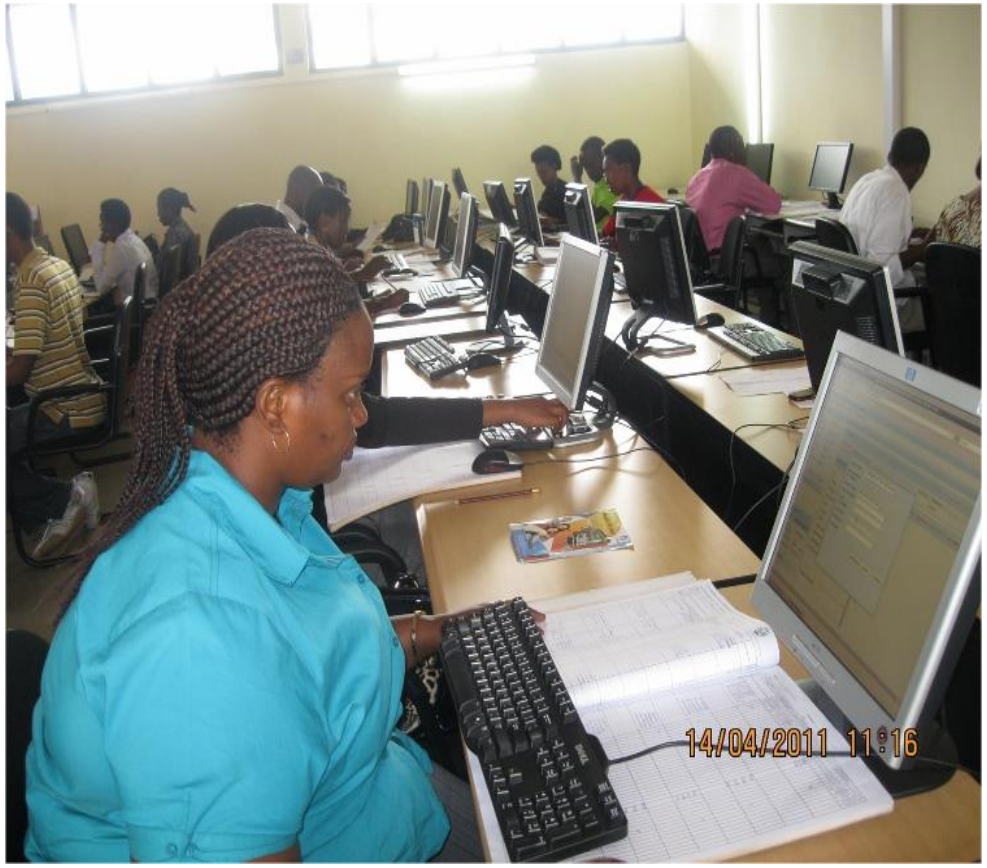
GIS CONTRIBUTION TO LTR Cont…

- The geo-processing in GIS was done by scanning the field sheets, Geo-referencing and vectorisation of boundaries of parcels

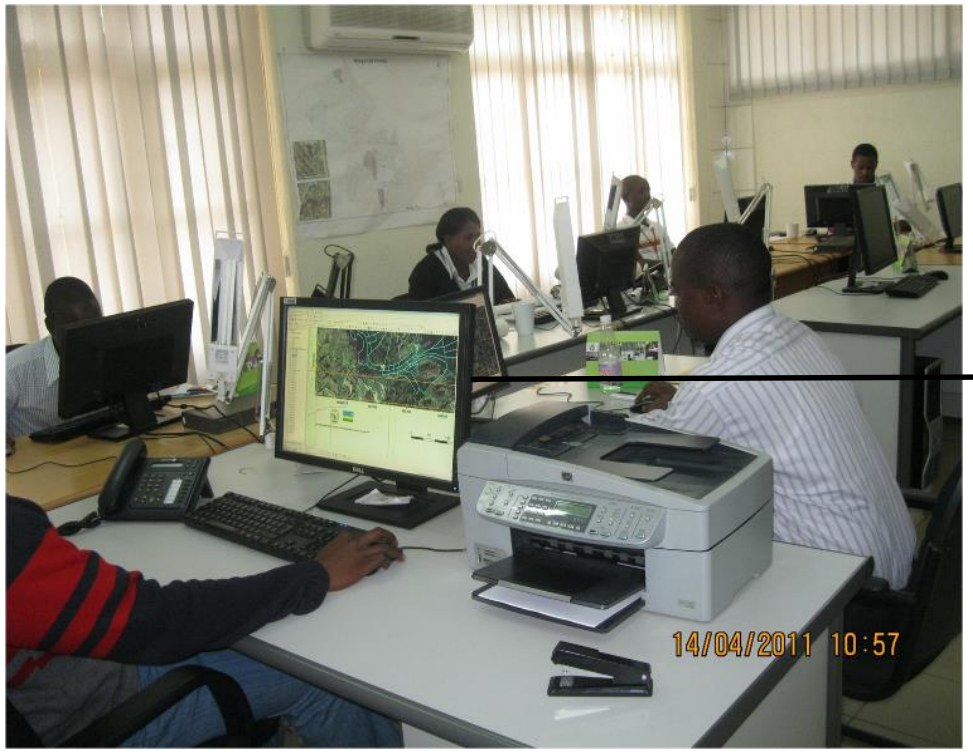


Map digitization and data entry

DIGITIZATION

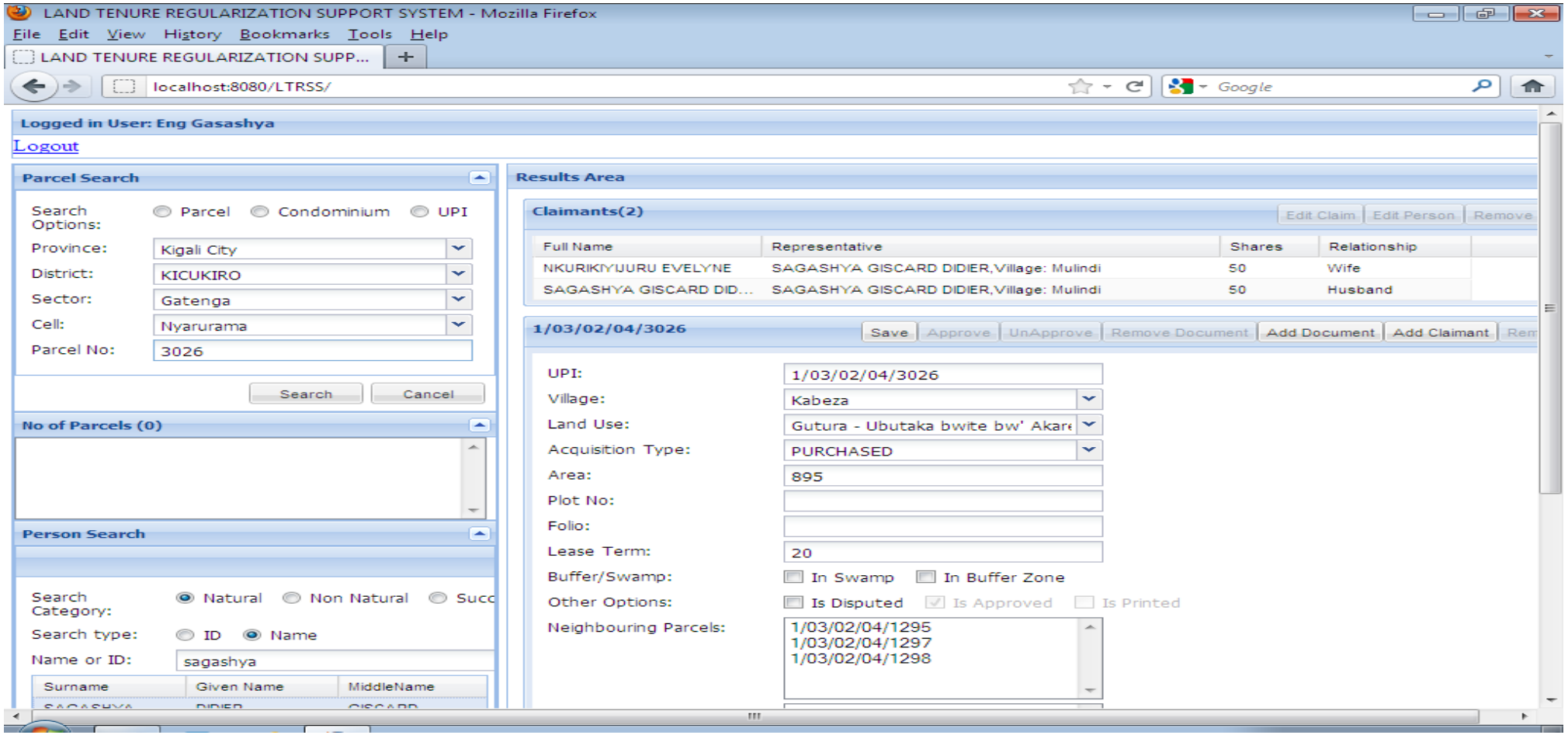


Geo processing in GIS

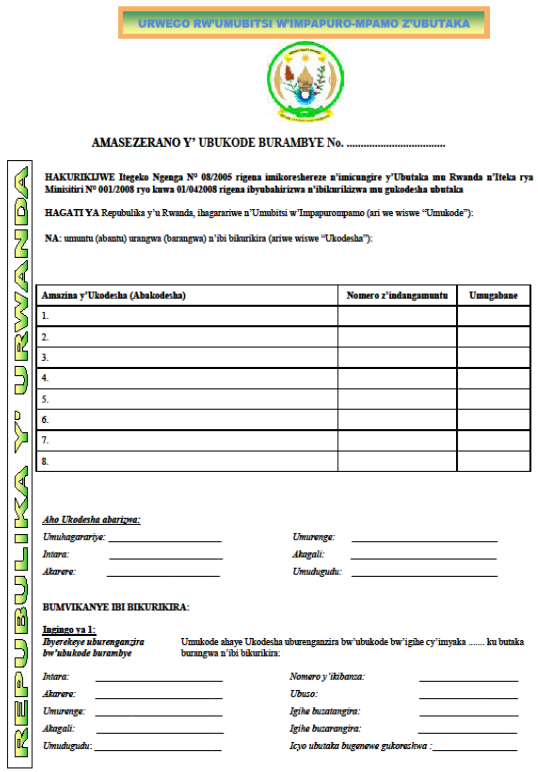


Geo processing in GIS cont…

Land MIS(LTRSP) has supported the LTR



Mass printing(production) and issuance of of Land Titles after processing



URWEGO RW'UMUBITSI W'IMPAPURO-MPAMO Z'UBUTAKA

REPUBULIKA Y' URWANDA

AMASEZERANO Y' UBUKODE BURAMBYE No. .....

HAKURIKIJWE Itegeko Ngenga N° 08/2005 rigena imikoreshereze n'imicungire y'Ubutaka mu Rwanda n'Iteka rya Minisitiri N° 001/2008 ryo kuwa 01/042008 rigena ibyubahirizwa n'ibikurikizwa mu gukodesha ubutaka

HAGATI YA Repubulika y'u Rwanda, ihagarariwe n'Umubitsi w'Impapurompamo (ari we wiswe "Umukode"):

NA: umuntu (abantu) urangwa (barangwa) n'ibi bikurikira (ariwe wiswe "Ukodesha"):

Amazina y'Ukodesha (Abakodesha)	Nomero z'indangamuntu	Umugabane
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Aho Ukodesha abarizwa:

Umuhagararije: _____ *Umurenge:* _____

Intara: _____ *Akagali:* _____

Akarere: _____ *Umudugudu:* _____

BUMVIKANYE IBI BIKURIKIRA:

Ingingo ya 1:

Ibyerekeye uburenganzira bw'ubukode burambye Umukode ahaye Ukodesha uburenganzira bw'ubukode bw'igihe cy'imyaka ..... ku butaka burangwa n'ibi bikurikira:

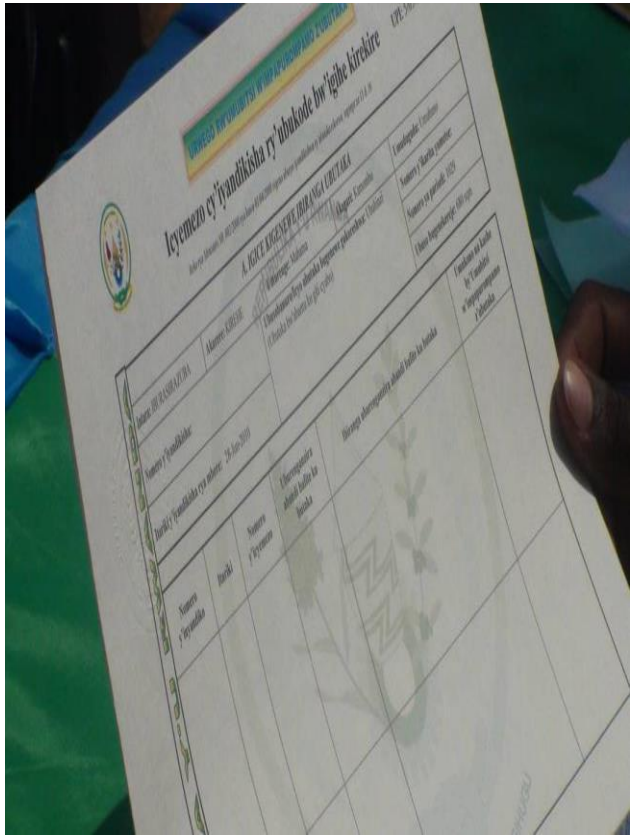
Intara: _____ *Nomero y'ikibanza:* _____

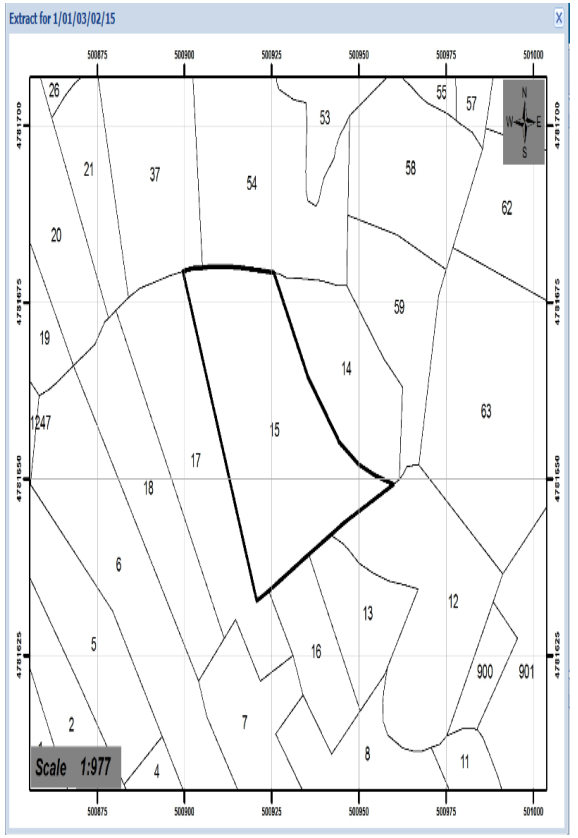
Akarere: _____ *Ubuso:* _____

Umurenge: _____ *Igihe buzatangira:* _____

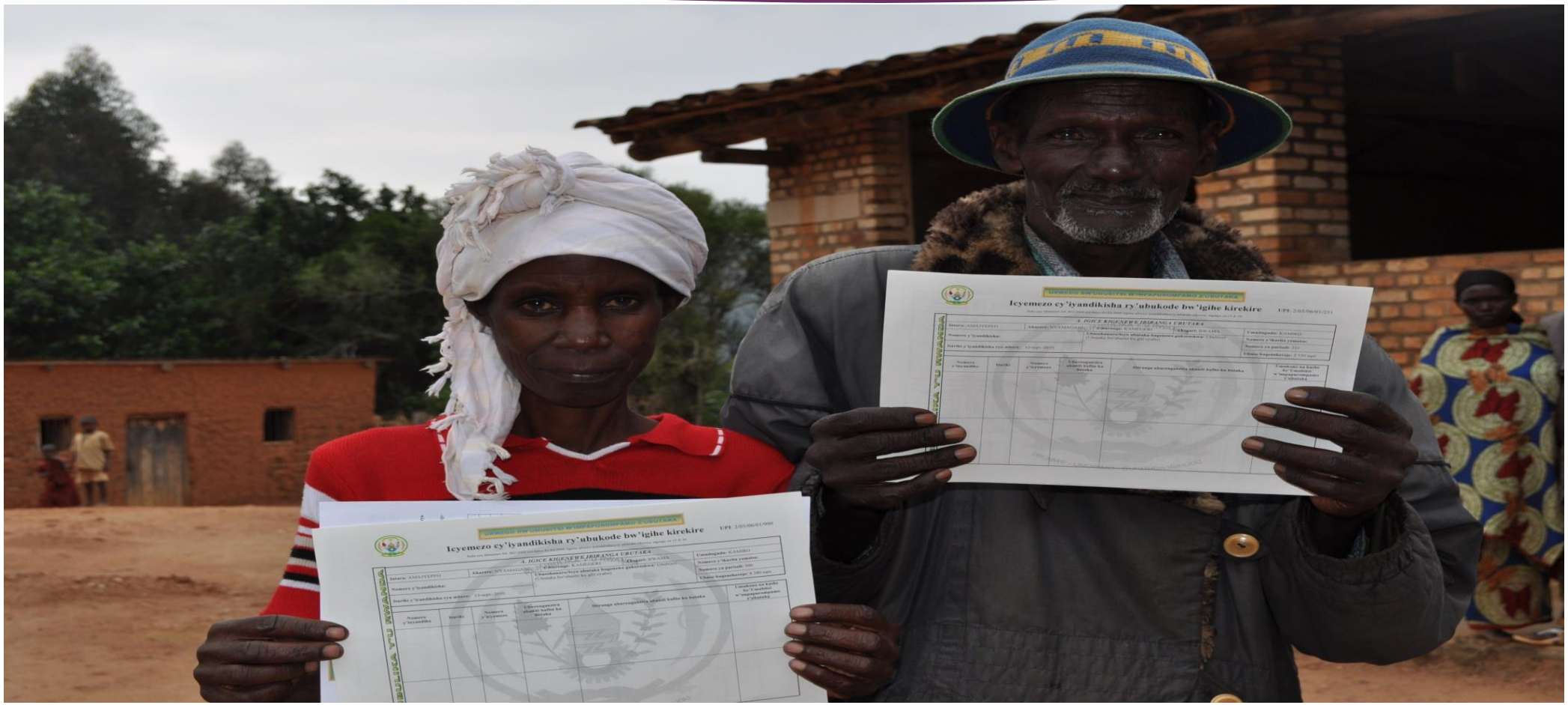
Akagali: _____ *Igihe buzarangira:* _____

Umudugudu: _____ *Icyo ubutaka bugenewe gukoreshwa :* _____





Going home with land leasehold title



Tremendous results and workforce

- In 2148 Cells a total of 10.3 millions parcels were demarcated
- Out of them 87% had full information on claimants (June 2013)
- 324,000 parcels in imidugudu demarcated and Adjudicated (January 2015)
- Less than 1% (11,840) disputes registered

  80% of conflicts are intra-family related
- 8.4 million titles approved and Printed for issuance (June 2013)
- 6.5million Titles collected by owners (June 2013)

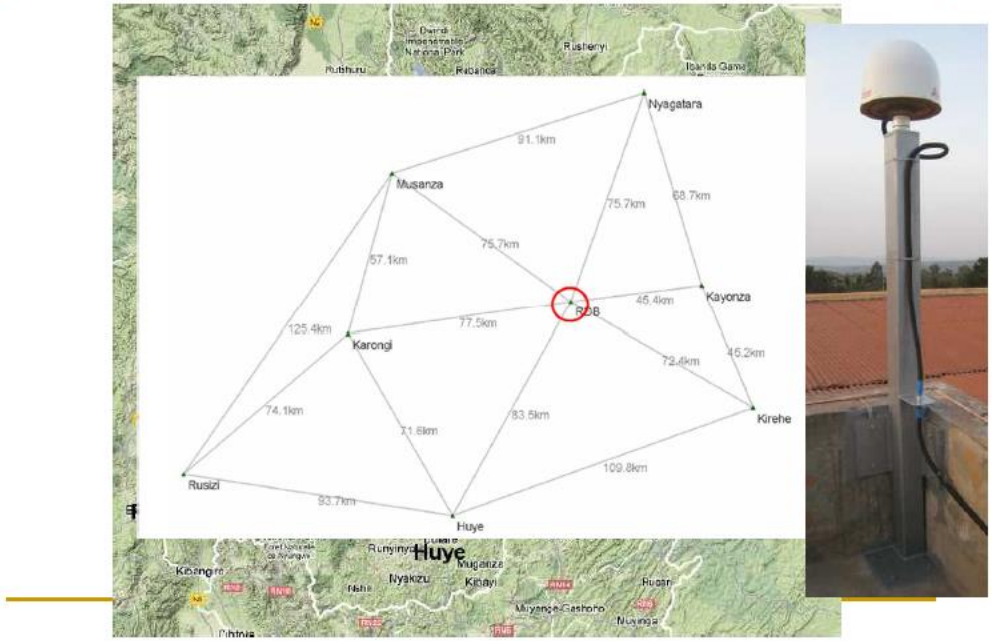
- 120 Field Managers – 4 per Districts
- 4500 to 5000 people per day for two years involved in Demarcation and demarcation
- 90 GIS Professional for digitisation – Working double shifts to maximise use of Arc- GIS license
- 400 Data Entry Clerks – working double shift
- 120 People doing checking
- 300 causal staffs doing stamping and packing
- 50 Project Drivers and 60 hired cars

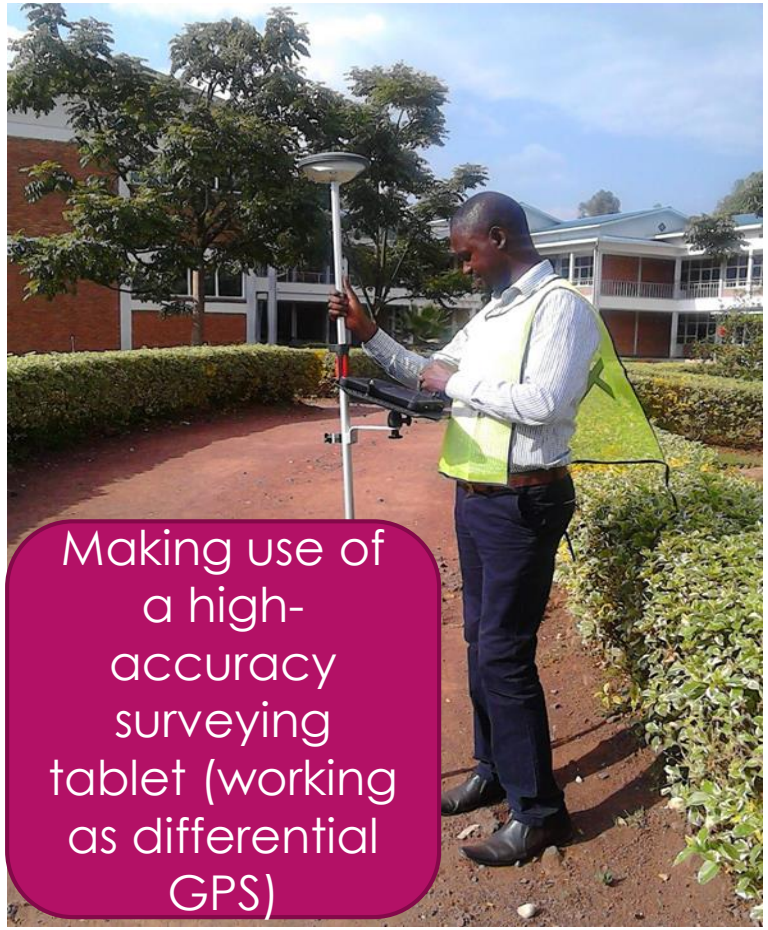
LAND ADMINISTRATION INFORMATION SYSTEM AS A GAME CHANGER

- After the systematic land registration what next?
- The Land Administration Information System(LAIS) was piloted in 2010 with the main purpose of maintaining the newly born land registrar
- LAIS was also established to make the land registry interoperable and integrated to other key systems having a direct impact on the Rwandan economy such as taxation, banking(mortgages), housing, agriculture and everything else that rely on land information hold by the land registry.
- LAIS was put in place to facilitate the citizen access land services in a decentralized way
- LAIS was designed, tested and piloted in 2010 and deployed in end 2012
- All data from LTRSS were migrated into LAIS
- All districts were connected to LAIS through VPN
- Its linked to all bank through e-MRS, BPMIS, RRA, IREMBO, ALIS, IRPV(valuers), IECMS(Justice), Smart Nkunganire, etc..
- Has been used as the measure of property registration indicator- contributing to doing business Rwanda was recently named 3rd world wide and 1st in Africa In the WB Doing Business report (in property registration).

LAIS cont…

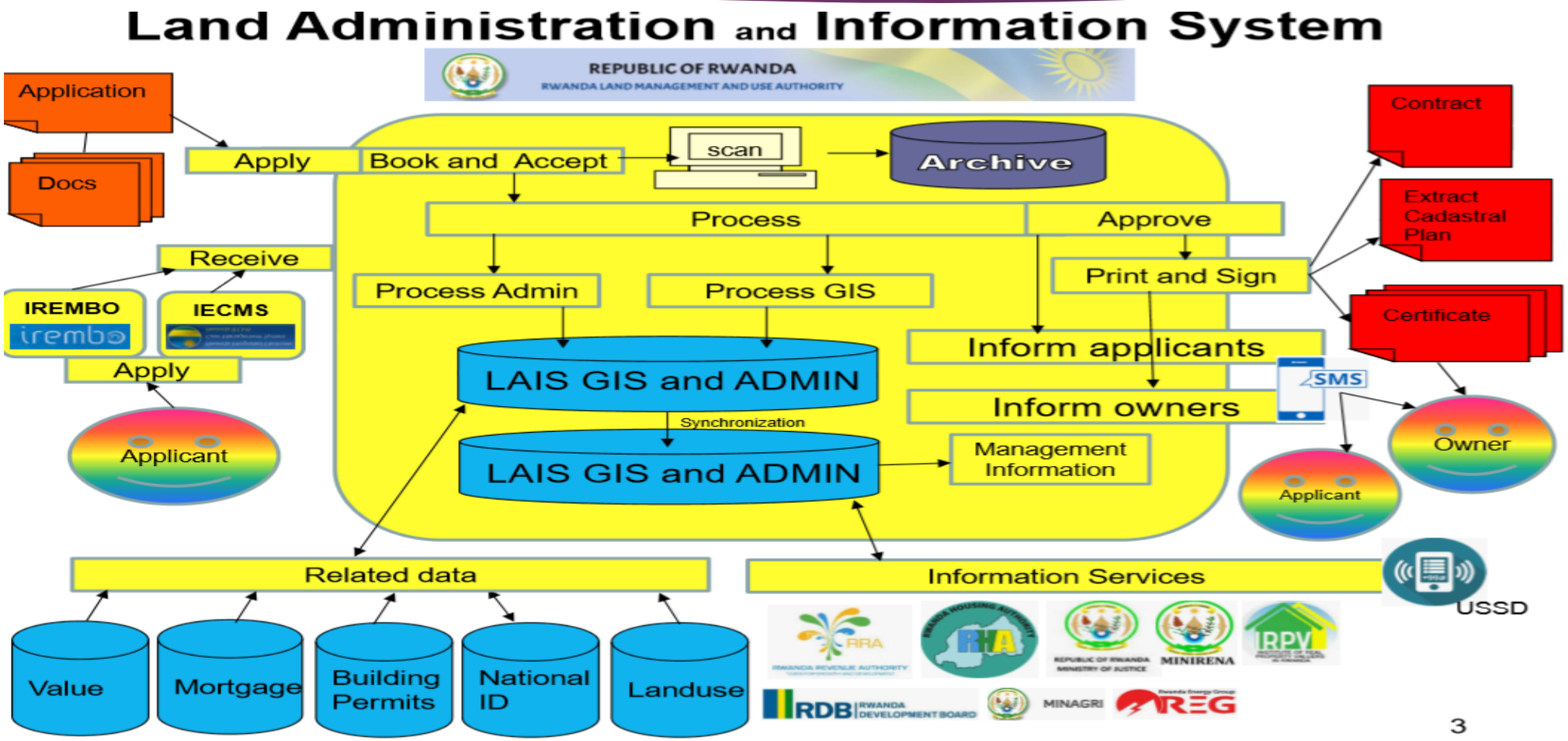
CORS – Geodetic Reference Network (8stations)





Making use of a high-accuracy surveying tablet (working as differential GPS)

LAIS ARCHITECTURE



THE END

THANK YOU