

The development of a GIS for an informal settlement

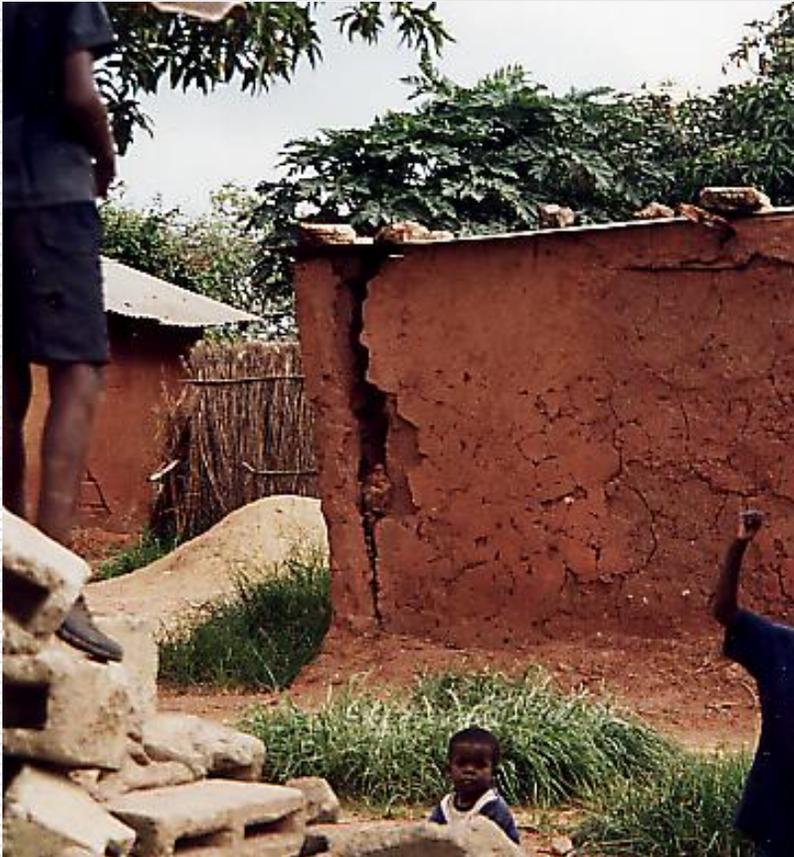
**Paper presented by Benita Nordin at
Expert Group Meeting on secure land tenure:
'new legal framework and tools'
UN-Gigiri in Nairobi, 10-12 November 2004**

The aim of the presentation

is to try to show examples of the use of GIS as one of the tools for solving land related problems in informal settlements.

It focuses on GIS in relation to regularisation of informal settlements in order to provide secure tenure.

Informal settlements

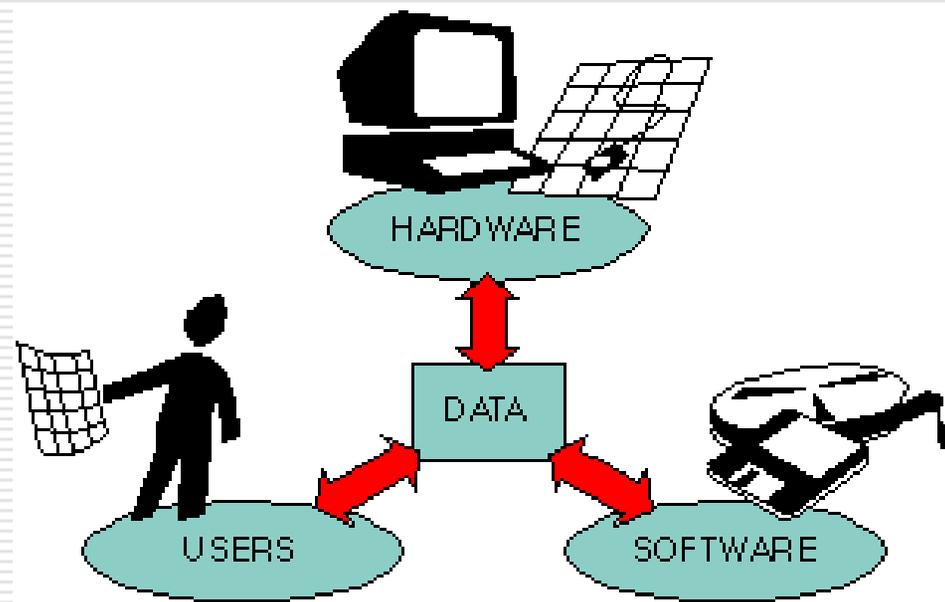


may be defined as:

"dense settlements comprising communities housed in self-constructed shelters under condition of informal or traditional land tenure"

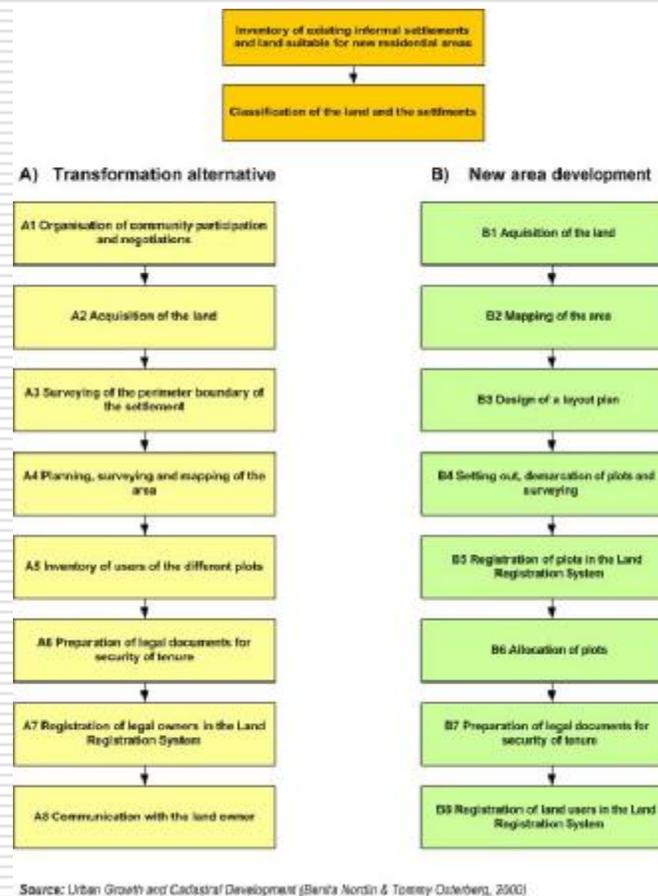
(Hindson and McCarthy, 1994)

GIS



Source: Lloyd P. Queen and Charles R. Blinn, *The basics of Geographic Information Systems*

Working model for the introduction of a cadastral system in cities with informal settlements



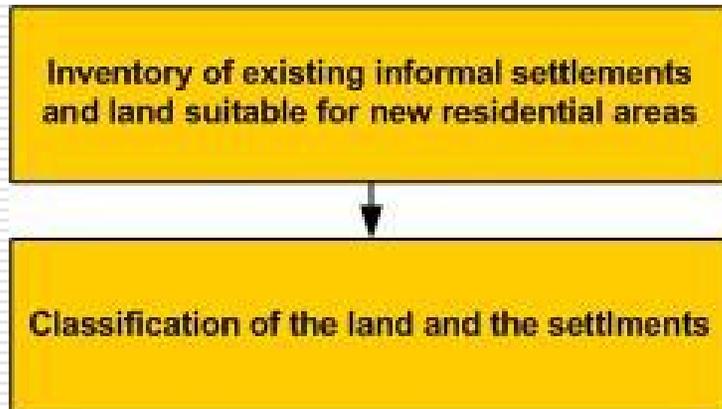
A) Transformation alternative

mainly include establishment of a cadastral system for transformation of informal tenure into formalized tenure

B) New area development

include establishment of a cadastre in connection with the development of an area for a new settlement

Working model for the introduction of a cadastral system in cities with informal settlements



1. The initial inventory is particularly important in urban areas where land shortage is a major problem
2. Classification into:
 - Settlements where land tenure can be formalised
 - Settlements not suitable for transfer to formal tenure
 - Land suitable for new settlements

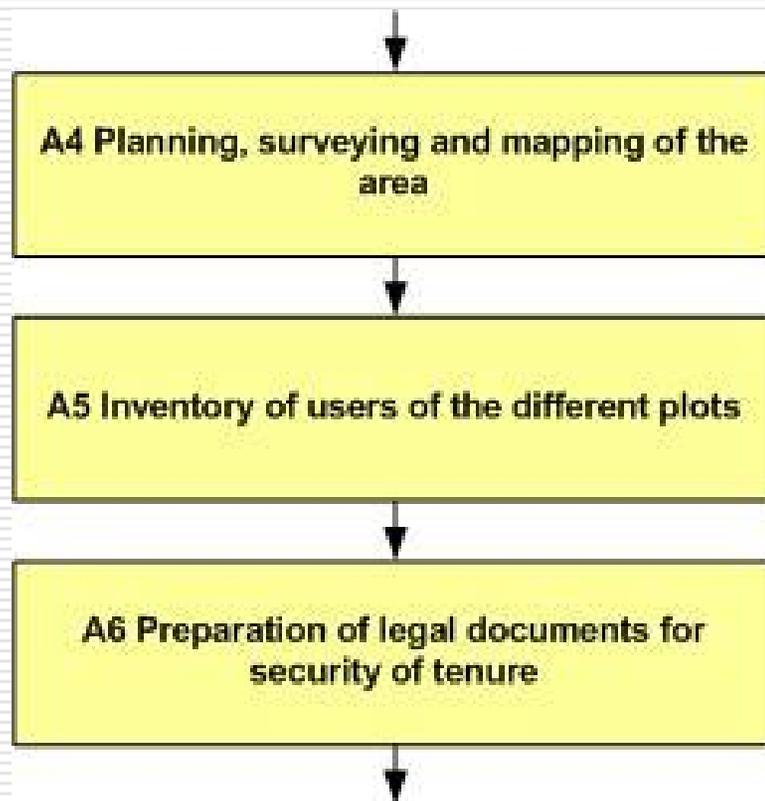
1. GIS for initial inventory

- boundaries of the settlement and areas suitable for new settlement, main characteristics, land ownership and service

or

- detailed inventory collecting information from door to door depending on the situation

2. GIS for inventory for formalising land tenure



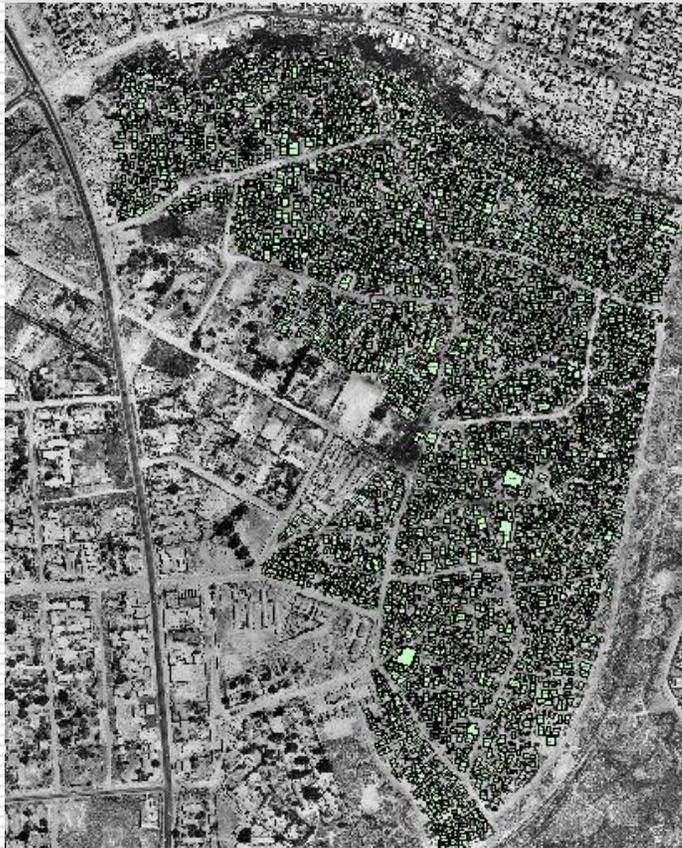
- Mainly include establishment of a cadastral system for transformation of informal tenure into formalized tenure

See Chaisa example

3. GIS for inventory for resettlement

- Areas not suitable for transfer to formal tenure, for example:
 - n Settlement located in an area which is dangerous or designated for other use, such as industry
 - n Areas which have to be evicted for example along railway lines or main roads
- ➔ **Detailed information of beneficiaries**

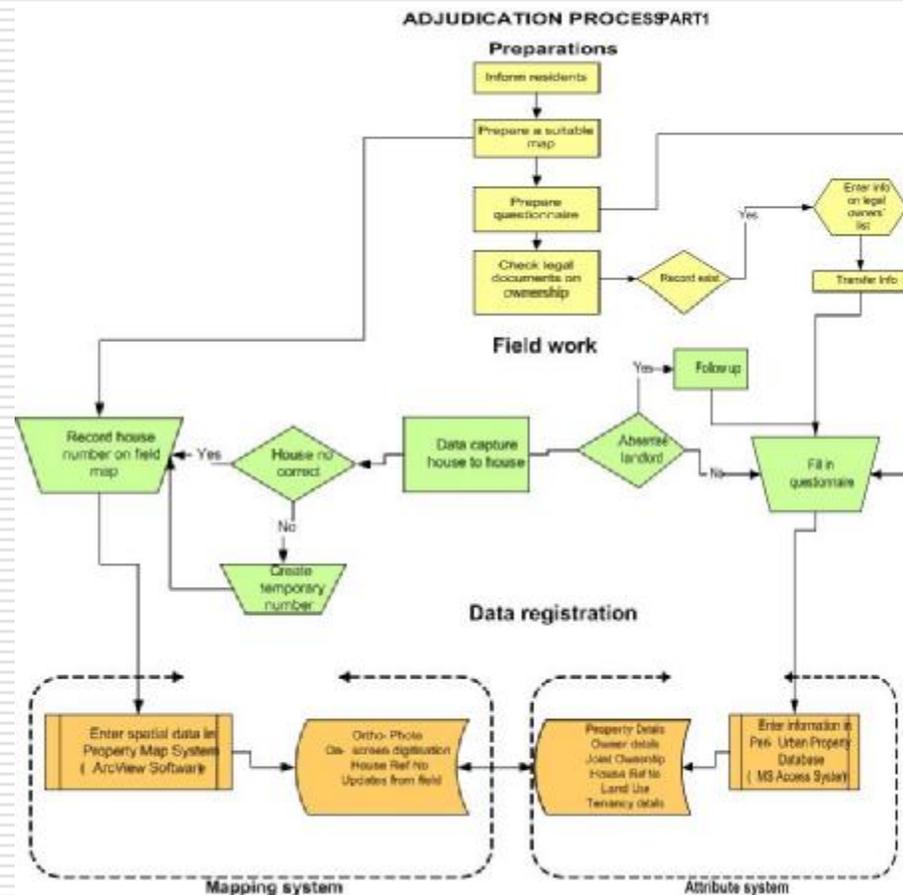
Urban Land Management Project in Lusaka (2000-2003)



Chaisa pilot area

- 33,000 inh.
- Declared Improvement Area in 1987
- Resident Development Committes (RDC)
- 10% had Occupancy Licenses

Adjudication process part 1 in Chaisa



Adjudication process

- **Adjudication** is the process of investigating the existing ownership of land
- **Steps Taken:**
 - n Preparation
 - n Field work
 - n Data registration



Adjudication Process (1)

- Preparation
 - n Inform residents
 - n Prepare suitable map
 - n Prepare questionnaire
 - n Check existing legal documents on ownership



Process of Adjudication (2)

- Field work
 - n Data capture by house to house visitations
 - n Questionnaires used for attribute data
 - Zone, Block and House number
 - Land use
 - Number of units
 - Condition of structure
 - Owner details (name, sex, NRC, marital status)
 - Household size
 - Occupancy licence number
 - Willingness for joint ownership
 - n Spatial data, i.e. house numbers, entered on paper map

Field Team Composition

- Core field team composed of:
 - n One person reading map
 - n One person entering attribute data
 - n One person from the community

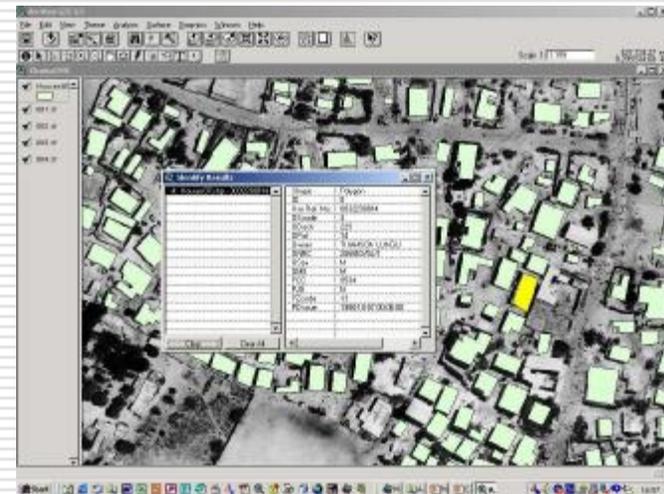
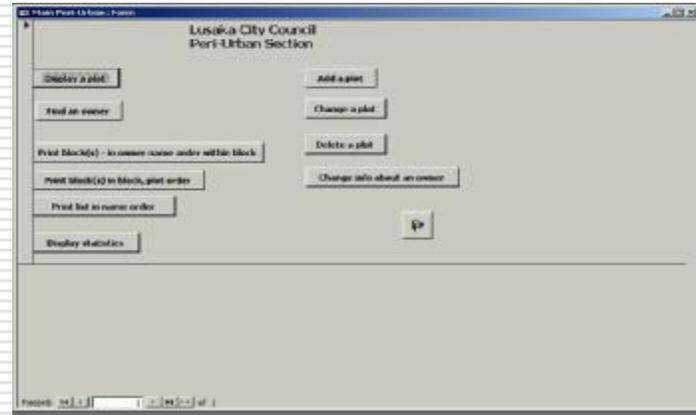


Working schedule

- Field work in the mornings
- Data registration in the afternoon
- Same officer captures and registers data

Process of Adjudication (3)

- Data Registration
 - n Attribute data entered in the Peri - Urban Property Database
 - Owner details,
 - Zone, Block & House number
 - Land use
 - Occupancy licence number
 - n Spatial data entered in the Chaisa Property Map
 - 10 digit House Reference Number. e.g. 0031800025



ArcView GIS 3.2

File Edit Table Field Window Help

1 of 2633 selected

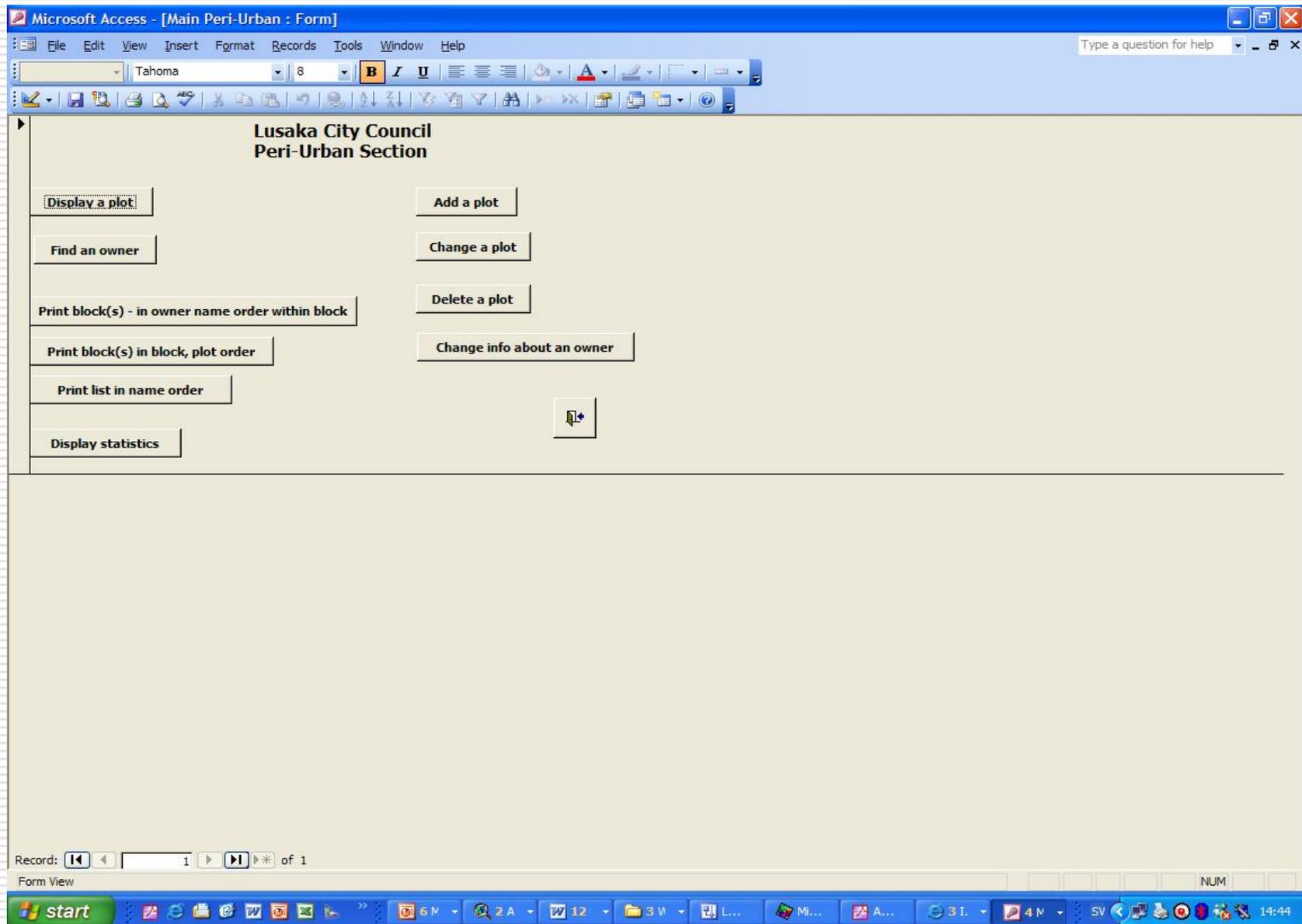
Chaisa Map

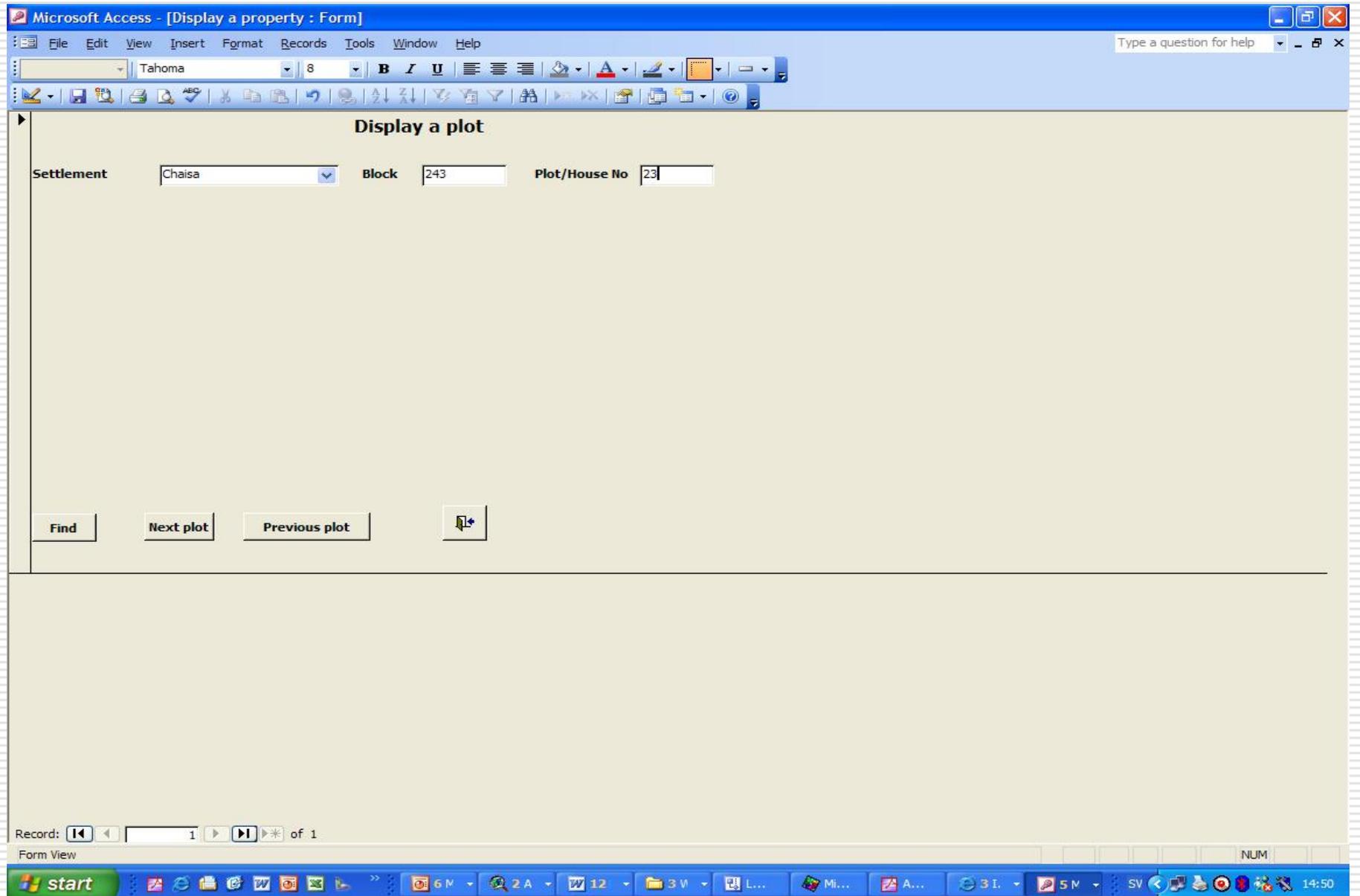
Houses97.shp
 001.ecw
 002.ecw
 003.ecw
 004.ecw

Attributes of Houses97.shp

Block_plot	Owner Name	NRC	Sex	D/L Number	Landuse
246/53	Francis Kalonga	129731/67/1	M	9342	Commercial
165/14	Kaliam Kangwa	119372/46/1	M	7438	Special Residencia
165/4	Dickson Lewanika (deceased)	001234/11/1	M		Residential
165/9	Phiri Salatiyeho (deceased)	003492/11/1	M		Special Residencia
165/20	Richard Simonda	103330/11/1	M	9288	Special Residencia
165/19	Mwanza Nakawale Josephine	157150/47/1	F	8422	Special Residencia
166/14	Baldwin Phiri	161482/52/1	M		Special Residencia
166/13	Phiri Lukhele	208438/52/1	M	11854	Special Residencia
166/2	Rhoda Malindi	203739/82/1	F	7586	Special Residencia
166/1	Geofrey Njovu	130090/71/1	M	9366	Special Residencia
166/9	Nkhoma Saulos (deceased)	109787/16/1	M	9421	Special Residencia
166/10	Edward Sinkala	595887/11/1	M	10680	Special Residencia
166/16	Sinkonde Silkali	227951/11/1	M		Special Residencia
165/22	Lembani Phiri	224447/11/1	M		Special Residencia
166/7	Lungu Lameck	182192/52/1	M		Special Residencia
171/27	Zulu Mailesi	112313/53/1	F	12587	Special Residencia
170/22	Zulu Joseph	181534/53/1	M		Residential
170/8	Chiaqewe Champion	900182/62/2	M	7864	Special Residencia

start 6M 2A 12 3V L... Mi... A... 3I 2M SV 14:40





Microsoft Access - [Display a property : Form]

File Edit View Insert Format Records Tools Window Help

Tahoma 8 B I U

Type a question for help

Display a plot

Settlement Chaisa Block 243 Plot/House No 23

Type of tenancy Occupancy license Occupancy/Title No. 10269 Date of registration 1988-04-28

Joint ownership (Y/N) N

Owner(s)

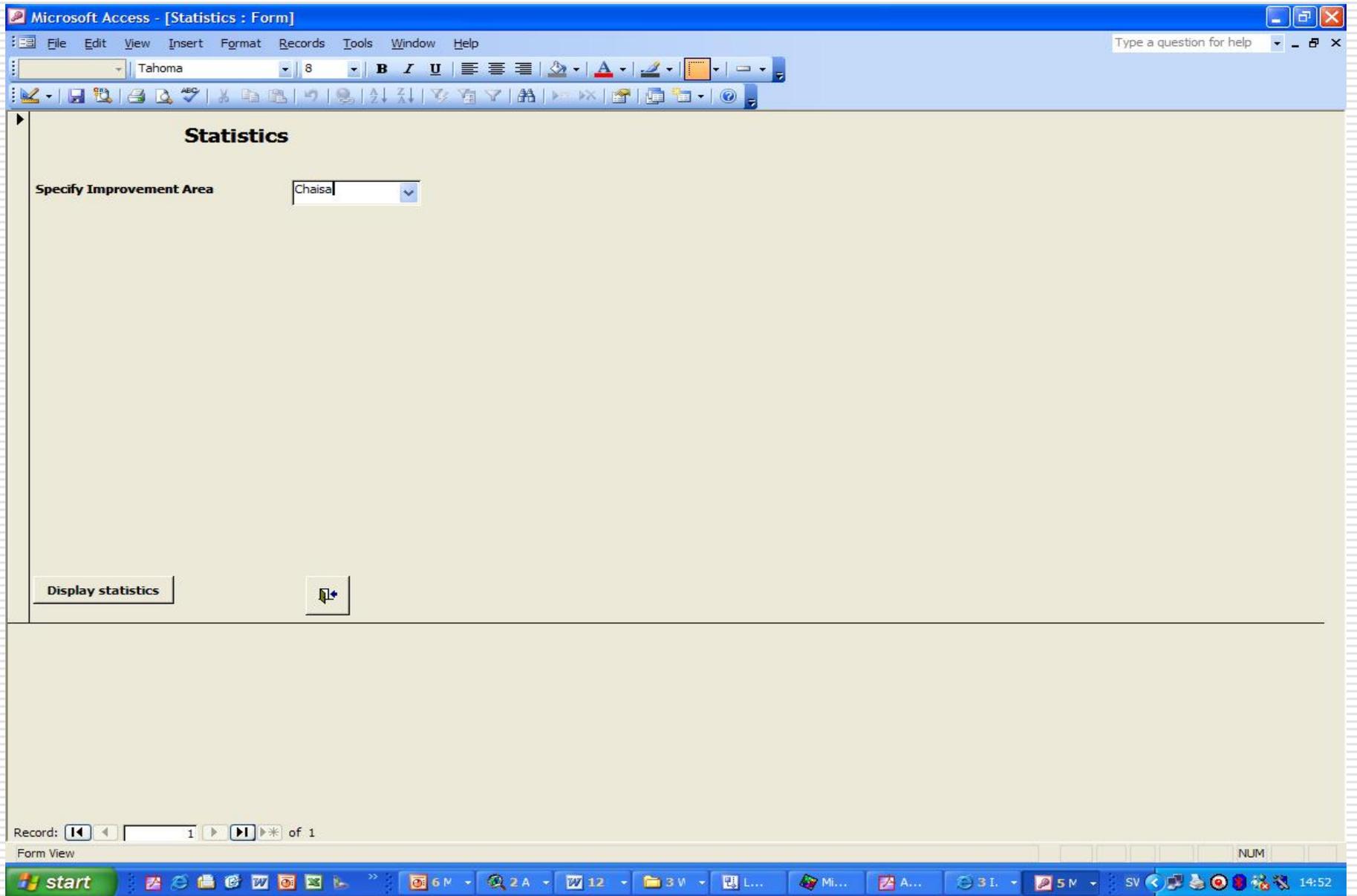
Name	Sex	Marital status	National Registration Card No.
Zulu Edward	M	M	223055/11/1

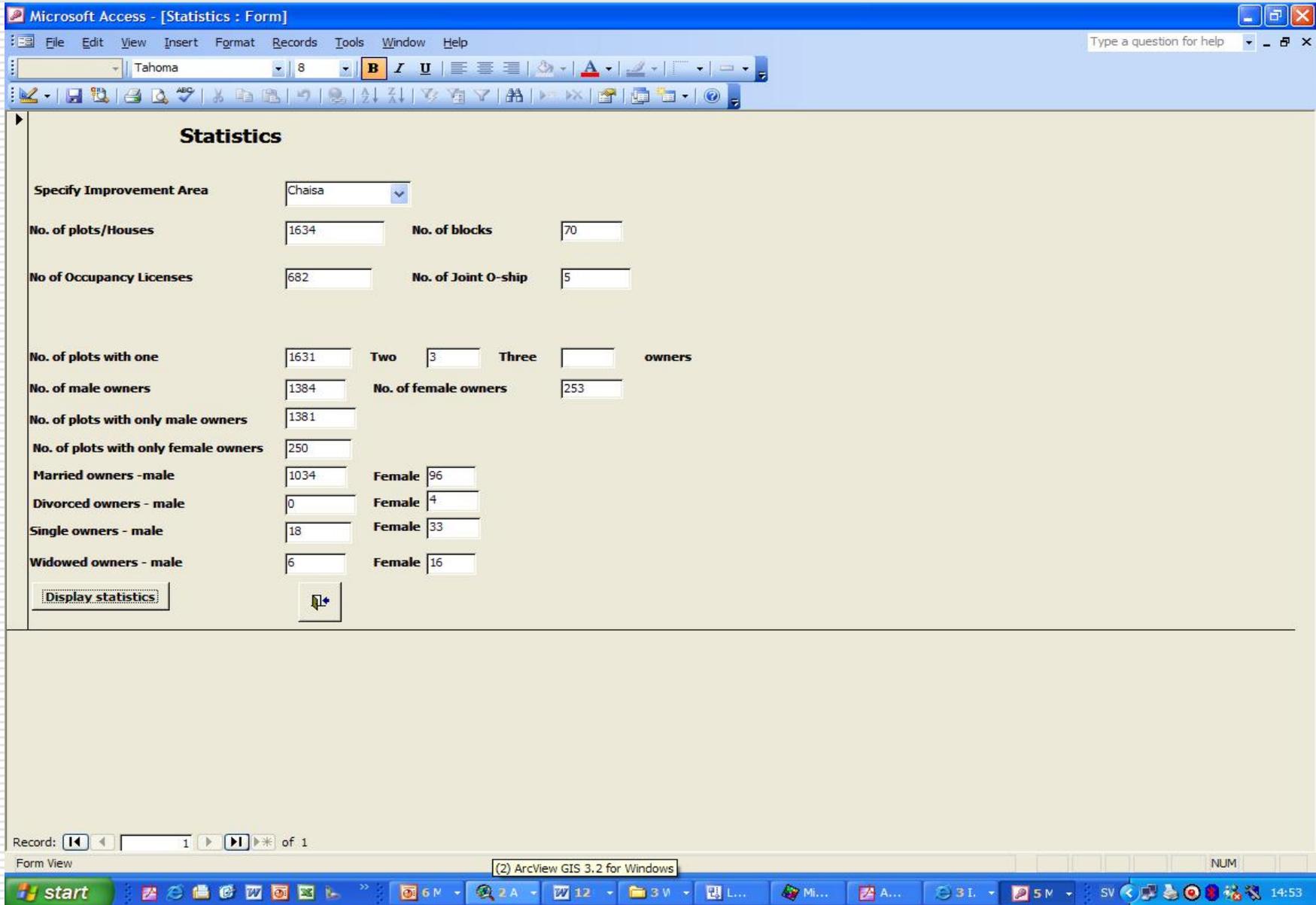
Find Next plot Previous plot

Record: 1 of 1

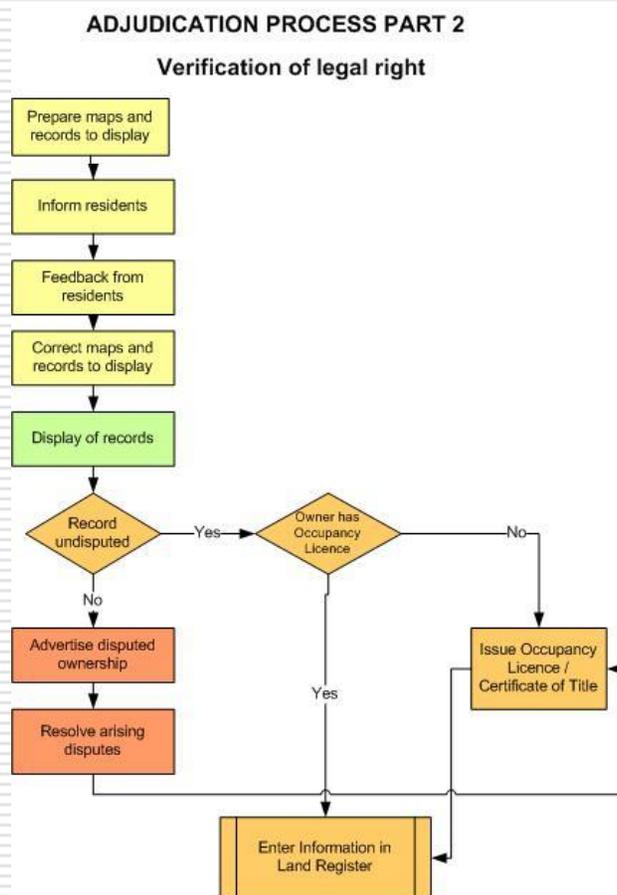
Form View NUM

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Adjudication part 2



- The second part of the adjudication process could not be completed due to lack of legal status

Adjudication part 2

○ Display of Records

- n Inform residents about final list of ownership
- n Display for period of time
- n Get feedback from residents
- n Resolve arising queries

○ Approval of Records

- n Update records
- n Final decision on ownership
- n Legal status of records

Lack of spatial data



- Orthophotos or satellite images basic source
- Fairly new images
- Verification on the ground

Unique identifiers for geo-reference

Settlement name	Block number	Plot/House number	Unique identification
Chaisa	242	11	0032420011
Chaisa	242	11B	0032420011B

Lack of attribute data

- Information need to be collected using questionnaires



Unique identifiers of occupiers

- Information of owner and tenant
- All members of the household
 - n ID Card No
 - n Photo
 - n Relation to another person
 - n Thumbprint
 - n Counter in the system

Person identification information		
Surname First name (Middle name)	National Registration Card (NRC) No	Sex
Phiri David	218679/11	M

Quality of the data

- Clear questions
- Coded answers
- Data collection exercise dependent on the cooperation of the residents
- Awareness campaigns
- Verification process necessary

Distance to work place?			
*	Less than 1 km	*	More than 5 km
*	1 km – 3 km	*	I work here
*	3 km – 5 km		

Source: Enumeration form from Pamoja Trust

Data conversion exercise

- Don't underestimate the size of the data conversion exercise

- n Make estimates based on experience

Example from Lusaka:

- No of houses: 140,000

- 6 teams needed to finish within 4 years

Processes of requiring security of tenure need to be changed

- n** Move away from applicant driven and cumbersome processes
- n** Decentralize processes
- n** Harmonize legislation and processes
- n** System development should include development of the processes
- n** Include a process for keeping the records up-to-date

GIS for informal settlements – part of the formal system

The aim of the development of GIS for the purpose of land management in informal settlement should be to make it part of the formal land management system. For development purposes it might be necessary to develop pilot systems and carry out pilot projects, but it is important for the development of the urban areas in cities in developing countries that the areas with informal land tenure is brought into the formal land management system.