The development of a GIS for an informal settlement

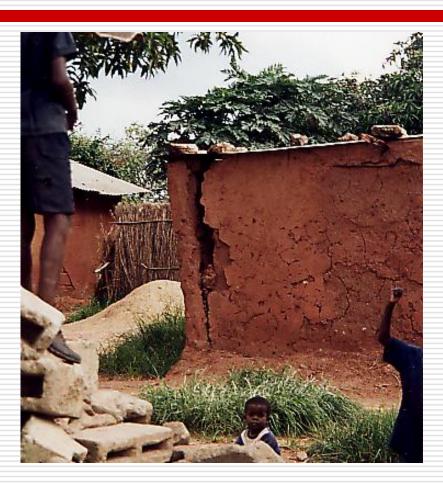
Paper presented by Benita Nordin at Expert Group Meeting on secure land tenure: 'new legal framework and tools' UN-Gigiri in Nairobi, 10-12 November 2004

### 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

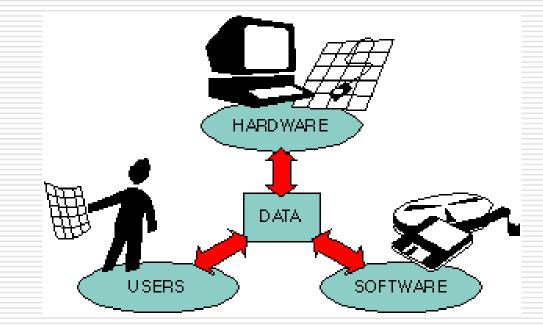


#### may be defined as:

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

(Hindson and McCarthy, 1994)

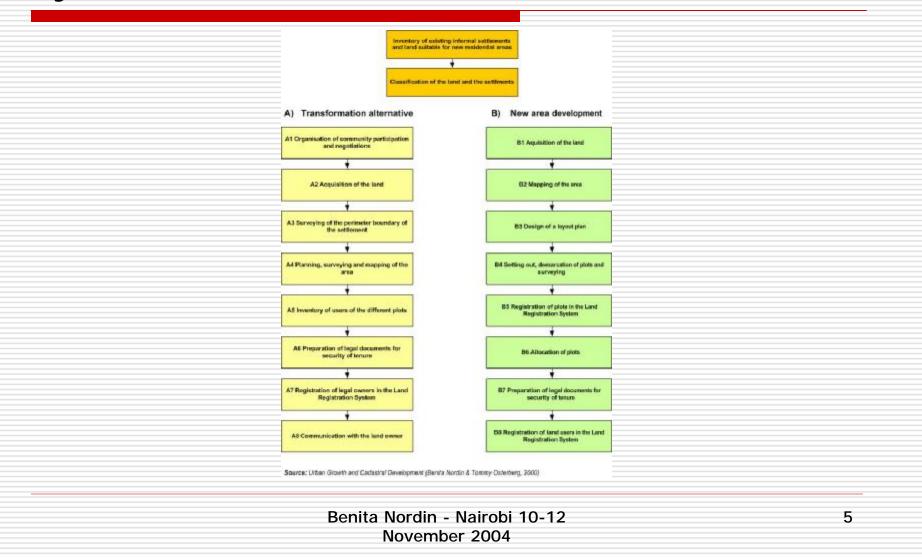
### GIS



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

Benita Nordin - Nairobi 10-12 November 2004 4

## 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

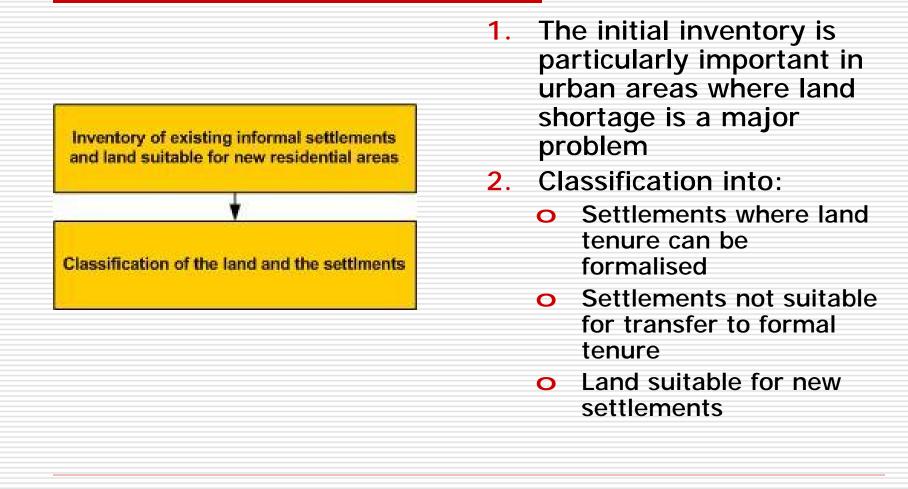
### B) New area development

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

> Benita Nordin - Nairobi 10-12 November 2004

7

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



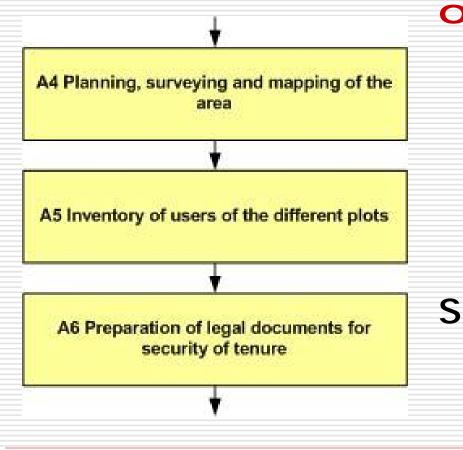
### 1. GIS for initial inventory

 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

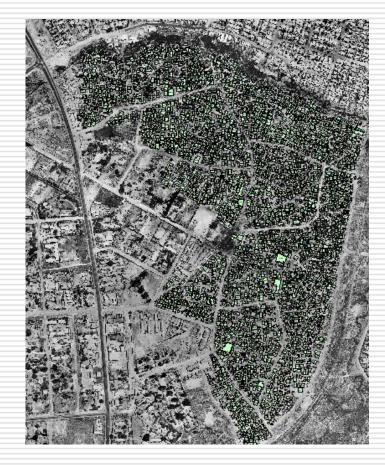


 Mainly include establishment of a cadastral system for transformation of informal tenure into formalized tenure
 See Chaisa example

### 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

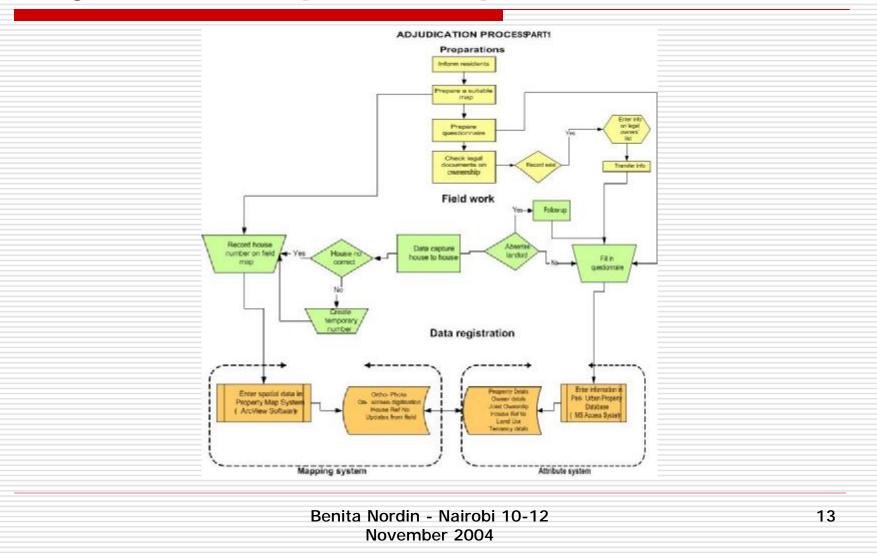
# Urban Land Management Project in Lusaka (2000-2003)



#### Chaisa pilot area

- o 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)

### o 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
  - o 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**

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



### Working schedule

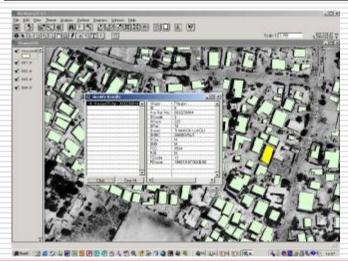
Field work in the mornings
 Data registration in the afternoon
 Same officer captures and registers data

### Process of Adjudication (3)

#### Data Registration

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

ED Plan Port Alban : Form	1 M M
Lusaka City Council  Peri-Urban Section	
Objective a plot      And a spect        Tend at reveer      Change a plot        Priot Mach(q) - in invester schere ander within: Mack      Delete a plot        Prest Mach(q) in Mech, spect order      Change schere	
Pract last in rearese confer Display statistics	
Taxast attain a material at a	



Chaisa Map								
	D/0/11							
	249/1		C F E					and the second s
A 201		246/20	46/1 246/10	2	46/4 5 6/18 144/	17 044/44	44/2	227/21
✓ 001.ecw	49/3	26120	un france	16/4		244/14	24	4/1
✓ 002.ecw	49/10		46/9	10/40				
✓ 003.ecw	Ser - Anna -		1 DP		<b>246/2</b>	2 4/	1 1 1 2 -	L stin anti-
and the second		246/22		1 1 1	44	/16 214/1		A CONTRACTOR
✓ 004.ecw	249/9249/4	2 6/22	246	/53B	6/3			and the second second second
		210122	1427	27			and the second	00707
	49/5	a hat					A Carlos Carlos	237/27
	49/8	246/	/53	and the put		and a		-
	3-20	246/23	1-1-1	-			S Salary	237/16
	140/603	et a ser a s			20/405	1238/2	438/21 42/14	
	49/09/	A Subalan alt	1.2.4	-	30/10	- Yes		23/1/
			E	and a	238	14 14	b37/17	37/14
	R Attr	ibutes of Houses97.shp			_ [			
	Black p		NRC	Sex D	/L Number Landu	//27	125 712	237/86 2
							1. A.	The life
	246/53	Francis Kalonga Kaliam Kangwa	129731/67/1 119372/46/1	M M	9342 Commercial 7438 Special Reside		Frank Part	37/1B
	165/4	Dickson Lewanika (deceased		M	Residential		237/19	
	165/9	Phiri Salatiyeho (deceased)	003492/11/1	M	Special Resid	entia	CT while a	237/9
								110 23
	165/20	Richard Simonda	103330/11/1	M	9288 Special Reside	entia 1//23	7/20 23/	114
	1CE/19	Richard Simonda Mwanza Nakawale Josephin		F	9288 Special Resid 8422 Special Resid		7/20 23/	Le Terre
		Mwanza Nakawale Josephin Baldwin Phiri	e 157150/47/1 161482/52/1	F	8422 Special Resid Special Resid	entia entia	7/20 23/	1
	20, <sup>74</sup> 3/21) 165/19 166/14 166/13	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele	e 157150/47/1 161482/52/1 208438/52/1	F M M	8422 Special Resid Special Resid 11854 Special Resid	entia entia entia	37/2	2 21/0 35/
	20 43/21 165/19 166/14 166/13 166/2	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele Rhoda Malindi	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1	F M M F	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid	entia entia entia entia	37/2 37/2 237/11	
	20,43/21) 166/14 166/13 166/2 166/1	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele Rhoda Malindi Geofrey Njovu	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1	F M M F M	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid 9366 Special Resid	entia entia entia entia entia	7/20 23/ 37/2 237/11	The say
	20 43/21) 165/13 166/14 166/13 166/2 166/1 166/9	Mwanza Nakawale Josephin Baldwin Phri Phiri Lukhele Rhoda Malindi Geofrey Njovu Nkhoma Saulos (deceased)	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1	F M F M M M	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid 9366 Special Resid 9421 Special Resid	entia entia entia entia entia	37/2 37/2 39/3	
	20 43/21) 165/19 166/14 166/1 166/2 166/1 166/9 166/10	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele Rhoda Malindi Geofrey Njovu Nkhoma Saulos (deceased) Edward Sinkala	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1 595887/11/1	F M F M M M M	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid 9366 Special Resid 9421 Special Resid 10680 Special Resid	entia entia entia entia entia entia entia	7/20 37/2 237/11 39/3	210
	20 43/21) 165/19 166/14 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/2 166/1 166	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele Rhoda Malindi Geofrey Njovu Nkhoma Saulos (deceased) Edward Sinkala Sinkonde Silikali	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1 595887/11/1 227951/11/1	F M F M M M M	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid 9366 Special Resid 9421 Special Resid 10680 Special Resid Special Resid	entia entia entia entia entia entia entia entia entia	7/20 23/ 37/2 237/11 39/3 239/2	
	20 43/21) 165/19 166/14 166/1 166/2 166/1 166/9 166/10	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele Rhoda Malindi Geofrey Njovu Nkhoma Saulos (deceased) Edward Sinkala	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1 595887/11/1	F M F M M M M	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid 9366 Special Resid 9421 Special Resid 10680 Special Resid	entia entia entia entia entia entia entia entia entia entia	1/20 23/ 37/2 237/11 39/3 239/2 39/	27/10 357
	2043/21) 165/19 166/14 166/13 166/2 166/1 166/9 166/9 166/9 166/16 166/16 165/22	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele Rhoda Malindi Geofrey Njovu Nkhoma Saulos (deceased) Edward Sinkala Sinkonde Silikali Lembani Phiri	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1 595887/11/1 227951/11/1 227951/11/1	F M F M M M M M M	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid 9366 Special Resid 9421 Special Resid 10680 Special Resid Special Resid Special Resid	entia entia entia entia entia entia entia entia entia entia entia	1/20 23/ 37/2 237/11 39/3 239/7 39/	27/10 357
	2043/21 165/13 166/14 166/13 166/2 166/1 166/2 166/1 166/3 166/10 166/1 166/1 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/2 166/1 166/2 172/2 170/22	Mwanza Nakawale Josephin      Baldwin Phiri      Phiri Lukhele      Rhoda Malindi      Geofrey Njovu      Nkhoma Saulos (deceased)      Edward Sinkala      Sinkonde Silikali      Lembani Phiri      Lungu Lameck      Zulu Mailesi      Zulu Joseph	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1 595887/11/1 227951/11/1 227951/11/1 182192/52/1 112313/53/1 181534/53/1	F M M M M M M M F F M	8422 Special Resid Special Resid 11854 Special Resid 9366 Special Resid 9421 Special Resid 10680 Special Resid Special Resid Special Resid Special Resid Special Resid Residential	entia entia	1/20 37/2 237/11 39/3 239/7 39/7 39/8 39/8	27/10 35/2
	2043/21 165/13 166/14 166/13 166/2 166/2 166/2 166/1 166/3 166/1 166/1 166/2 166/1 166/2 17/27 17/27	Mwanza Nakawale Josephin Baldwin Phri Phiri Lukhele Rhoda Malindi Geofrey Njovu Nkhoma Saulos (deceased) Edward Sinkala Sinkonde Silikali Lembani Phiri Lungu Lameck Zulu Mailesi	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1 595887/11/1 227951/11/1 227951/11/1 182192/52/1 112313/53/1	F M M M M M M M M F	8422 Special Resid Special Resid 7586 Special Resid 9366 Special Resid 9421 Special Resid 10680 Special Resid Special Resid Special Resid Special Resid 2587 Special Resid	entia entia	7/20 237 37/2 237/11 39/3 239/7 39/8 2	27/10 35/ 25/ 4 239/5 239/6 235/22
	2043/21) 165/19 166/14 166/3 166/2 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/2 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 170/22 170/2 170/8 1	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele Rhoda Malindi Geofrey Njovu Nkhoma Saulos (deceased) Edward Sinkala Sinkonde Silikali Lembani Phiri Lungu Lameck Zulu Mailesi Zulu Joseph Chiqaewe Champion	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1 595887/11/1 227951/11/1 227951/11/1 182192/52/1 112313/53/1 181534/53/1	F M M M M M M M F F M	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid 9366 Special Resid 9421 Special Resid 10680 Special Resid Special Resid Special Resid 12587 Special Resid Residential	entia entia	7/20 23/ 37/2 237/11 39/3 239/7 39/8 2	27/10 35/2 2 5/2 2 39/5 2 39/6 2 35/22 2
	2043/21 165/13 166/14 166/13 166/2 166/1 166/2 166/1 166/3 166/10 166/1 166/1 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/2 166/1 166/2 172/2 170/22	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele Rhoda Malindi Geofrey Njovu Nkhoma Saulos (deceased) Edward Sinkala Sinkonde Silikali Lembani Phiri Lungu Lameck Zulu Mailesi Zulu Joseph Chiqaewe Champion	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1 595887/11/1 227951/11/1 227951/11/1 182192/52/1 112313/53/1 181534/53/1	F M M M M M M M F F M	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid 9366 Special Resid 9421 Special Resid 10680 Special Resid Special Resid Special Resid 12587 Special Resid Residential	entia entia	7/20 23/ 37/2 237/11 39/3 239/2 39/7 39/8 2	27/10 35/2 239/5 239/6 235/22 2
	2043/21) 165/19 166/14 166/3 166/2 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/2 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 170/22 170/2 170/8 1	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele Rhoda Malindi Geofrey Njovu Nkhoma Saulos (deceased) Edward Sinkala Sinkonde Silikali Lembani Phiri Lungu Lameck Zulu Mailesi Zulu Joseph Chiqaewe Champion	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1 595887/11/1 227951/11/1 227951/11/1 182792/52/1 112313/53/1 181534/53/1 900182/52/2	F M M M M M M F F M M	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid 9366 Special Resid 9421 Special Resid 10680 Special Resid Special Resid Special Resid 12587 Special Resid Residential	entia entia	7/20 23/ 37/2 237/11 39/3 239/2 39/7 39/8 2	27/10 35/2 239/5 239/6 235/22 2
	2043/21) 165/19 166/14 166/3 166/2 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/1 166/2 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/1 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 166/2 170/22 170/2 170/8 1	Mwanza Nakawale Josephin Baldwin Phiri Phiri Lukhele Rhoda Malindi Geofrey Njovu Nkhoma Saulos (deceased) Edward Sinkala Sinkonde Silikali Lembani Phiri Lungu Lameck Zulu Mailesi Zulu Joseph Chiqaewe Champion	e 157150/47/1 161482/52/1 208438/52/1 203739/82/1 130090/71/1 109787/16/1 595887/11/1 227951/11/1 227951/11/1 182192/52/1 112313/53/1 181534/53/1	F M M M M M M F F M M	8422 Special Resid Special Resid 11854 Special Resid 7586 Special Resid 9366 Special Resid 9421 Special Resid 10680 Special Resid Special Resid Special Resid 12587 Special Resid Residential	entia entia	7/20 23/ 37/2 237/11 39/3 239/7 39/7 39/8 2	27/10 35/2 25/2 239/6 235/22 2

Benita Nordin - Nairobi 10-12 November 2004 20

	Microsoft Access - [Main Peri-Urban : Form]		
 i EE	Eile Edit View Insert Format Records Tools Window Help	Type a question for help 🚽 🗕 🗗 🗙	
 1	▼ Tahoma ・ 8 ・ B I U 三 三 三 二 △ ・ ▲ ・ 2 ・ 「 ・ □ ・ 」		
 :	<+   ⊒ <sup>1</sup> 2,   ⊴ 12, <sup>10</sup>   3 <sup>1</sup> 2, <sup>10</sup>   9   9   9   9   14   <sup>1</sup> 2 <sup>1</sup> 2 <sup>1</sup> 2   14   <sup>1</sup> 2 <sup>1</sup> 2 <sup>1</sup> 2   16   <sup>1</sup> 2 <sup>1</sup> 2 <sup>1</sup> 2   10   <sup>1</sup> 2		
•	Lusaka City Council		
	Peri-Urban Section		
	Display a plot Add a plot		
	Find an owner Change a plot		
	Delete a plot		
	Print block(s) - in owner name order within block		
	Print block(s) in block, plot order Change info about an owner		
	Print list in name order		
	¶.≁		
	Display statistics		
	Uspay succes		
8 3			
Red	cord: I I I I I I I I I I I I I I I I I I I		
Fo	rm View	NUM	
-	start 🔰 💋 🖨 🕼 🔟 📴 🔛 🌭 🦈 🔯 6 M + 👰 2 A + 🔟 12 + 🚍 3 M + 🛄 L 🏘 Mi 🛃 A 😂 3 I. + 👰 4 M +		
-4	/ start 🔰 🖉 😂 🕼 🗭 🔟 💽 陆 🧮 👩 6 M × 🔍 2 A × 🔟 12 × 🖿 3 M × 🖳 L 🏘 Mi 📴 A 〇 3 I. × 👰 4 M ×	SV 🔇 🖉 🍓 🞯 🛢 🐝 🖏 14:44	
	Benita Nordin - Nairobi 10-12	21	
	November 2004		
	NOVERTIDET 2004		

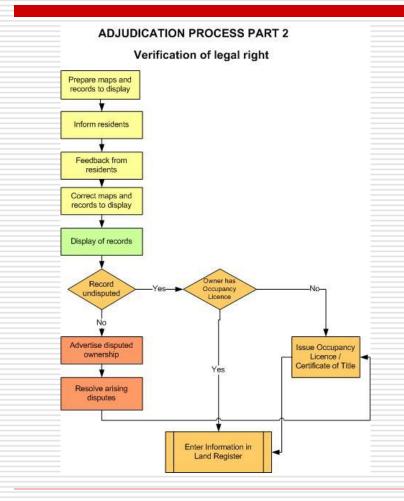
Microsoft Access - [Display a property : Form]		
	n for help 🛛 🗕 🗗 🗙	
ŢTahoma <u>•</u> 8 • <b>B</b> <i>I</i> <u>U</u>   ≡ ≡ ≡   <u>△</u> •   <u>△</u> •   <u>→</u> •   <del>□</del> •   <del>□</del> •   <del>·</del> • <del>,</del> • <u>→</u> • <b>,</b> <del>□</del> • <b>, , , , , , , , , ,</b>		
Display a plot		
Settlement Chaisa Slock 243 Plot/House No 23		
Find      Next plot      Previous plot		
Record: II I III III IIII IIII IIIIIIIIIIIII		
Form View	NUM	
🛃 Start 🔰 🔀 😂 🕼 🚱 🔟 🗟 🖺 🌭 🦈 🔯 6 M + 🔍 2 A + 🔯 12 + 🖿 3 N + 🛄 L 🏘 M 🔁 A 😂 3 L + 👰 5 M + SV 🕏 🗸	and the second states of the s	
	2 2 2 2 2 2 1 1 3 0	
Benita Nordin - Nairobi 10-12	22	
November 2004		

M <mark>icrosoft Access - [Display a property</mark> Eile <u>E</u> dit <u>Vi</u> ew <u>I</u> nsert F <u>o</u> rmat <u>R</u> eco	s Tools Window Heln				Type a question for help
		A -   d -			Type a dacadat for help
-   Tahoma 💽   8					
	Display a plot				
	Black 240 Black	- 41			
Settlement Chaisa	Block 243 Plot	t/House No 23			
Type of tenancy Occupancy license	ccupancy/Title No. 10269	Date of registration	1988-04-28		
Joint ownership (Y/N)					
Owner(s)					
lame	Sex Marita	al status National Registration Ca	rd No.		
			100 C		
'ulu Edward	M	223055/11/1			
Find Next plot Previou	plot D*				
Find Next plot Previou	plot 1				
Find Next plot Previou	plot				
Find Next plot Previou	plot				
Find Next plot Previou	plot 💽				
Find Next plot Previou	plot 💽				
Find Next plot Previou	plot				
Find Next plot Previou	<u>plot</u>				
Find Next plot Previou	plot				
Find Next plot Previou	plot				
Find Next plot Previou	plot.				
Find Next plot Previou					
ord: 【◀ ◀   1 ▶ ▶1 ▶* of	plot				
ord: III >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>					NUM
ord: 【◀ ◀   1 ▶ ▶1 ▶* of		12 - 📬 3 V - 🔛 L	Mi	⊖3L - 25M -	NUM
ord: III >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>		12 • 🖿 3 V • 🔡 L	M	⊖3L • Ø5M •	and the second s
ord: II I I I I I I I I I I I I I I I I I		12 - 📬 3 V - 🔣 L	Mi 🔀 A	<mark>3L y 25M y</mark>	and the second s
ord: II I I I I I I I I I I I I I I I I I	 Б. — — — — — — — — — — — — — — — — — — —	a Nordin - Nairobi -		⊖3L - 25M -	and the second s

Microsoft Access - [Statistics : Form]			
Elle Edit View Insert Format Records Tools Window Help		Type a question for help	
		The advector to the	
Tahoma 8 B I U	≣ ≡   ⊉ +   ▲ +   ⊿ +   🔚 +   □ +		
🖌 •   🔒 🔃 🧐 🖉   🎖 🖻 🛍   🍽   🧶   💱 🏹 🏹 🆄	Y   #     =   X   🚰   🛅 🖬 +   @ 💂		
Statistics			
Specify Improvement Area Chaisa			
Display statistics			
Display statistics			
cord: 🚺 🕘 👔 🕨 🕨 🕨 🕨 of 1			
orm View		NU	M
y start 🔰 💋 😂 🖆 🞯 🖾 🧕 🖉 🖬 🛌 👋 🚺 б м 🕞	@ 24 - 100 12 - 100 3M - 100 1 APM	🔁 A 😂 B.L 🔹 🖉 5 M 🔹 SV 🔇 🗾 🍓 🔘 🛢	<b>3 3</b> 14·57
			10 00 1 1.32
	Benita Nordin - Nairobi 10-12		24
	November 2004		

Microsoft Access - [Statistics : Formattics]	n]	
: 🔄 File Edit View Insert Format	Records Tools Window Help Type a question for help	• - 8 ×
Tahoma	•   8 •   <b>B</b> <i>I</i> <b>U</b>   <b>E E E</b>   () •   <b>A</b> •   <b>U</b> •   <b>D</b> • <b>E</b>	
	ਤੂ¦≋ਾ। <mark>B</mark> ℤ╙╎═══╡⊘┽∖ <mark>Δ</mark> ┽╵╝┽╵╸╸ <mark>,</mark> S\୭╎%, St\℁⅋⅋ℤѨ┝⋗⋉∖╩╎╔┺╷ᅇ,	
Statistic		
Specify Improvement Area	Chaisa	
No. of plots/Houses	1634 No. of blocks 70	
No of Occupancy Licenses	682 No. of Joint O-ship 5	
No. of plots with one	1631 Two 3 Three owners	
No. of male owners	1384 No. of female owners 253	
No. of plots with only male owners	1381	
No. or plots with only male owners		
No. of plots with only female owners	250	
Married owners -male	1034 Female 96	
Divorced owners - male	0 Female 4	
Single owners - male	18 Female 33	
Widowed owners - male	6 Female 16	
-		
Display statistics		
Record:	of 1	
Form View		UM
	(2) AICVIEW GIS 3.2 TOF WINDOWS	
🦺 start 📄 🖪 😂 🖴 🕼 😨	3] 🔟 🖕 🤌 👩 6 M 🔹 👰 2 A 🗧 💯 1 2 🔹 3 M 👻 🗓 L 🖓 Mi 🔯 A 🔅 3 L 👻 🦻 S M 👻 S V 🔇 🗩 🌺 🕥 🌒	<b>14:53</b>
	Benita Nordin - Nairobi 10-12	25
	November 2004	

### **Adjudication part 2**



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

### Adjudication part 2

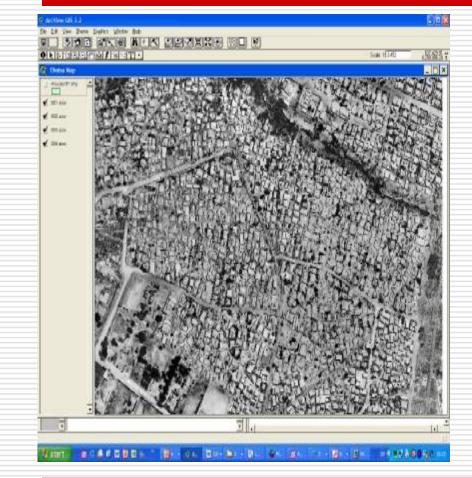
#### o Display of Records

- 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



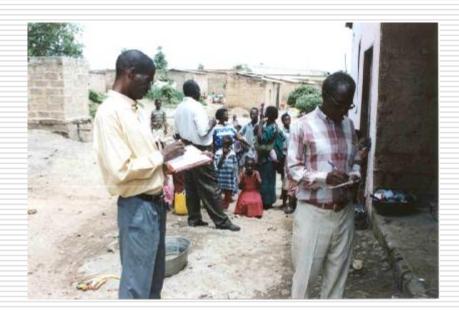
- Orthophotos or satellite images basic source
- Fairly new images
- Verification on the ground

### 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	М		

Benita	Nordin	- Nairobi	10-12
	Novemb	oer 2004	

### Quality of the data

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

Dis	stance 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
    - o 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.