

Parcel-based Data and Registration Formats: Issues and Improvements in SNNP Region

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1. Introduction

1.1 Current Land Rights Registration Process in SNNPRS

The SNNPR Government promulgated the Land Use and Administration Proclamation No.53/2003 based on the Federal and the regional constitution. The proclamation defined the right of land holders, i.e., the right to use, rent and inherit. In addition to this proclamation, an implementation guideline was developed by the former Environmental Protection, Land Administration and Use Authority of the region. Land under private cultivation is registered with its size and identification of the individual that has legal holding right.

The responsibility of undertaking the land registration is vested in elected community representatives at the sub-Kebele level, with the supervision and participation of Development Agents. After collecting the registration document of each land holder in a given Kebele, the committee is supposed to record all the documents' contents in one book; the same is done by the Wereda land use administration office after collecting the documents from every Kebele in the Wereda. The Wereda Land Administration office provides rural landholders with legal certificates of their land rights.

A land registration and title certification pilot programme was started in March 2004. The pilot was set up to generate lessons for a broader land registration and certification programme in the region. 11 Kebeles from 11 Weredas were selected and 7530 households registered and certified. The objectives of the pilot were to analyze farmers' perceptions of land registration and changes in attitude, and to evaluate technical and financial requirements for the land registration process

The pilot programme has been evaluated at a conference which was held in August 2004 at Kulito town of Alaba special Wereda. The conference was led by the president of the SNNPR Government. Higher Regional officials and Zonal and special Wereda administrators participated in the conference.

A traditional land registration programme was launched all over the region immediately after the conference, conducting awareness creation and technical training to the actors at Zonal and Wereda level. It was planned to register and issue certificates to one million households this was achieved for 700,000 households in 2005.

Characteristics of the registration process in SNNPRS

Land ownership	State
Registration system	Traditional title registration system is applied for both pilot and implementation programme; not GIS-based.
Type of landholding covered in the registration	Only private land holdings
Rights being registered	User rights
Basis of rights in land	The former formal land distribution (1975)
Registered landholders	Households—Joint titling (spouses) and Single as well.
Stage of implementation	Pilot evaluated in June 2004 and registration started in January 2005
<i>Progress</i>	1,000,000 households planned for 2005 for registration and certification and 700,000 achieved

1.2 Objectives

- to highlight rural land registration process and its progress in SNNPRS;
- to identify the constraints of the data types and registration formats used for parcel-based data recording in the region, and
- to make recommendations on the improvement of data types and registration formats.

2. Current Land Registration Data Types and Registration Formats Used in the Region

During the land right registration process, two registration forms are used:

- a) Registration Form 1
- b) Registration form 2 (Register or land book).

Registration Form 1 is used to collect and record parcel-based data for each household. Data are gathered in two copies of Form 1. One copy remains in the Kebele while the other one is passed to the *Wereda* Land Administration Office.

Registration Form 2 is the register, which in some countries is known as “Land book”. The purpose of this book is to record in one document all those registration data that are gathered from each household.

This register (Land book) is of two types. One is used at the Kebele level which is small in volume and the other one is used at the Wereda land use administration office which is large enough in volume so that it may accommodate all registration documents that are collected from all the Kebeles of any given Wereda.

The data registered in Form one include:

- a) Location of the parcel (survey plot): Zone, Wereda, Kebele, sub-Kebele;
- b) Name of the landholder or name of the guardian (in case of orphans);
- c) Number of plots that any given household may hold (fragmentation of landholdings are common in the region);
- d) area (in ha) of each plot (and their summation);
- e) Name of the farmers that are sharing boundaries or natural features bounded with each parcel in the North, South, West and East (used as parcel identifier);
- f) Current land use type of the plot;
- g) Grade of the soil fertility of each plot expressed as fertile, medium or poor soil (this is based on simple field observation); these data are considered to be helpful for land resource survey during the process of land consolidation;
- h) Family members, children and other members of the family living with the household, are registered. It is expected to be used for the analysis of agricultural density and census data for management activities, but its importance in regard to land administration needs to be revised.

3. Issues, Constraints and Opportunities with Respect to Data Types and Data Formats

3.1 Issues

- The Importance of Registry Book is not so significant, since parcel-based data are registered in two copies of Form one;
- An actual system of updating records has not been established in the region;
- The data types and data formats used in the region have not reached the required standard because of lack of experience.

3.2 Constraints

- Since fertility status data is taken by simple field observation without scientific analysis, it does not give realistic information, used for making decisions in the land management activities;

- Name of the farmers that are sharing boundaries or natural features bounded with each parcel in the North, South, West and East are registered in form one which is used for parcel identification, but it does not guarantee legal resolution of disputes regarding rights in land;
- Area of each plot and their summation that are registered in format one and in the certificate may not be precise because of the irregularity of the boundaries and inaccurate traditional method of measurement;
- The registration formats that are stored at the Kebele and Wereda levels may be exposed to damage, unless a special care is taken;
- Fragmentation of landholdings is common in the region. This causes inconvenience to the registration process; the registration Form 1 sometimes does not accommodate a large number of parcels.

3.3 Opportunities (for strengthening the rural land registration process)

- The presence of land policy, land administration and use proclamation, both at the Federal and the Regional levels, facilitate the rural land registration process;
- In order for registration of right in land to come in to existence in the region, all parcel-based data that are collected may be considered to be important, as they are used as the basis for any improvement of the system in the future;
- The existence of investment interest in rural land and the sense of land ownership conceived during the inception of the programme, encourage the rural people to participate in the process of registration and certification of right in land;
- The guideline of International Monetary Fund and World Bank on the issue of land tenure enhances the process;
- The interested of non-governmental organizations to support the land administration programme, such as USAID, strengthens the land tenure formalization process.

4. Technical Approaches Used in the Region to Determine the Size (Area) of Parcels

Since cadastral surveys are concerned with geometrical data, including the size of each parcel, efforts are made to introduce some technical approaches to determine the area of each survey plot (parcel) in the region. Some of them are:

- By division of the land parcels into simple geometric figures (introduced and applied)
- Measuring offsets from a baseline (introduced, but not applied)
- Coordinate method (introduced, but not applied) (Annex 1-5).

5. Conclusion and Recommendations

- Since current parcel-based data are used by different institutions such as Bureau of Agriculture and Rural Development, Finance and others, they should reach the required level of quality. Computerization and automation parcel data at Wereda level will be advantageous for ease of maintenance and retrieval of data. Filing cabinet should be available at the Wereda and Kebele levels.
- Current land use and fertility status data of each parcel that is collected through simple field observation is time-consuming and does not give realistic information. It would be better if those data are taken from a larger plot of land, based on scientific investigation.
- Family size data should not be registered in form one, so that form one may accommodate a larger number of parcels and other more important data such as geo-coordinates and parcel identification number.
- Recording parcel data in form two (the book) is routine and its importance is insignificant, since parcel data are recorded in two copies of form1: one for the Kebele level and another one for the Wereda level; it would be better to develop a mechanism to maintain and update registration form one.
- It was thought sufficient if parcels are specified by natural or artificial features of the terrain and if the name of adjacent landholders are recorded, but this alone does not guarantee legal resolution of ownership disputes, so parcel data should be supported with a cadastral map.

Reference

- Dale P., and J. McLaughlin. 1988. Land information management. United Kingdom: Oxford University Press.

Annex 1

Illustrations (for determination of the size of parcels)

The area of any given parcel bounded by irregular straight lines can be divided in to a series of triangles and then computed using any of the following methods. (They are not difficult for Development Agents to use them if they are trained.)

1. Hero's formula which is used to calculate the area of any triangle the lengths of the three sides of which are measured

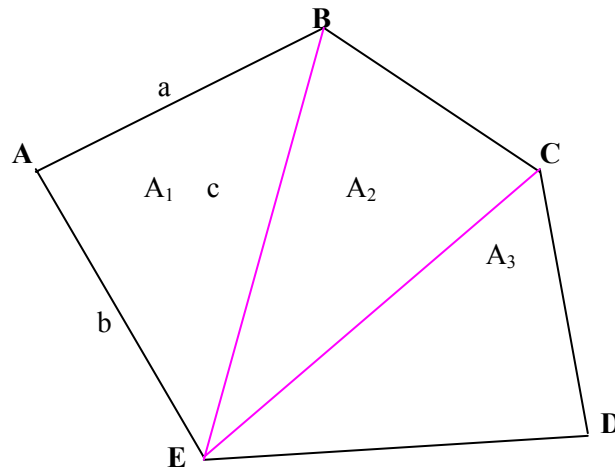
$$\text{Area of } \triangle ABE \text{ in the figure below, } A_1 = \sqrt{s(s-a)(s-b)(s-c)}$$

Where a, b, and c are the three sides of the triangle in Figure ABCDE

$$\text{And } S = \frac{a + b + c}{2} = \text{half-perimeter of the triangle}$$

Area of A_2 and Area of A_3 can be calculated the same way and then

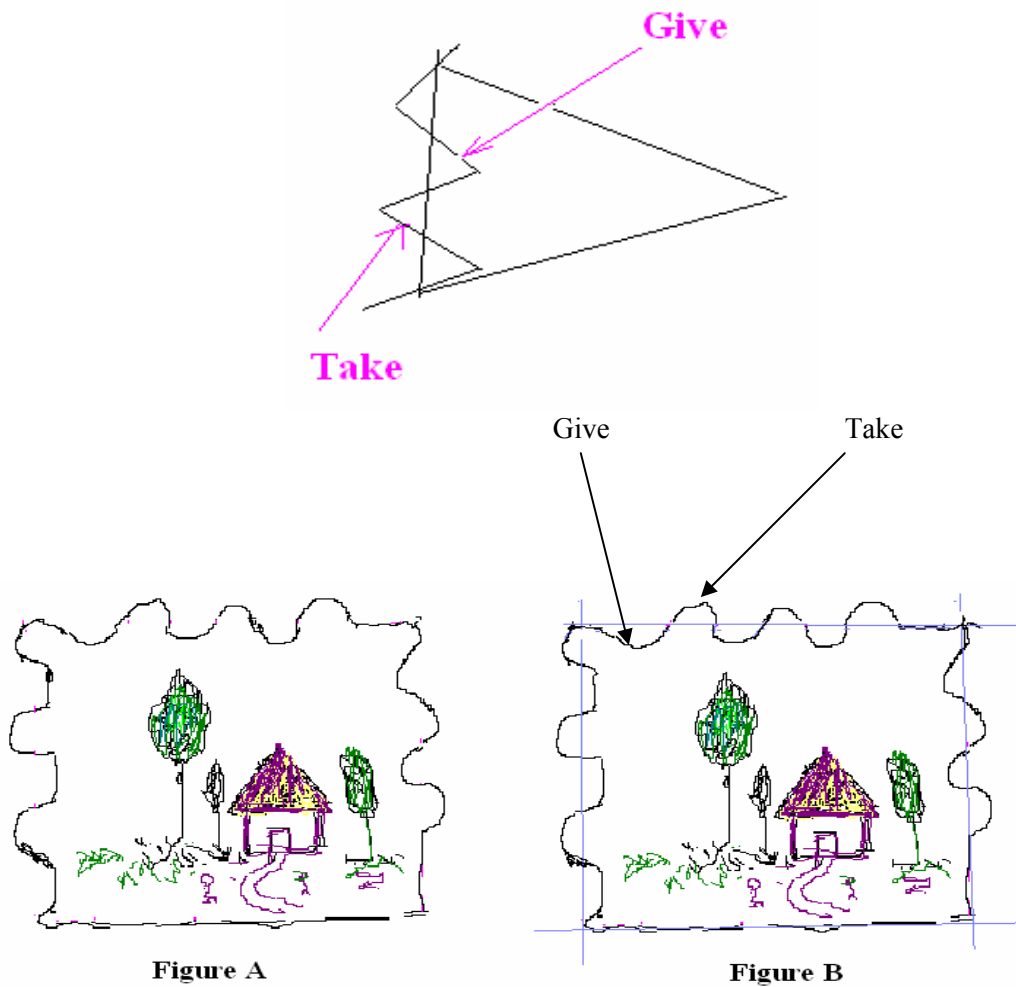
$$\text{Area of Figure ABCDE} = \underline{A_1 + A_2 + A_3}$$



Annex 2

2. If the boundary lines are not straight, a technique known as "give and take" may be applied. (Introduced and applied in the region) (see Fig. 1).

Fig. 1. Give and take in boundaries.

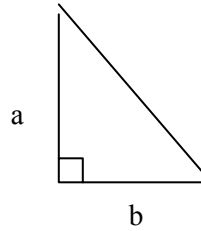


The area enclosed by such zigzag boundaries (fig. A) may be calculated by constructing straight lines upon the boundaries (fig. B) and the area enclosed by the straight lines is taken as the area of the original field.

Annex 3

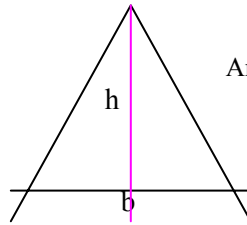
3. Areas of fields with triangular shape may also be computed by simple triangle method.

A.



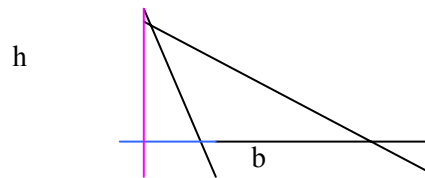
$$\text{Area} = \frac{1}{2} \times a \times b$$

B.



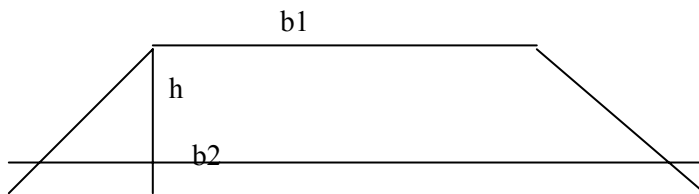
$$\text{Area} = \frac{1}{2} \times b \times h \text{ (For non right angle triangle)}$$

C.



$$\text{Area} = \frac{1}{2} \times b \times h \text{ (For non right angle triangle)}$$

4. Areas of Trapezoidal figures. $A = \frac{b_1 + b_2 \times h}{2}$



Annex 4

5. Area in a closed curve (Introduced, but not applied)

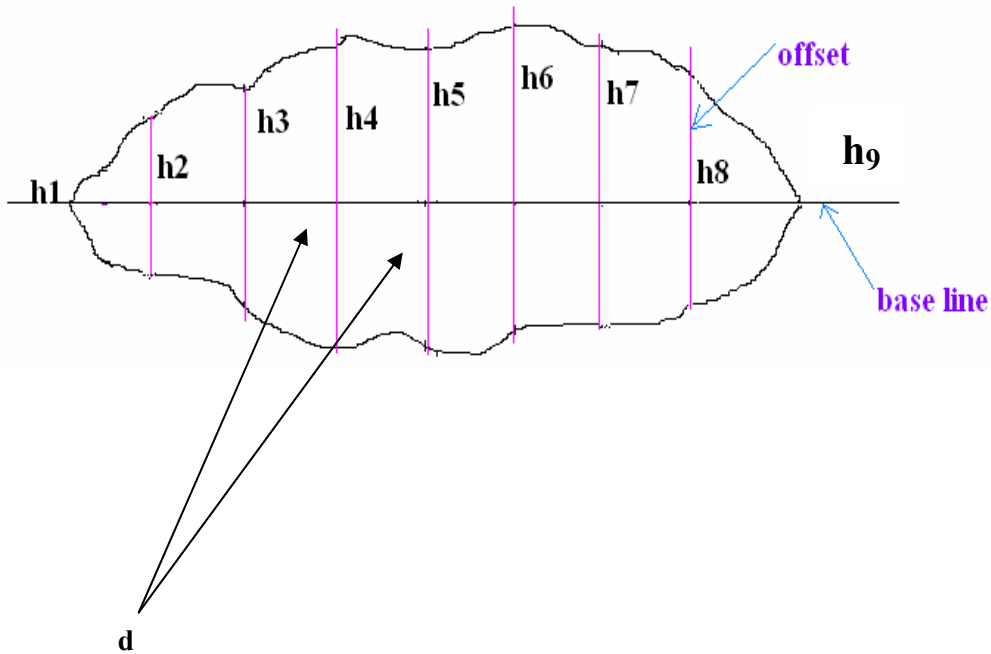


Fig. 2. Area in a closed curve.

To find the area in a closed curve, either trapezoidal rule or Simpson’s 1/3 rule may be applied.

A. The Trapezoidal rule:

$$\text{Area} = 1/2d [h_1+h_n+2 \sum_{i=2}^{n-1} h_i]$$

B. Simpson’s one third rule:

$$\text{Area} = 1/3d [h_1+h_n+2\sum_{(\text{odd})} h_i+4\sum_{(\text{even})} h_i]$$

Where **d** is the interval
 h₁ is the first offset
 and h_n is the last offset

Annex 5

6. The coordinate method (Introduced, but not applied)

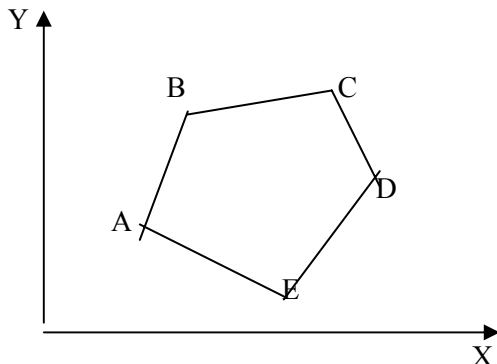
When land properties are in the form of polygons or closed traverses, angle and length measurements can be made in the field. From these field data, the coordinates of the vertices of the closed traverse are calculated as shown below.

The coordinates of the vertices of the closed traverse shown in the figure are:

$$A(X_A, Y_A), B(X_B, Y_B), C(X_C, Y_C), \dots \dots \dots E(X_E, Y_E).$$

A convenient procedure for applying the coordinate method to find the area of the closed traverse is to list the coordinates in the following form:

$$\begin{array}{cccccc} X_A & X_B & X_C & X_D & X_E & X_A \\ Y_A & Y_B & Y_C & Y_D & Y_E & Y_A \end{array} \quad \text{Note that the first vertex is repeated at the end.}$$

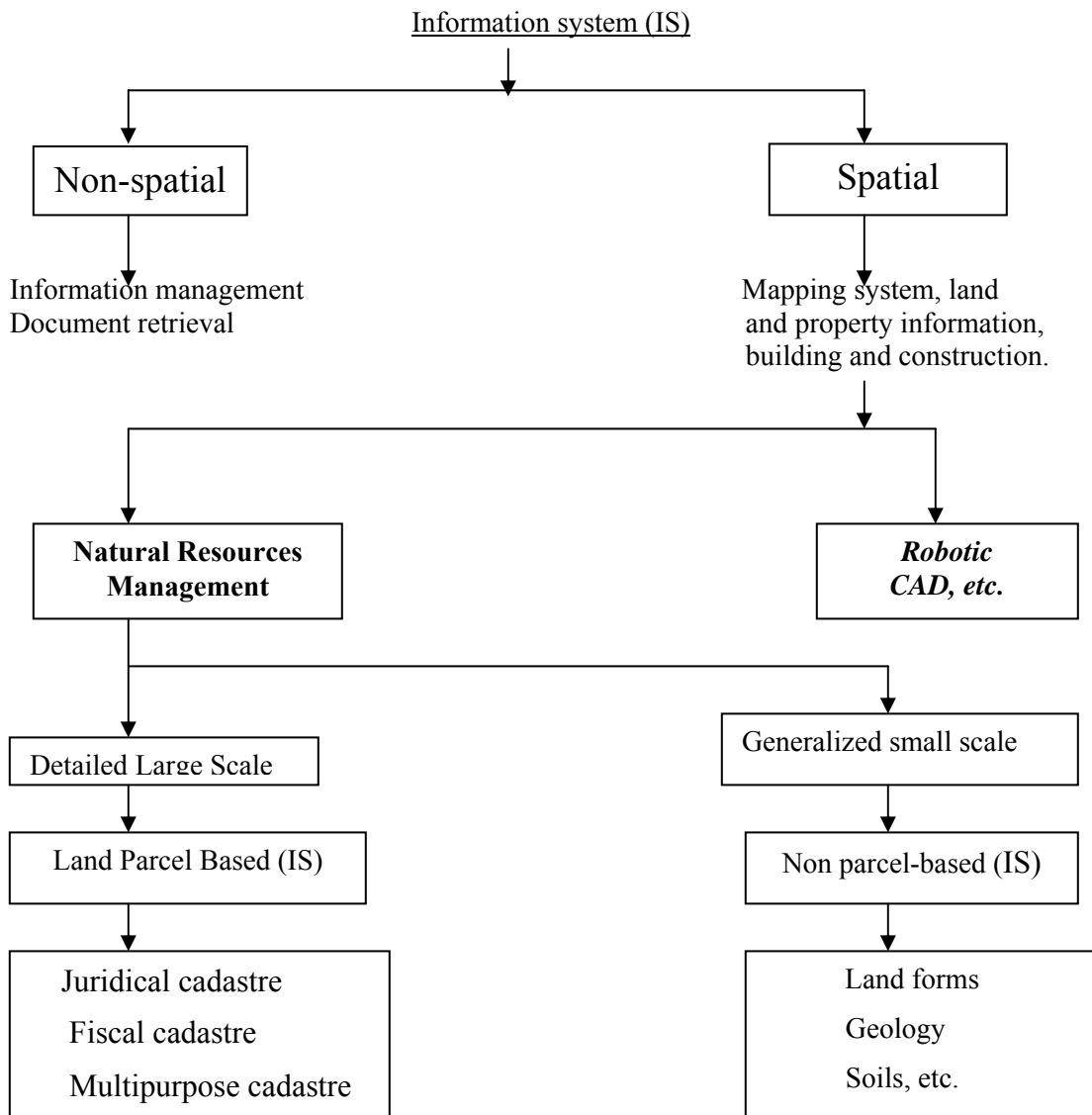


The next step is to find the sum of the products of adjacent diagonal terms taken down - to the right, i.e., $(X_A Y_B, X_B Y_C, X_C Y_D, X_D Y_E \text{ and } X_E Y_A)$ and the sum of the products of all adjacent diagonal terms taken up - to the right, i.e. $(Y_A X_B, Y_B X_C, Y_C X_D, Y_D X_E \text{ and } Y_E X_A)$

The absolute value of the algebraic summation of both products divided by two gives the area of the polygon (traverse). The area may also be calculated using an instrument called Planimeter if the boundaries are plotted on a map.

Annex 6

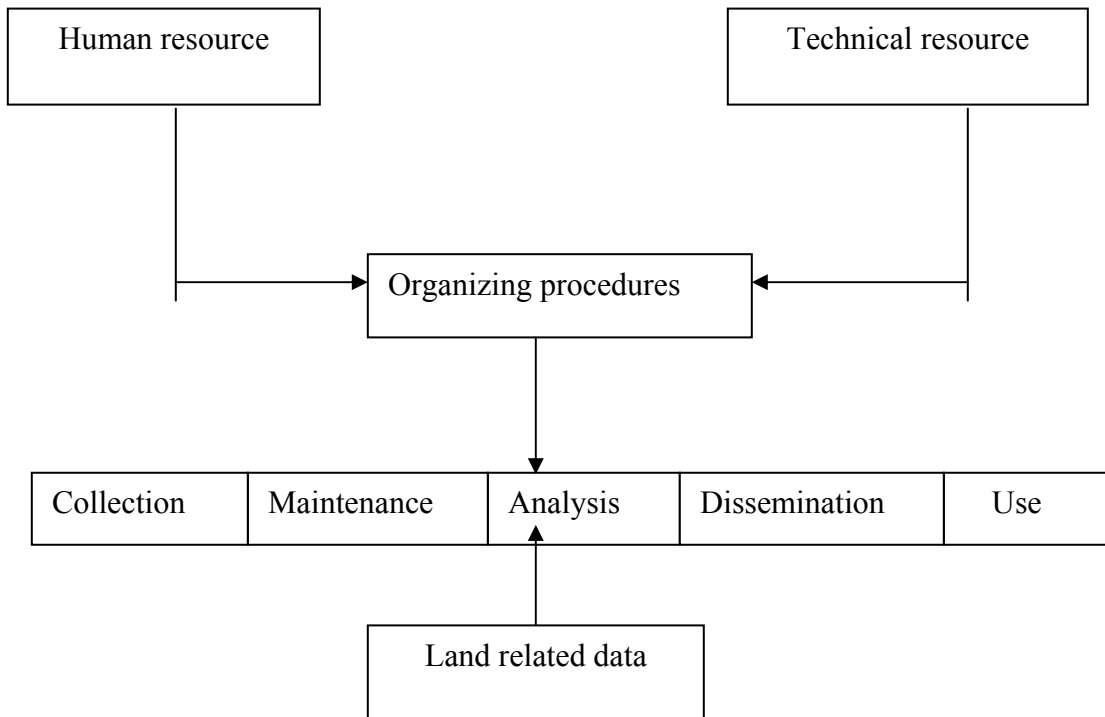
Taxonomy of Land Information System



(Dale and McLaughlin. 1988. Land Administration.)

Annex 7

Components of Land Information System



Land information systems are concerned with detailed information recorded at the local level so that they may be mapped in large scales. They are a subset of general information systems.

(Adopted from P. Dale and J. McLaughlin. 1988. Land Administration.)

Annex 8

Registration Form 1 (used in SNNPR)

Location of the land holding: Zone----- Wereda----- Kebele-----

Sub-kebele: 1.----- 2.----- 3.----- 4.----- 5. -----

No.	Name of the land holder	No. of land holding	Area of land holding(ha)	Name of farmers sharing the boundaries				Current land use	Fertility status		
				North	South	East	West		Fertile	Medium	Poor soil
1.	Name----- Sex----- Age-----	1.									
2.	Name ----- Sex----- Age-----	2.									
3.	Guardian's name - ----- Sex----- Age-----	3.									
----	-----	4.									
----	-----	5.									
----	-----	Sum	----(ha)	-----							

2. Name-----Signature-----Date-----

STAMP

Name of the chairman of Kebele Land A/Committee Name----- Signature----- Date-----