

# Version 1 of the FIG Core Cadastral Domain Model

XXIII International FIG Congress

Munich, Germany, October 9<sup>th</sup> 2006

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Peter van Oosterom, TU Delft, The Netherlands



# Standards

- There are supposed to be huge differences between cadastral and land registry systems
- Look to the common area's:
  - Standardised Model (adaptable, extensible)
  - Avoid re-inventing the wheel
  - Enable involved parties to communicate

# Standards

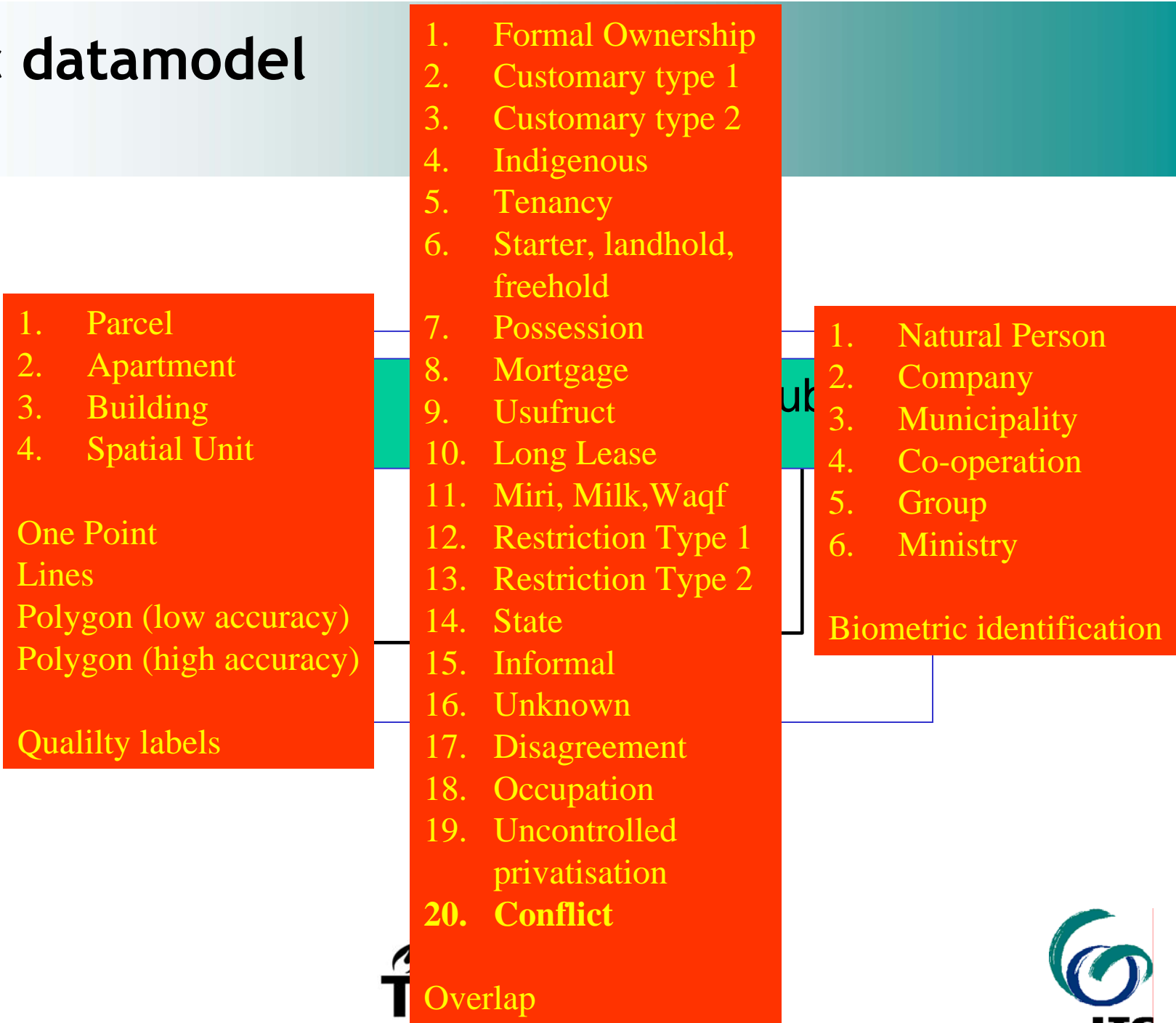
- Many countries want to computerize their land administration
- Land administration *modeling* is complex. Especially in a distributed environment
- Lack of a shared set of concepts and terminology in the Cadastral Domain

# Proposal (FIG Washington 2002)

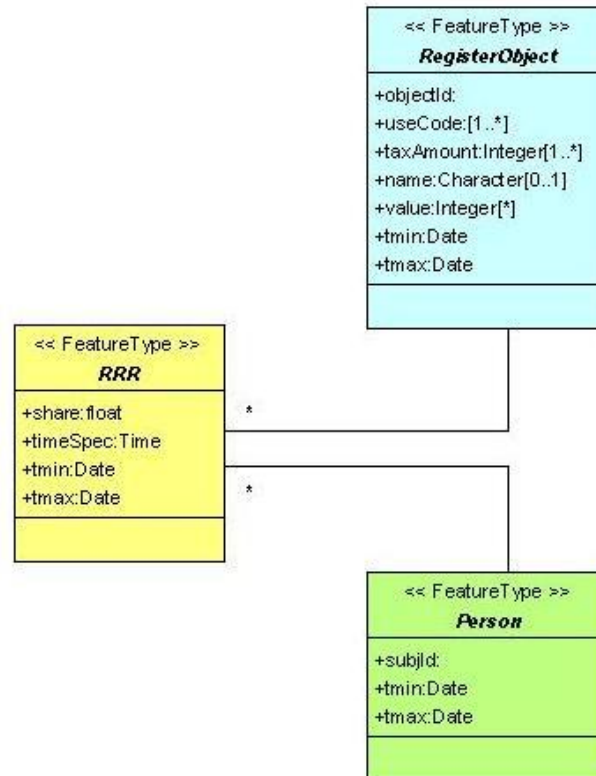
- Develop standard Core Cadastral Domain Model, including:
  - Spatial part (geometry, topology)
  - Extensible frame for legal/admin part
  - Based on core **object-right-subject** model
- Object-orientation → express in UML
- Accepted by large community: FIG, OGC, ISO, user support, this means it can be **adapted by the industry**
- Maximize co-operation, minimize double effort



# Basic datamodel



# Model basis: Object-Right-Subject



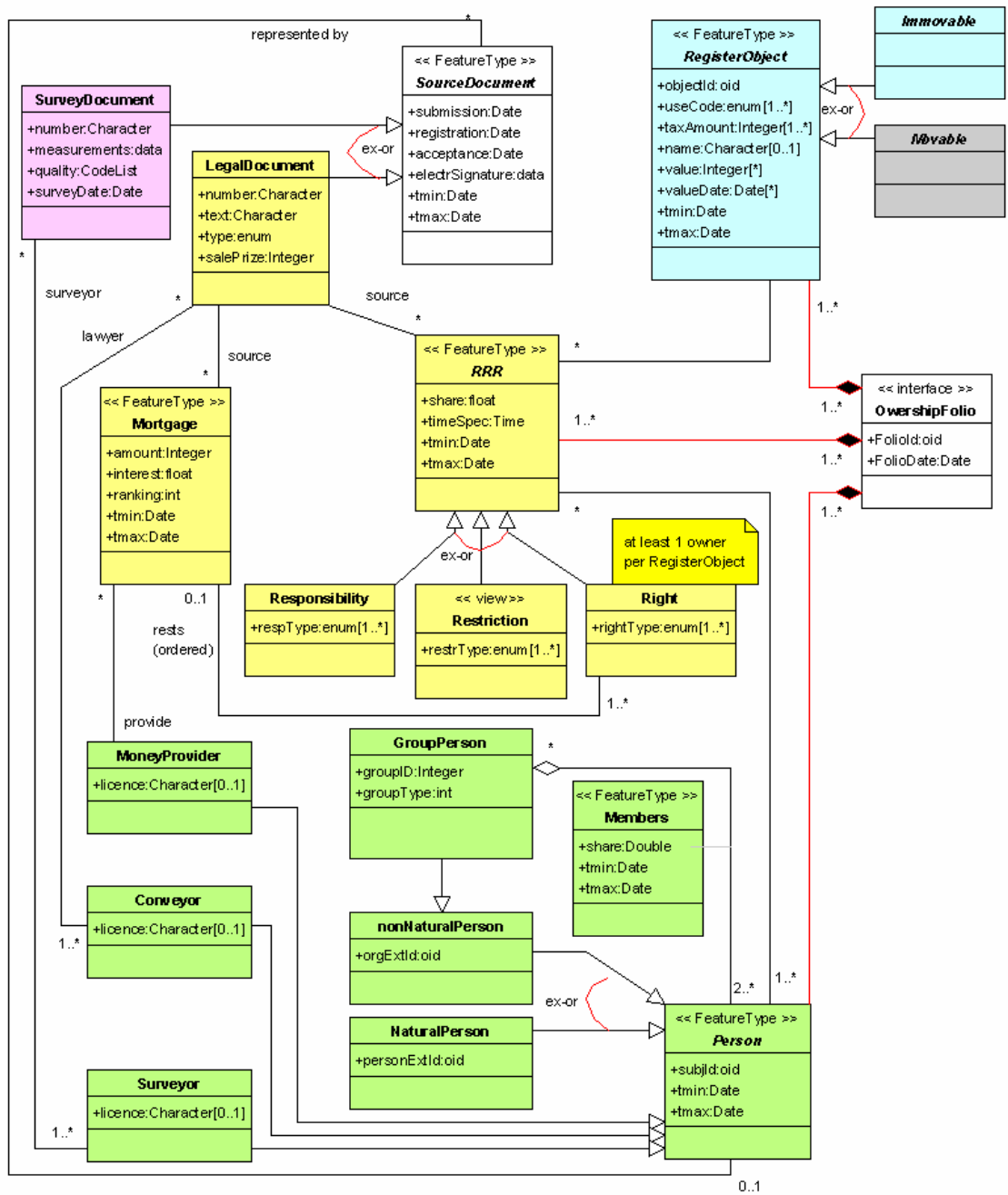
# Core Cadastral Domain Model: Legal-administrative

- Right Restriction Responsibility
- Mortgage, RRR are based on legal documents or decisions
- Person are specialised as natural or non natural
- Group of Groups of persons
- Surveyor, conveyor and money provider are included, specialisations of the Persons class
- A RRR can be temporal
- Urban/rural, land valuation, land use

# Spatiotemporal objects

- Temporal/dynamic aspect relevant:
  - Long lease (or ownership for limited time)
  - Nomadic behaviour
  - Time-sharing (mon-fri:X, sat-sun:Y)
  - Fishing/hunting rights during certain season





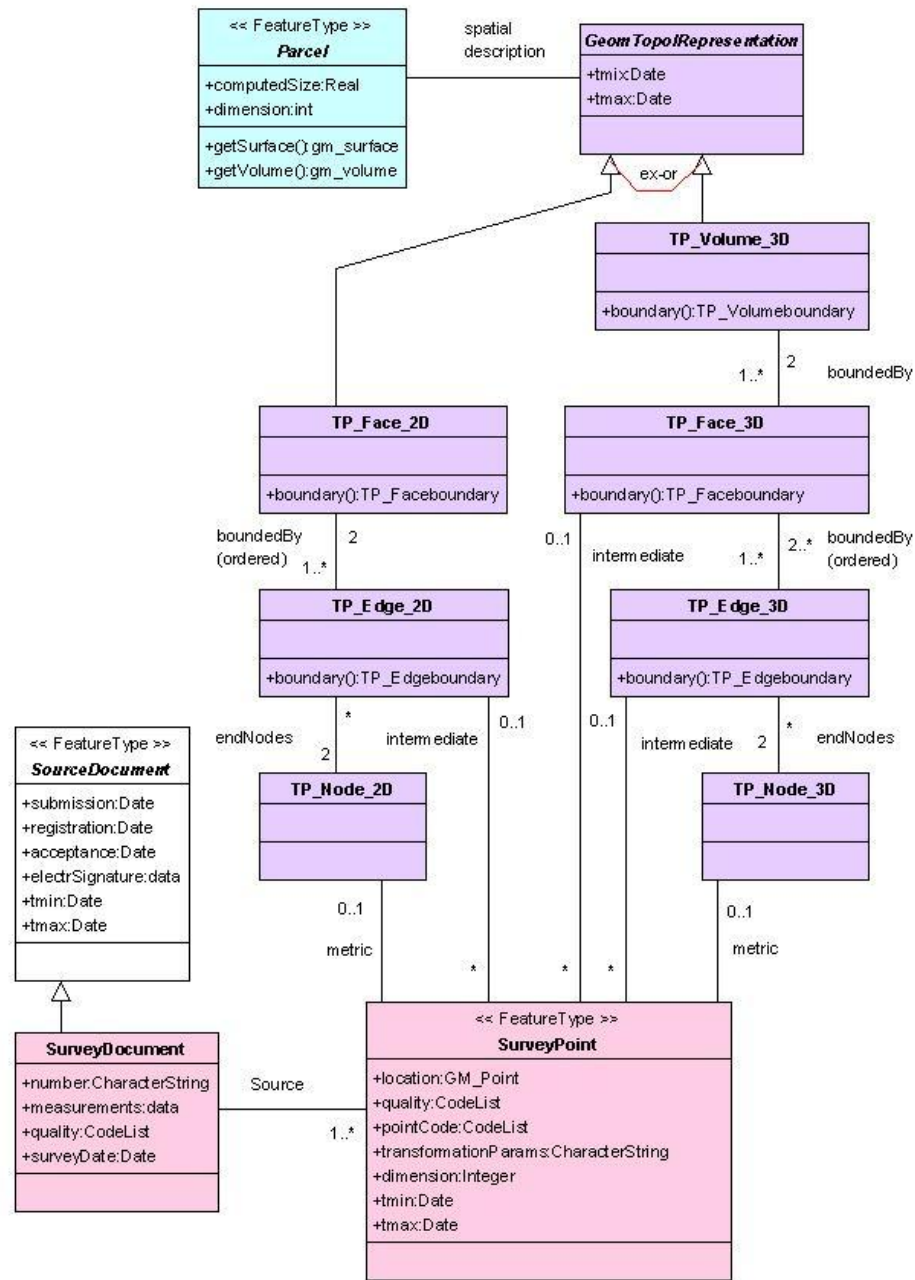
# Core Cadastral Domain Model: Geometry

- Real estate object with specialisations, e.g. parcel, parcel-complex, volume property, restriction area, point parcel, apartment unit, based on topological structure or not
- Agregations like parcels set, parcel complex, apartment complex
- Link to surveying and survey documentation
- Link to OGC standards (Nodes, Edges and Faces)
- Interface classes (to visualise, organise)

# ‘Spatial Objects’, ‘Spatial Units’, ‘Parcels’...

- Not always available in the format of a planar partition
- Sometimes just one reference point available or ‘unconnected’ polygon (or spaghetti) → these solutions may be sufficient (and cost effective)





# Social Tenure Domain Model

- Re-usability of the functionality of the Core Cadastral Domain Model





كفوض كبر خالي الشرقى ٢٥

كفوض خارج الزمام البحري ٥٢

در مسقط رأسه للزمام

منطقة تاروقس ١٠٨٥

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مساحة









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Cambio de trazo  
Aprobado por la CMD.  
Fecha: Julio 91

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LRA (RED L)

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| 02 | A597491 | ODSG | B. Akintayo                  | 8/12/88  | 1  | 1  | 450 |
|----|---------|------|------------------------------|----------|----|----|-----|
|    | A590409 | ✓    | A. Adegbamigbe & Soolid      | ✓        | 2  | 2  | ✓   |
|    | A590293 | ✓    | D. M. Obarinji               | ✓        | 3  | 3  | ✓   |
|    | A260719 | ✓    | E. O. Soremi                 | 12/12/88 | 4  | 4  | ✓   |
|    | A590437 | ✓    | A. O. Akunrogunde            | ✓        | 5  | 5  | ✓   |
|    | A5098   | ✓    | V. A. Awegbusi (nee Funlode) | 14/2     | 6  | 6  | ✓   |
|    | A3804   | ✓    | S. Olaboyade                 | ✓        | 7  | 7  | ✓   |
|    | A5477   | ✓    | E. O. Adegboye               | ✓        | 8  | 8  | ✓   |
|    | A2604   | ✓    | K. Adejumo                   | 15/12    | 9  | 9  | ✓   |
|    | A5540   | ✓    | H. B. Olatun                 | 15/12    | 9  | 9  | ✓   |
|    | A5588   | -    | M. O. Ajaja                  | 16-12-88 | 10 | 10 | ✓   |
|    | A/5415  | -    | L. O. Olorunfemi             | 19/12/88 | 11 | 11 | ✓   |
|    | A/5660  | ✓    | B. & F. Isiyola              | 21/12/88 | 12 | 12 | ✓   |
|    | A5600   | ✓    | E. A. Abimbola               | ✓        | 13 | 13 | ✓   |
|    | A5578   | ✓    | O. Okankiri                  | 23/12/88 | 14 | 14 | ✓   |
|    | A5608   | ✓    | J. A. Alade                  | ✓        | 15 | 15 | ✓   |
|    | A5547   | ✓    | I. O. Adalumo                | 28/12/88 | 16 | 16 | ✓   |
|    | A5530   | ✓    | G. O. Oyo                    | 29/12/88 | 17 | 17 | ✓   |
|    | A5521   | ✓    |                              |          |    |    |     |









27.10.2004



# Benny, Indonesia











**B. ផ្តល់ព័ត៌មានអ្នកកាន់សម្បទាន**  
**IDENTIFICATION OF THE OWNER**

1-លេខកាត់សម្បទាន (UPFN) ខេត្ត ក្រុង ឃុំ ភូមិ លេខក្រុមផ្ទះ  
 2-អង្គការកាន់សម្បទាន (Identification of owner: 21107040146113171)

|  | ប្រុស / Man      | ស្រី / Woman     |
|--|------------------|------------------|
| លេខកាត់សម្បទាន / ID Card                       | 142992 គ.ក       | 142943 គ.ក       |
| ឈ្មោះ / Name                                   | ឃុន ឆែ           | ឃុន ឆែ ឃុន ឆែ    |
| ថ្ងៃ ខែ ឆ្នាំ កំណើត / Date of birth            | 1947             | 1957             |
| ស្ថានភាពកាន់សម្បទាន / Owner status             | កាន់សម្បទាន ឯកជន | កាន់សម្បទាន ឯកជន |
| ទីកន្លែងកំណើត / Place of birth                 | ស្រុក ឃុន ឆែ     | ស្រុក ឃុន ឆែ     |
| ជាតិជាតិ / Nationality                         | ខ្មែរ            | ខ្មែរ            |
| ឈ្មោះបិតា / Father's name                      | ឃុន ឆែ           | ឃុន ឆែ           |
| ឈ្មោះម្តាយ / Mother's name                     | ឃុន ឆែ           | ឃុន ឆែ           |
| អាសយដ្ឋាន (បើខុសពីអាសយដ្ឋានក្នុងប្រតិបត្តិការ) | ស្រុក ឃុន ឆែ     | ស្រុក ឃុន ឆែ     |

- 3-ប្រភេទសម្បទាន / Kind of property:
- 3.1- ម្ចាស់ស្រែ / Property of Husband  PM
  - 3.2- ម្ចាស់ស្រែស្រី / Property of Wife  PF
  - 3.3- ម្ចាស់ស្រែរួមគ្នា / Common Property  BC
  - 3.4- ម្ចាស់ស្រែឯក / Single Property
  - 3.5- ម្ចាស់ស្រែរួមគ្នា / Co-ownership
  - 3.6- ម្ចាស់ស្រែក្រុមហ៊ុន / Company Property
  - 3.7- ម្ចាស់ស្រែសាធារណៈ / Public Domain
  - 3.8- ម្ចាស់ស្រែឯកជន / Private Domain
  - 3.9- ម្ចាស់ស្រែសមាគម / Property of Association
  - 3.10- ម្ចាស់ស្រែសាសនា / Religious Property
  - 3.11- ម្ចាស់ស្រែព្រះមហាក្សត្រ / Property of Crown
  - 3.12- ផ្សេងៗ / Other.....

4-ស្ថានភាពសម្បទាន / Legal status: មិនមានបញ្ហាអ្វីឡើយ  មិនមានបញ្ហាសម្រាប់បញ្ជាក់សម្បទាន / POT  មិនមានបញ្ហាសម្រាប់សម្រេច / Possession   
 មិនមានបញ្ហា / No site  ត្រូវបញ្ជាក់បញ្ជីសម្បទាន / Title requested  មិនមាន / Dispute

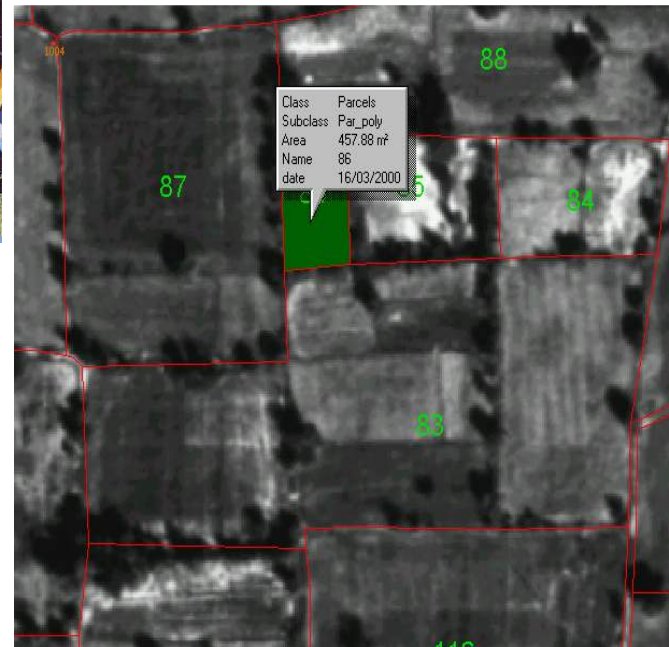
5-ប្រភេទសម្បទាន / Source of land tenure: ដីស្រែសម្បទាន រដ្ឋបាល / កាលបរិច្ឆេទ / Date: 1984

6-ប្រភេទសម្បទាន: ប្រតិបត្តិការ / បញ្ជាក់សម្បទាន / ឃុន ឆែ

7-អង្គការកាន់សម្បទាន / Identification of the legal person:  
 លេខកាត់សម្បទាន / Statute:  ឈ្មោះ / Name: .....  
 កាលបរិច្ឆេទសម្បទាន / Registration date: ..... លេខសម្បទាន / Registration number: .....  
 ឯកសារសម្រាប់សម្រេច / Reference document: .....  
 អាសយដ្ឋាន (ទីស្នាក់ការ) / Address (headquarters): .....  
 អង្គការកាន់សម្បទាន (ឬ អ្នកកាន់សម្បទាន) / Identification of representative (or trustee):  
 ឈ្មោះ / Name: ..... លេខកាត់សម្បទាន / ID Card number: .....  
 តំណែង / Function: .....

8-ចម្រើនសម្បទាន / Thumb print: ឃុន ឆែ ឃុន ឆែ ឃុន ឆែ  


9-នាមអ្នកនាំមុខប្រកបដោយសមត្ថកិច្ច / Team leader name: ឃុន ឆែ  
 កាលបរិច្ឆេទ / Date: 13.12.1998  
 ហត្ថលេខា / Signature: ឃុន ឆែ



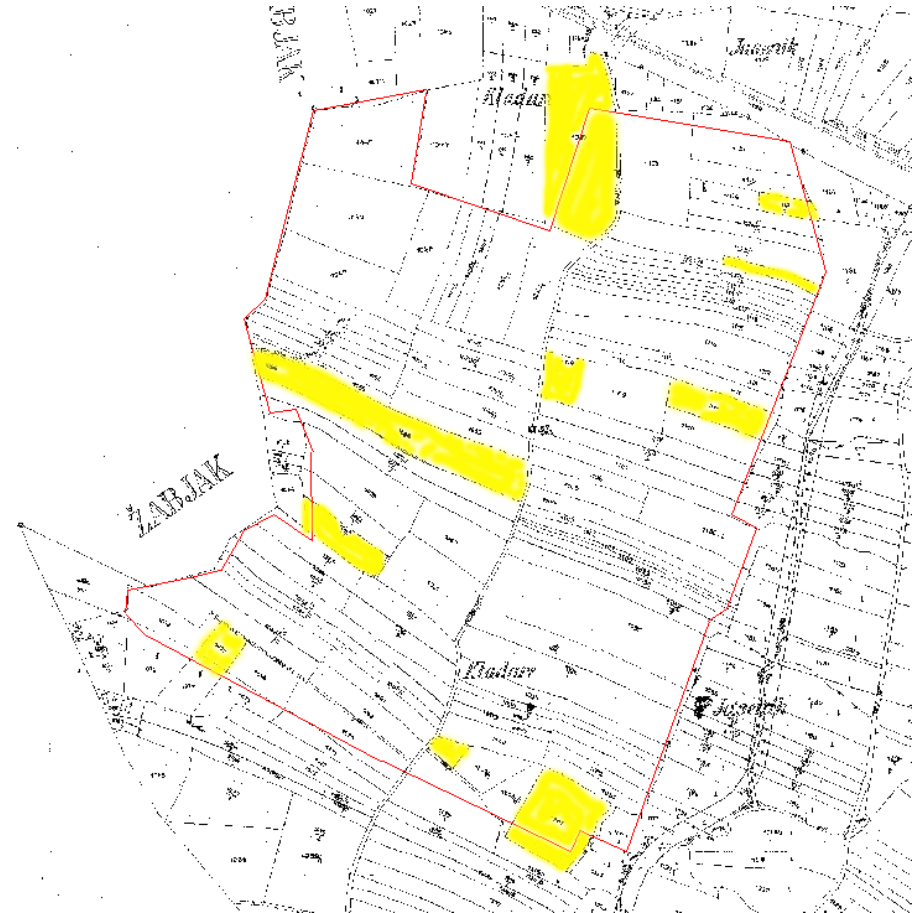


# Example: K.o. Klokočevac, Croatia

Situation in the field



Situation on Cadastral map



■ Parcels with unsolved ownership













# Density of an informal settlement





# Customary, informal and post conflict tenure

- Overlapping rights and claims
- Family and group rights
- Social land tenures/livelihoods

# Global Land Tool Network (GLTN)

## GLTN key priorities:

- Develop innovative, pro poor and gendered land tools
- Unblock and upscale existing initiatives
- Strengthening existing networks
- Global coordination and integration
- Dissemination of knowledge

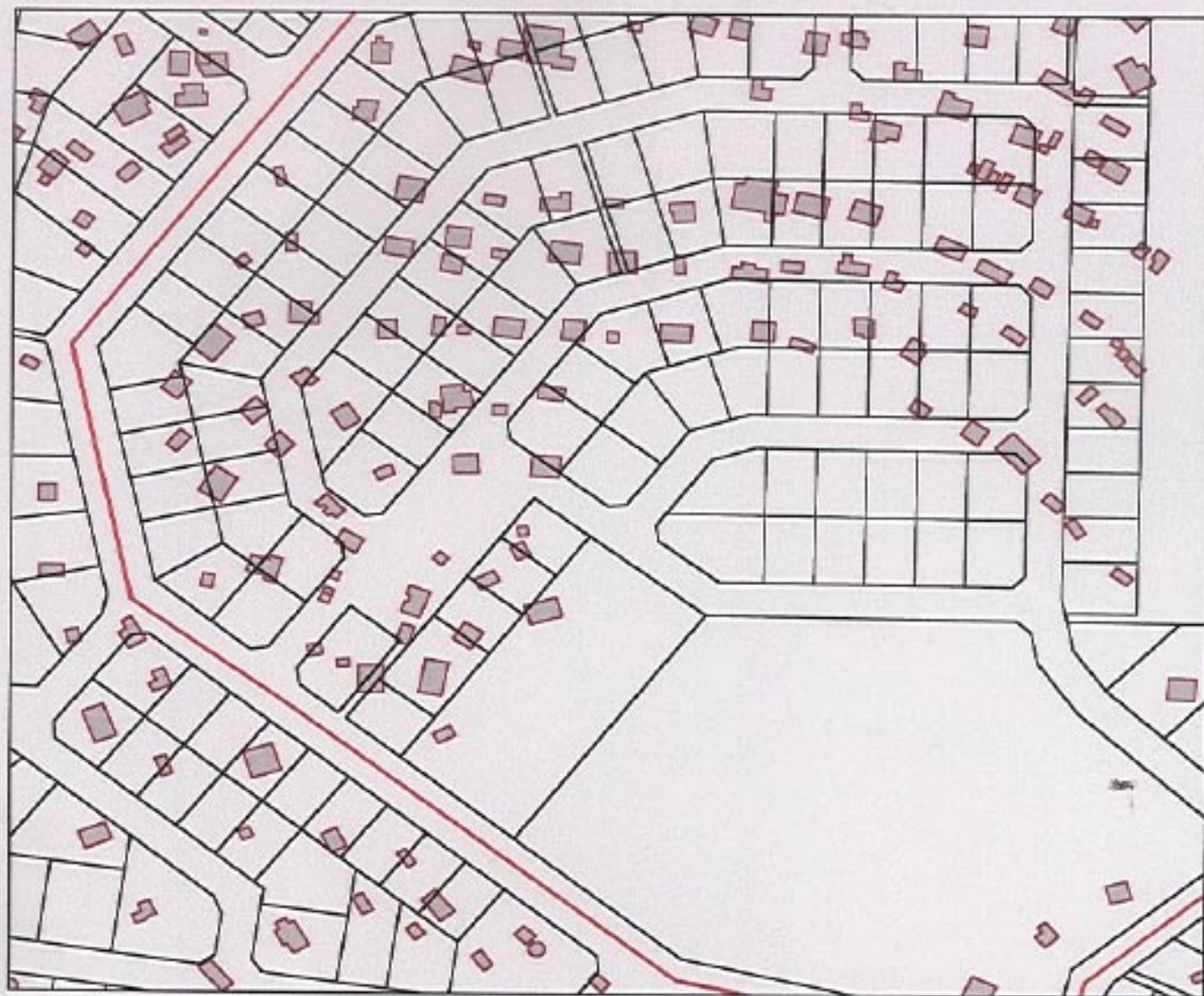






UN-HABITAT

www.GLTN.net



G L O B A L L A N D T O O L N E T W O R K



-  MainRoads
-  SECONDARYROADS
-  Cadastral
-  EDEN\_BLD





# Social Tenure Domain Model

- Merge informal/formal tenure systems?
- Reversibility from database to a paper based
- Different spatial reference systems
- Documents without spatial reference
- Linking mechanisms between systems (spatial or by identifiers)
- Source data without spatial reference
- Different source data with different (spatial) accuracies
- User interface
- Processes, e.g. participatory approach
- Equal access to land
- Range of spatial units, unit identifiers
- Overlap of tenures on one spatial unit, parcel or object
- UN-HABTAT's 'Continuum of rights'
- Land Tax and Land Use

# Way forward

- ISO
- INSPIRE
- EULIS
- FIG partner of GLTN (UN Habitat): STDM



# Conclusion

- CCDM is available
- CCDM functionality is re-usable but has to be further reviewed and assessed by experts in Social Tenure

# Thank you!

- [www.fig.net](http://www.fig.net)
- [www.oicrf.org](http://www.oicrf.org)
- [www.gdmc.nl](http://www.gdmc.nl)
- [www.unhabitat.org](http://www.unhabitat.org)
- [www.gltm.net](http://www.gltm.net)

