

# GIS Applications On Rural Land Administration. The Cause Of Amhara National Regional State Of Land Bureau

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**Abstract:** In amahara region has 148 wordas and all worda has registered first level attribute data by ISLA (Information System for Land Administration) systems is start the first level land registration system that pointed at the modern land management system, Amhara region has introduced land registration system since 2002 G.C. Land registration systems were given little attention in Ethiopia before the 1990s. Berhanu and Fayera state the practice before 1998 as follows: In Ethiopia, there has never been a system of systematic rural land registration. During (Moges, 2020) The Amahara region of rural Land administration system follows restructured way of digital system of cadaster was covered by different organizations supporter for cadastral activities Providing Second level land certification was start in 2011G.C on pilot project areas of Gozamin in East Gojjam and Gerado in South Wollo zone. The pilot project of the two worda result is good. The region is too conducted and communicates different projects for launch cadasters in 2014 G.E. Those projects are: REILA(Responsible Innovative Land Administration)

**Keywords :-** Land Administration, Land Information ,Land use Planning, Pilot project

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## 1. INTRODUCTION

The role of GIS in the administration of land and land assets. Land is both a corporeal product and an intellectual concept in that the rights to own or use it are as much a part of the land as the matters rooted in its soil (Dale 1991; Dale and McLaughlin 1988). From a lawful perception, land extends from the center of the Earth to the infinite in the sky. Land refers to the methods of recording and distributing information about the possession, value, and use of land and its associated resources. The function of land registration is to deliver a safe and certain foundation for the achievement, satisfaction, and discarding of rights in land (Larsson 1991). A cadaster is similar to a land register in that it contains a set of records about land. A cadaster is an information system consisting of two parts, a series of maps or plans showing the size and location of all land parcels, together with text records that describe the attributes of the land. The type of boundaries recorded on cadastral maps will depend on the definition of the cadaster. (Dale & McLaren, 2005).

In Amhara region has **148** woredas and all woredas has registered first level attribute data by **ISLA** (Information System for Land Administration) systems is start the first level land registration system that pointed at the modern land management system, Amhara region has introduced land registration system since 2002 G.C. Land registration systems were given little attention in Ethiopia before the 1990s. Berhanu and Fayera state the practice before 1998 as follows: In Ethiopia, there has never been a system of systematic rural land registration. During (Moges, 2020) The Amhara region of rural Land administration system follows restructured way of digital system of cadaster was covered by different organizations supporter for cadastral activities Providing Second level land certification was start in 2011 G.C on pilot project areas of **Gozamin in East Gojjam and Gerado in South Wollo zone**. The pilot project of the two woredas result is good. The region is too conducted and communicates different projects for launch cadasters in 2014 G.E. Those projects are:

- ✓ REILA (Responsible Innovative Land Administration)
- ✓ SLMP (Sustainable Land Management Program)
- ✓ IFAD (International Fund for Agricultural Development)
- ✓ LIFT (Land Investment for Transformation)
- ✓ CALM (Climate Action through Land Management)

Now a day in Amhara region has completed **115** woredas and ongoing cadaster activities **8** woredas for cadastral/modern land registration system is done. Finally **123** woredas are done cadastral land registration system from **148** woredas in a region. Amhara regional land bureau is done a cadastral activity is confirmed immediately the NRLAIS system begin a transaction of digital transaction system. Amhara Land Bureau was done NRLAIS system by **100** woredas. NRLAIS system is functional for a combination of attribute data and special data sources will meet together after the complete of cadaster. **But regarding to need of project fund their might is start by four/three water shade kebeles.** After the end of the year the region add 20 woredas to join for NRLAIS system.

## 2. General Objectives

The overall of the general objectives of the term paper is to assess the GIS application in Rural Land administration bureau of Amhara region.

### 2.1. Specific Objectives

- ✓ To evaluate application of GIS in land registration of cadastral (Second Level Land certification) system.
- ✓ To assess application of GIS in Land information system of NRLAIS.
- ✓ To identify the involvement of GIS application in land development and land use planning.

## 3. Methodology

This report is collected and organized from the primary and secondary data sources i.e. different working manuals, proclamations and oral interviews of GIS experts in detail information for fill the gaps of our understanding GIS application in Amhara rural land administration bureau.

## 4. Application of GIS in land registration of cadastral (Second Level Land certification) system

### 4.1. Attribute Data preparation

From these procedures have two data sources of attribute and special data sources. Attribute data source has a system of ISLA (Information System for Land Administration) is register all land parcel information based on three categories of **File Reference, holder and parcel categories**. The attribute data registered based on by woreda levels of all kebele by a given code of by database

each woreda. AM/JJ/57/2/3). AM= Region, JJ= Zone, 57=Woreda, 2= kebele, 3= land holder procedural way of record the attribute data. After the record of the attribute data which is an input for a cadaster demarcation purpose by export the data and make preparation filed sheet paper by A3 paper for access attribute data. Sorting list is used to find easily land holders by Amharic letter order preparation for simplified by a demarcation cause might be unclear information(መመሪያ ቁጥር\_3\_Spatial\_Data\_Directive\_as\_Getahun\_Revised.Pdf, n.d.)

#### 4.2. Spatial data using Orthophoto:

The approach of using large-scale ortho photo maps produced from aerial photography has been selected for charting the general boundaries of rural land. Currently the institution is used to aerial photography for high resolution (25cm X 25cm) digital aerial photograph or ortho photo preparation for a demarcation purposes is available in the institution. Second level land certification has five procedures to produce a certifications and to deliver for the land holders.

- ✓ The parcel boundaries will be drawn on the field map using the pencil and Bolden by pen if error free. The parcel will then get a unique identification number (holding ID) by the field team from attribute data. (Full: AM/JJ/57/2/3).
- ✓ The holder ID will be written on the field map inside the parcel boundaries. Writing of Holding & Parcel “ID” is enough for demarcation. Example.0001/01.
- ✓ Some parcel tape measurements and scaling on the ground may be necessary in order to mark invisible boundaries on the field map. Systematic Registration (parcel by parcel)

#### 4.3. Demarcation

The parcel boundaries will be drawn on the field map using the pencil and Bolden by pen if error free. The parcel will then get a unique identification number (Holding ID) by the field team from attribute data. (Full: AM/JJ/57/2/03/01) The holding ID will be written on the field map inside the parcel boundaries. Writing of Holding & Parcel “ID” is enough for demarcation. Example.0001/01. Some parcel tape measurements and scaling on the ground may be necessary in order to mark invisible boundaries on the field map. Systematic Registration (parcel by parcel)

#### 4.4. Digitalization (Geo referencing)

Digitization is the process of converting information into a digital computer-readable format. The result is the representation of an object, image, sound, document, or signal usually an analog signal obtained by generating a series of numbers that describe a discrete set of points or samples. The extraction of objects (point, line and polygon from the geo-reference data). Creation of Geodatabase, Dataset and Feature Classes. Data modeling (Vector data) after digitization of a parcel, right-click to enter the required attribute data/information. The data to be entered here depends on the registry situation in the Keble (Holding Parcel ID). (Dushaj et al., 2009)

#### 4.5. Public Display

The topology checker is a function that controls if the common boundaries between parcels have no gaps or overlaps. Before proceeding, make sure that the external database is completely updated/Textual data with all changes and new information found in the field, as well as in the registry books. The example below uses an extract from the ISLA database used in Amhara. Linking the prepared Excel database file with the Parcels shape file (in the Join field list and Holding/Parcel ID in the Target field list). Creation of the Public display Index maps which is used for identifying the local area of each parcel and overview maps, and finally, print it on A0 paper size. **Correction (editing) is there** after the completion of public Display, the spatial & textual database should be edited based on the findings. PD for confirmation of the work for preparation of certifications.

#### 4.6. Certificate preparation

Scale: Parcel maps are large scale i.e. too small area of parcels 1:500 and too larger area of parcels 1: 1000. Map Elements: Authority, Legend, North arrow, etc.

#### 4.7. Attachments:

Green book, Registry Book and Parcel maps are attached/linked each other by central coordinates (x, y) (Amhara region case). Issuance of SLLC to land holders: Every land holder who passes through the above registration process/steps can collect his SLLC from the Institution.

### 5. Assess application of GIS in Rural Land information system of NRLAIS.

NRLAIS (National Rural Land Administration Information system) is a pre-requisite of cadastral activities ‘of (Second Level Land Certification) there must be needed functional of NRLAIS system. A system has a combination of attribute and special data sources. NRLAIS features and transactions. NRLAIS system has a combination of attribute and special data and using CMSS task of cadastral

maintenance sub system activities are there for split, consolidation, divorce and other transactions are must need GIS. Now a day in Amhara Land Bureau was done NRLAIS system by 100 woredas. NRLAIS system is functional for a combination of attribute data and special data sources will meet together after the complete of cadaster. After the end of the year the region add 20 woredas to join for NRLAIS system. **But regarding to need of project fund their might be start by four/three kebeles**



## 6. The involvement of GIS application in land development and land use planning.

Watersheds are categorized by their high degree of cultural and ecological variety and are measured as basic unit for sustainable development. The main goal of sustainable development is refining public welfare and protective the environment for next generations. Resources allocation particularly about natural resources which are limited is very complex process. One of such limited resources which are clearly marked in all around the world is land for various functions. Land use planning is a process based on socio-economic needs and spatial analysis of elements such as topographic shapes, vegetation characteristics, and soil and water resources. Since the land use planning process is based on analysis of combined spatial resources, use of effective tools for spatial analysis can be helpful. One of these tools is geographic information systems (GIS) which are widely used in land use planning process at national and global levels. One of the most useful applications of GIS for projecting and administration is land use appropriateness mapping and analysis (McHarg, 1969; Hopkins, 1977; Brail and Klosterman, 2001; Collins et al., 2001)(Miryaghoobzadeh & Shahedi, 2012). Land use planning in our country of Ethiopia and Amhara region land use planning policy and government attention is very poor. If the place of needed for some functional activity and use GIS land suitability analysis are there in amhara region land bureau. GIS in amhara region land bureau use the land development of large scale agricultural investment map preparation based on X, Y coordinate for the use of investment activity

## 7. Conclusion

GIS application system integration with rural land administration is very high and one part of the coin with rural land for the different purposes. In Amhara region Rural land administration bureau without GIS no any activity based modern land administration system establishment of GIS has a great full application of for rural land administration and cadastral system of (Second level Land Certification) contribution of GIS being from the demarcation activity to the end of certification produce activity is done by GIS applications. GIS is very essential for rural land information system of NRLAIS for functionality a tool of GIS integral for NRLAIS system of postgres Database for a function of Cadastral Maintenance Sub System (CMSS) used for boundary correction, merge/consolidation, split, special features, Expropriation transaction should be need for GIS application. So GIS is the back bone of rural land administration for a successful cadastral activity and modern land administration system buluding for the next generation of NRLAIS. NRLAIS system is good for land tenure transactions. But the system designed is talk about for Fit for purpose. Now a moment NRLAIS system is functional as usually of many problems is done for land tenure only. GIS application is good for rural land administration different purposes.

## 8. Recommendation

Amhara region is the so fast and activate a new ideas for implement in the ground based on land administration purpose. But no observe right and left what is the problem is that issue is there.

- ✓ The cadastral activity is demarcated for by a committee and a land holder & green book is not presented and boundary problems are there in some cadastral areas as conflict issues.
- ✓ A special and attribute data server is very poor and happen a problem there might be difficulty for retrieve or access the long last done data lost.
- ✓ Rural land Cadastral system(Second Level Land Certification) is not use multi purposes for courts, statics, gender issue office, revenue and financial institutions, land use and land valuations.
- ✓ An awareness of land holders about rural land cadastral system is very poor and there should be do for more.
- ✓ NRLAIS system is functional for cadaster worda all kebele should be done. But in amhara and others region being NRLAIS system by two or three cadaster kebeles and left the other kebeles no included NRLAIS system. This issue is done for need of budget and the problem is clear for anybody who asks the questions.
- ✓ Amhara land bureau main objectives are not going together .each directorate activity is not mixed. Modern land admiration paradigm shift is not functional.
- ✓ To more of use GIS more of done join approach should be built up for a sustainable development
- ✓ Lack of budget for improves the land and GIS problems.

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