Rural Cadaster Software System (LIS) presented On Smart Land Administration Seminar

By: Yohannes Redda
Mobile no.: +251-910-43-7215
E-mail: yowred@gmail.com

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Introduction

- NRLAIS is a unified system which completely designing and developing based on open source licensed software's.
- Web-based system and developed in a pilot form that can be adopted and customized by the regions.
- It is “toolkit” design and applies LADM (ISO)
- Easy to deploy with docker containers
- Contains five modules. Such as, MASSREG, WORLAIS, ZONLAIS, REGLAIS and CENLAIS.
- Implemented in PostgreSQL database with an extension of PostGIS.
- Can operate on Linux (server side) and window (Client side).
- Supports English & local languages (Amharic, Tigrigna and Afaan-Oromo).
Risk due to fire

Slow access to land information
Overviews of NRLAIS (i.e. Vision)

The ‘core’ of the system for cadastre and land registration maintenance

Aggregate data, monitor and support woreda operations

Analyses data for federal purposes and distributes through NSDI.

The ‘core’ of the system for cadastre and land registration maintenance.

Data migration

existing land records

Certificates

Applications

Kebele Activities

Mass registration

Quality control

Mass data collection

Regional Database

Regional Land Bureau

REGLAIS

Woreda Database

WORLAIS

Woreda Land Office

Regional Land Bureau

REGLAIS

Regional Database

Federal Office

CENLAIS

National Database

NSDI

Export Data

Standards

Aggregation

Aggregation

Mass data

Mass data

Data migration
Development of NRLAIS

- Summary report on the establishment of a Harmonization land administration system (2010).

**Approach** of ICT strategy and *options* for establishing NRLAIS;

a. Allow uncoordinated development by RS
b. Federal established *only standards* by regulation and methodology authority (RS develop by themselves)
c. Centralised Federal system (No flexibility for RS)
d. *Hybrid Approach* – standards (like option b) *plus a national pilot* that can be adapted by RS if wished.

*Option “d” is recommended as the way forward.*
Assessed existing LIS. Such as, ISLA, rcis, iMASSREG & iWORLAIS.

Technical requirement/spec. for NRLAIS

Established WGs

Developed NRLAIS software

Developed Mobile application for SLLC

Operational Acceptance Test (OAT)

Upgraded IT strategy for roll-out
All the software’s are *open source licensed* and approved in the link: [https://opensource.org/licenses/alphabetical](https://opensource.org/licenses/alphabetical)

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<thead>
<tr>
<th>Component</th>
<th>License</th>
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<tr>
<td>ExperMaps</td>
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<tr>
<td>NRLAIS</td>
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NRLAIS has three major tools

- Large scale data conversion tool
- Land record maintenance tool
- Data aggregation tool

Relation between the Three Tools

MASSREG (Mobile App) → WORLAIS → Aggregation Tools

Provide initial land records

Provide changes made to the land records
MASSREG

Large scale data conversion tool.

Data encoding

Data migration from old systems

SLLC workflow management

Issuance of Certificate

Transferring certified parcels to WORLAIS
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<th>PRSS</th>
<th>CMSS</th>
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General WORLAIS Workflows

1. Initiate & Register Application
2. Approval
3. Data Manipulation
4. Public Display
5. Close Application
6. Certificate Issuance
WORLAIS

Maintenance of the *spatial and textual data* of the land records in an ongoing manner.

Implementing the business rules for land record maintenance

Digital archiving of supporting documents

**ZONLAIS/REGLAIS/CENLAIS**

Allows retrieval of land records

Provides a large set of standard statistical reporting tools

No possibility to manipulate land records
Replication of Woreda data to upper levels

- **Incremental updates** (push to the higher level)
  - Transactions
  - Updated land records
  - Updated geometry of parcels

- **Online or offline**
  - Available network infrastructure
  - Via USB flash drive
  - Configured to daily or weekly updates
Data Communication Infrastructure
Data Migration

- Data migration capabilities from old systems (manual & web-based).
- The existing data can be transferred *through manual or automatic*.

Flow diagram of NRLAIS data migration procedure (*for textual and graphical data*).
Sustainable development is not achievable without sound of land administration.
Major Challenges

- Weak institutional set-up
- Insufficient supply of Inputs (both technology and material)
- Lack of experiences in undertaking registration and certification of communal land tenure
- Lack of harmonization legal frameworks
  - Technical & skill gabs
  - Lack of well organized data
  - Financial resource challenges…..for infrastructure dev’t, for trainings, technologies .....
  - Absence of an integrated national land use policy & ILUP
Some Screenshots of NRLAIS UI
Visualizing spatial data in web apps

MASSREG Mapping Android App

Tracking system
View detail information of holder/s on each parcel

Parcel: 1

Region: 01

Woreda: 010205

Kebele: 010205004

Area: 453.34 M²

Adjudication ID: 07/02/05/004/00001

Adjudicated By: 0

Land Use: Other

Notes:

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<td>Boundary Correction</td>
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<td>18/7/2010 EC</td>
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NRLAIS Sub-system to maintain spatial data’s
Cadastral Map/certificate

Replication of land records

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<th>Replication No</th>
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<td>031310</td>
<td>15942</td>
<td>Tue Mar 27 08:44:18 UTC 2018</td>
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Create Replication

Replication Status
## Number and Area of parcel by Type of Household Head and Woreda

**Data Status:** All  
**Percentage Mode:** Area  
**Area From:**  
**Area To:**  
**Report Generated On:** 2018-11-27

### Kebele

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<thead>
<tr>
<th>Kebele</th>
<th>Male Headed</th>
<th>Female Headed</th>
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<th>Institutional Holders</th>
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<tbody>
<tr>
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<td>Number of Parcels</td>
<td>Area of Parcels</td>
<td>% of Total Area</td>
<td>Number of Parcels</td>
<td>Area of Parcels</td>
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Thank you for your attention!!!