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# **Innovative directions in land registration practice in the 21<sup>st</sup> Century:**

## **From first registration to interoperability of systems, with case studies of Turkey and Colombia**

**Malcolm Childress**



# Introduction

Middle income countries across the globe are seeking to modernize governance via e-government, including in Land Registration and Cadastre.

Property rights for economic growth, public goods like infrastructure and environmental management, and local finance are critical areas of government services, and also key elements of social stability.

Massive advances in technology create new options for data capture and management, multi-functionality and interoperability.

Digital mapping and GIS creates the basis for integrating data on ownership rights with spatial information on locations and boundaries.

Integrated digital systems permit additional layers to be overlaid, including valuation, with interoperability with other systems such as property tax.

But the transitional pathway to acquiring data on the ground, or through digitization of records, putting it into a structure for permanent use and updating, and managing the system is a complex undertaking, a large investment, involves multiple institutions and requires multiple years of implementation, and has social, environmental and political implications.

GLA studies these transitional pathways with a focus on functionality and equity for local communities.

# Turkey:

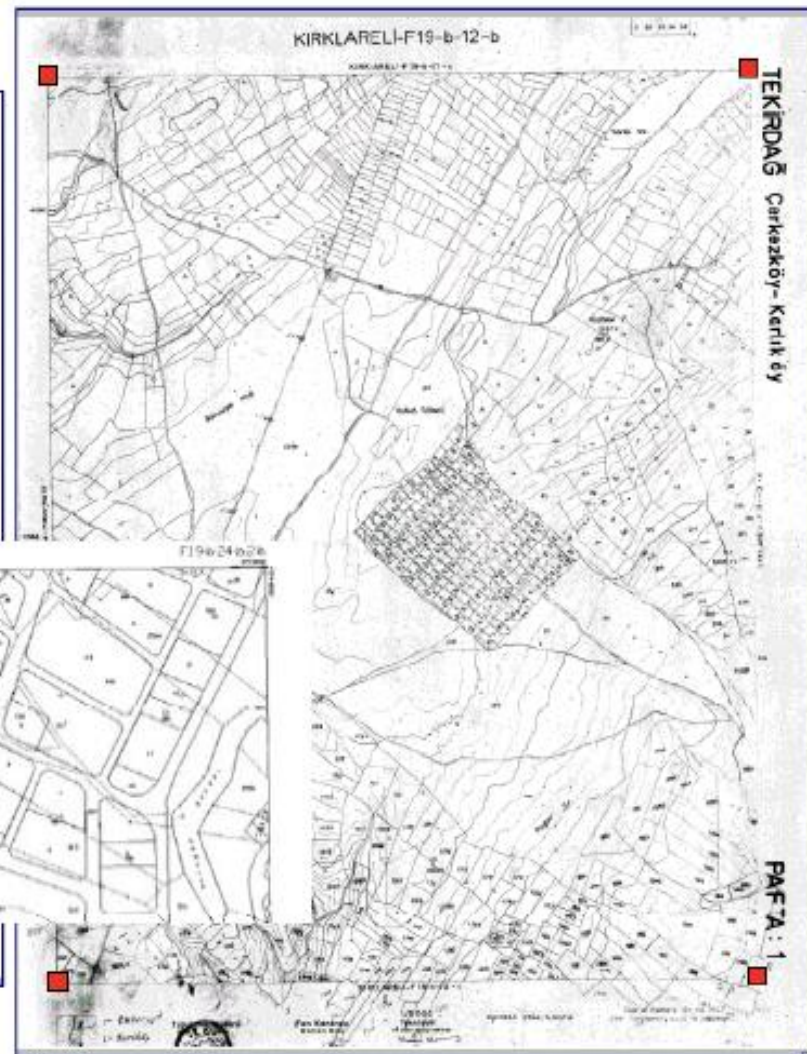
- 784,000 km<sup>2</sup>;
- Population: 85 million, 76 percent urban;
- GDP/capita: \$12,600 (2022);
- General Directorate of Land Registry and Cadastre under the Ministry of Environment, Urbanization and Climate Change (TKGM);
- 22-year effort to create the Land Registry and Cadastre Information System (TAKBIS);
- Rationale based on construction sector boom, need for improved property taxation and shift to E-government services;
- 2000-2005 Pilot Phase; 2005-2022 Implementation;
- 55 million parcels, 1000 local offices;
- \$200 million with national budget and World Bank financing.

## Colombia:

- 1,140,000 km<sup>2</sup>;
- Population: 51 million, 81.7 percent urban;
- GDP/capita: \$6,817 (2022);
- National Land Administration System—under the National Land Agency (ANT) with multiple implementing agencies;
- Rationale based on Peace Accords, rural poverty, need for local finance through property tax;
- 2016-2021 Pilot Phase; 2022- expansion;
- 12-20 million parcels estimated;
- \$200 million estimated cost with national budget and World Bank financing,

# Turkey Case Study

## Sample Cadastral maps

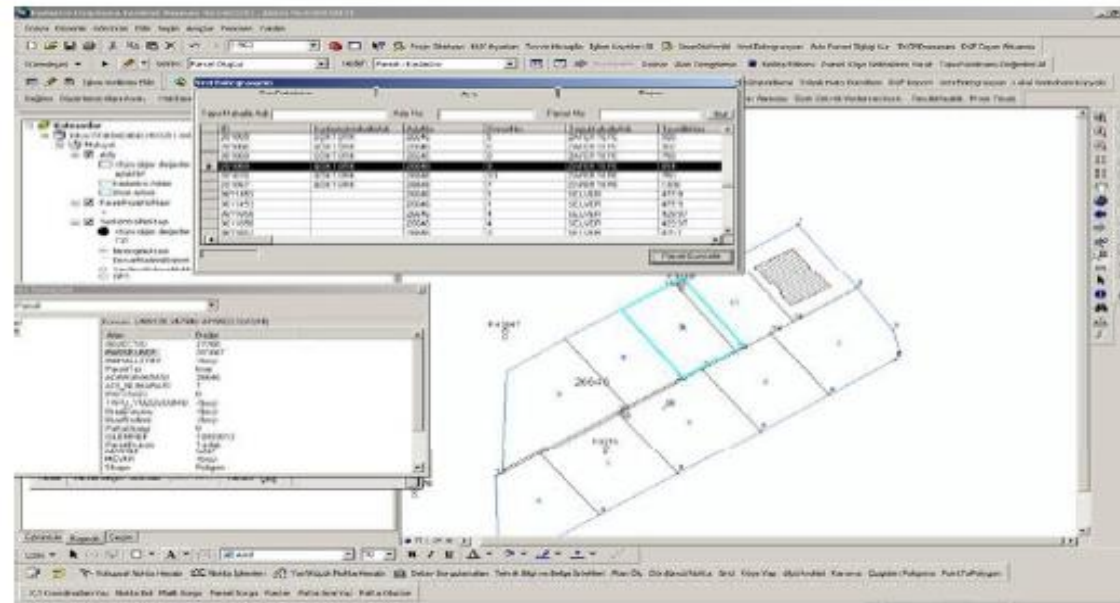


Source: Sedat Bakici, TKGM

# Turkey Case Study

## CADASTRAL LAYERS (feature classes in Ownership Dataset)

1. District Boundry (Köy-Mahalle)
2. Lot (Ada)
3. Parcel (Parsel)
4. Legalized Building (Yasal Bina)
5. Parcel Vertex Point (Parsel Köşe Noktası)
6. Control point (Kontrol Noktaları)
7. Geometry of Rights (İrtifak, Geçit Hakları vb.)



Source: Sedat Bakici, TKGM



## Turkey Case Study

### Sample register page (title deed)

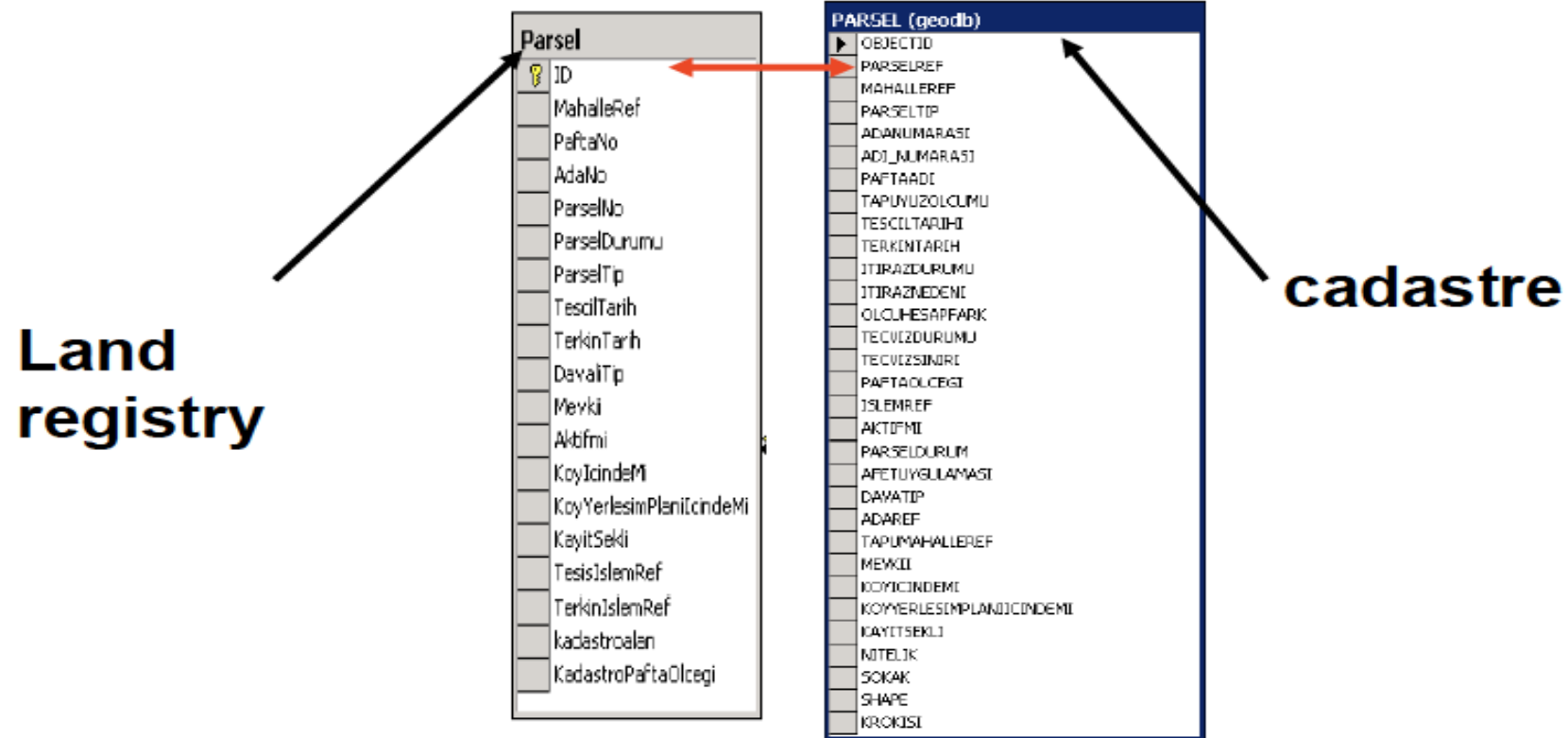
[illegible]

MÜLKİYET			
Mallikın Adı, Soyadı ve Baba adı	Adet Sahipliği Bölün. Pns.	Yüzölçü Sahibi Sahip Beledi	Kayn Tarih
Kadir TURAN, Yakup oğlu	1/1	Kadastro	12.11.2004
Emirhan TURAN, Yakup oğlu	1/1	Kadastro	12.11.2004
İhsan TURAN, Yakup oğlu	1/1	Kadastro	12.11.2004
Halil TURAN, Yakup oğlu	1/1	Kadastro	12.11.2004
Hüseyin TURAN, Yakup oğlu	1/1	Kadastro	12.11.2004

Source: Sedat Bakici, TKGM

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# Turkey Case Study

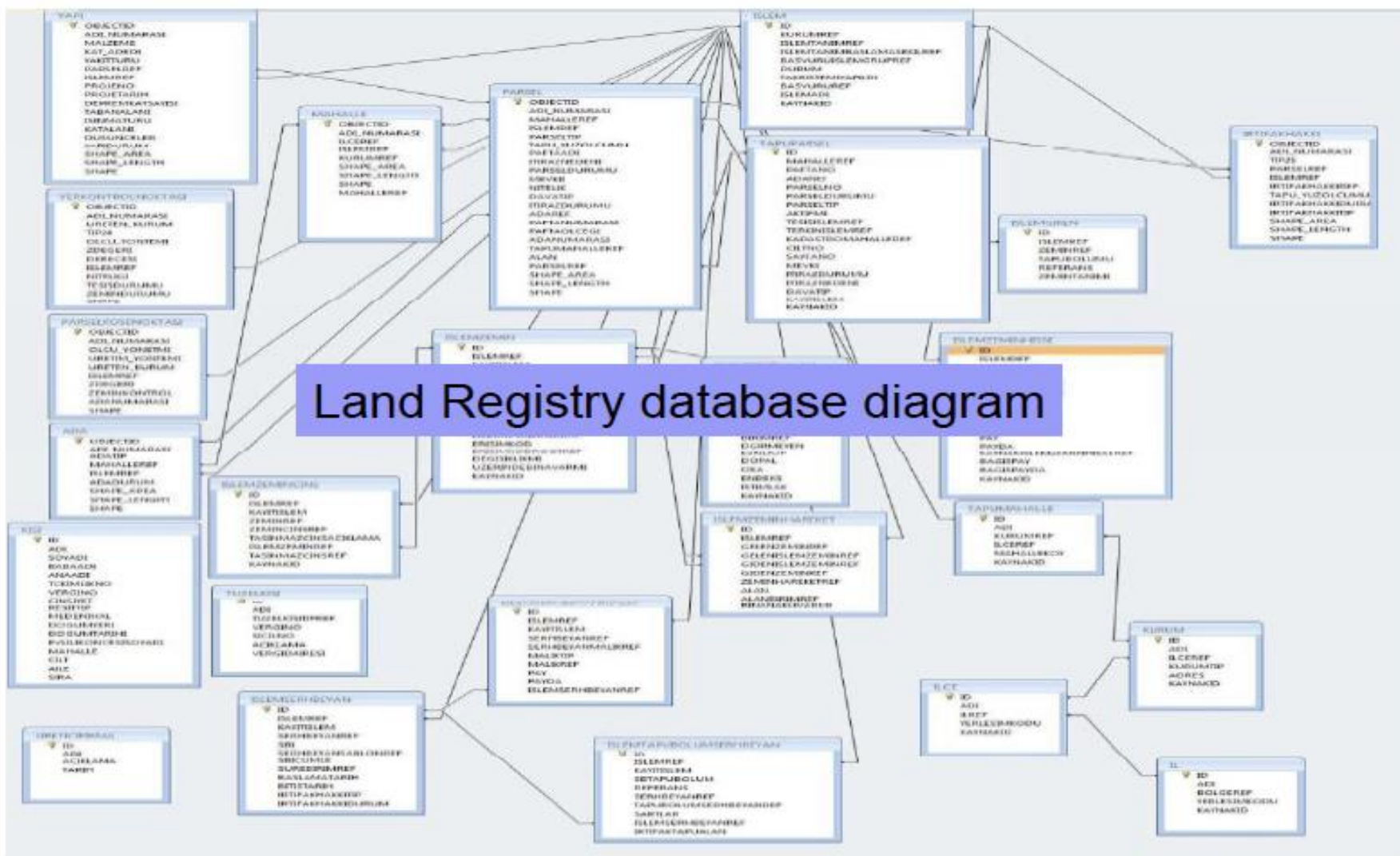


INTEGRATION PROCESS

Source: Sedat Bakici, TKGM



# Turkey Case Study



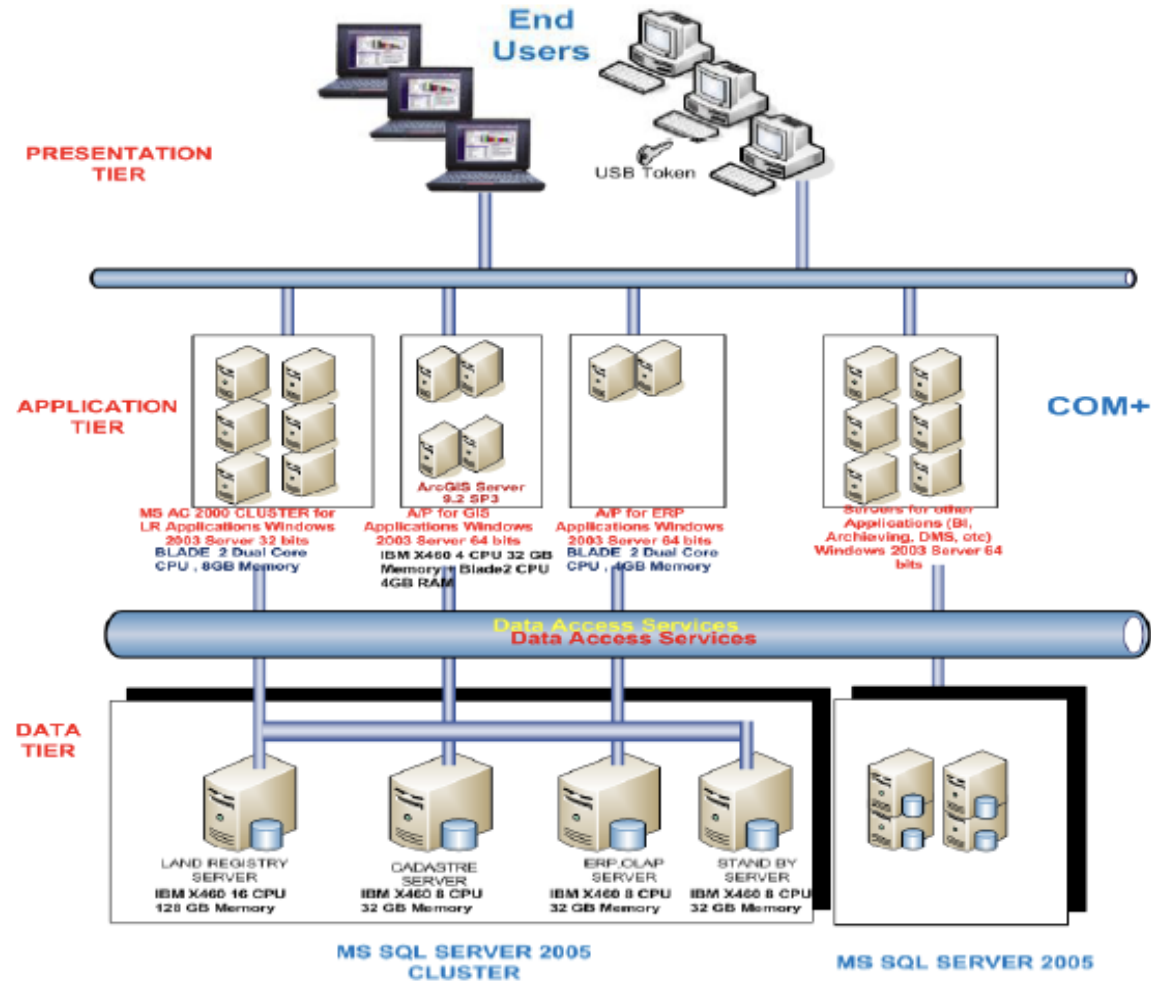
Source: Sedat Bakici, TKGM

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# Turkey Case Study

## ARCHITECTURE AND DATA MODELS

### TAKBIS-SYSTEM GENERAL OVERVIEW



Source: Sedat Bakici, TKGM

# Turkey Case Study

## ARCHITECTURE AND DATA MODELS

TSUY end user interface (Land Registry Application Software)

The screenshot displays the 'Form Arama Kriterleri' (Form Search Criteria) window in the TSUY application. The window title is 'TF0633 - Malik Taşınmaz Sorgulama'. The interface is divided into two main sections: 'Form Arama Kriterleri' on the left and 'Form Arama Sonuçları Listesi' on the right.

**Form Arama Kriterleri (Left Panel):**

- Arama Kriterleri:** A list of search criteria with checkboxes: ☒ Ad/Soyad, ☒ Mahalle, ☒ Ada/Parsel, ☒ Cins, ☒ Yüzölçüm, and a checkbox for 'Üzerine KM/Ki kurulan Ana Taşınmaz hisselerini de getir'.

**Form Arama Sonuçları Listesi (Right Panel):**

- Tüzel Kişi:** A text field containing 'MALİYE HAZİNESİ'.
- Mahalle:** A text field.
- Pafta, Ada, Parsel:** Three text fields for land identification.
- Taşınmaz Cinsi:** A text field.
- Taşınmaz Cins Açıklama:** A text field.
- Yüzölçüm Alt Sınır (m2):** A text field.
- Yüzölçüm Üst Sınır (m2):** A text field.
- Yüzölçüm (m2):** A central text field flanked by '<=' and '>=' symbols.

**Malik Tipi (Top Right):** A group box containing radio buttons for 'Gerçek Kişi', 'Zemin', 'Köy', 'Tüzel Kişi', 'Ülke', and 'Organizasyon'. 'Tüzel Kişi' is selected.

**Footer:** The bottom status bar shows the date '29/01/2009' and the text 'Taşınmaz Cinsi Seçiniz'.

Source: Sedat Bakıcı, TKGM

## Turkey Case Study

On-line data sharing from TAKBIS:

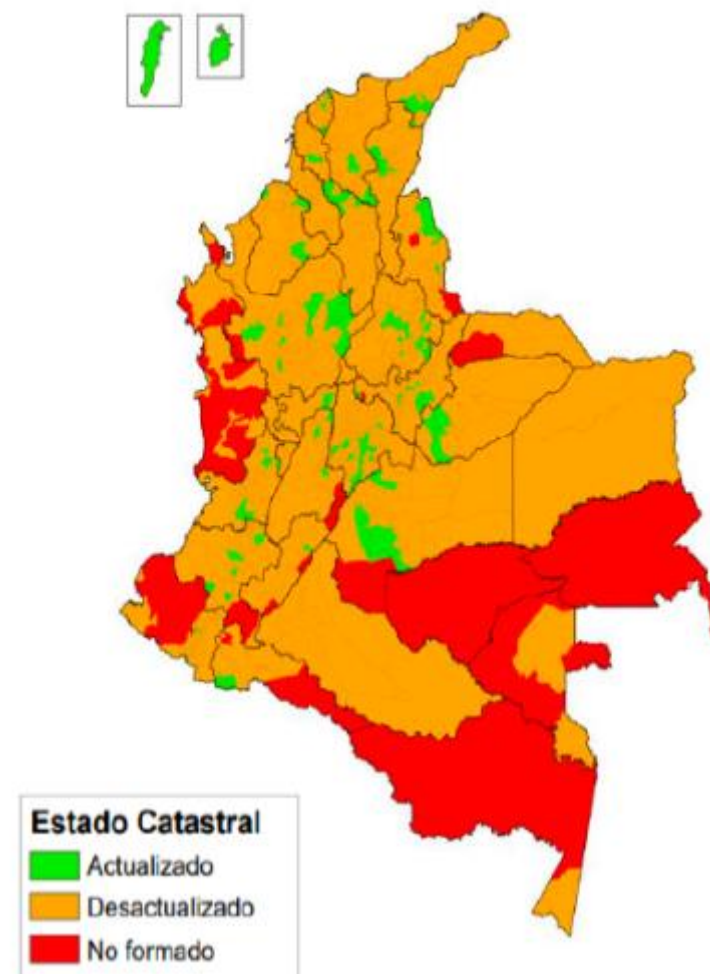
- Prime Ministry General Directorate of Social Assistance and Solidarity (SOYBIS)
- Ministry of Justice (UYAP)
- Ministry of Finance;
- Financial Crimes Investigation Board
- Revenue Administration (VEDOP)
- General Directorate of National Property.

Source: TKGM

# Colombia Case Study

## Status of Cadaster in 2019

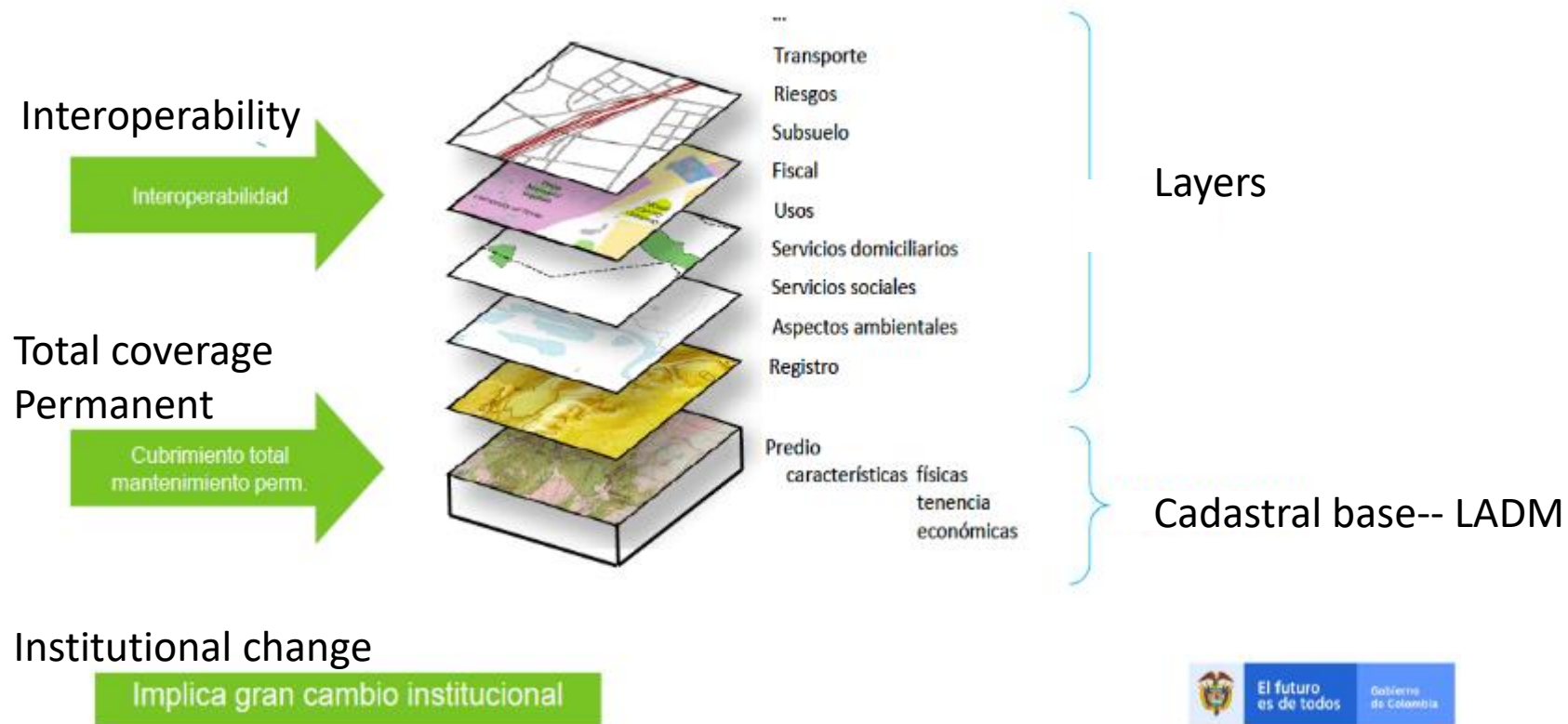
- **5,68%** Up to date
- **28,32%** Not established
- **66,01%** Out of date



Source: Government of Colombia

# Colombia Case Study

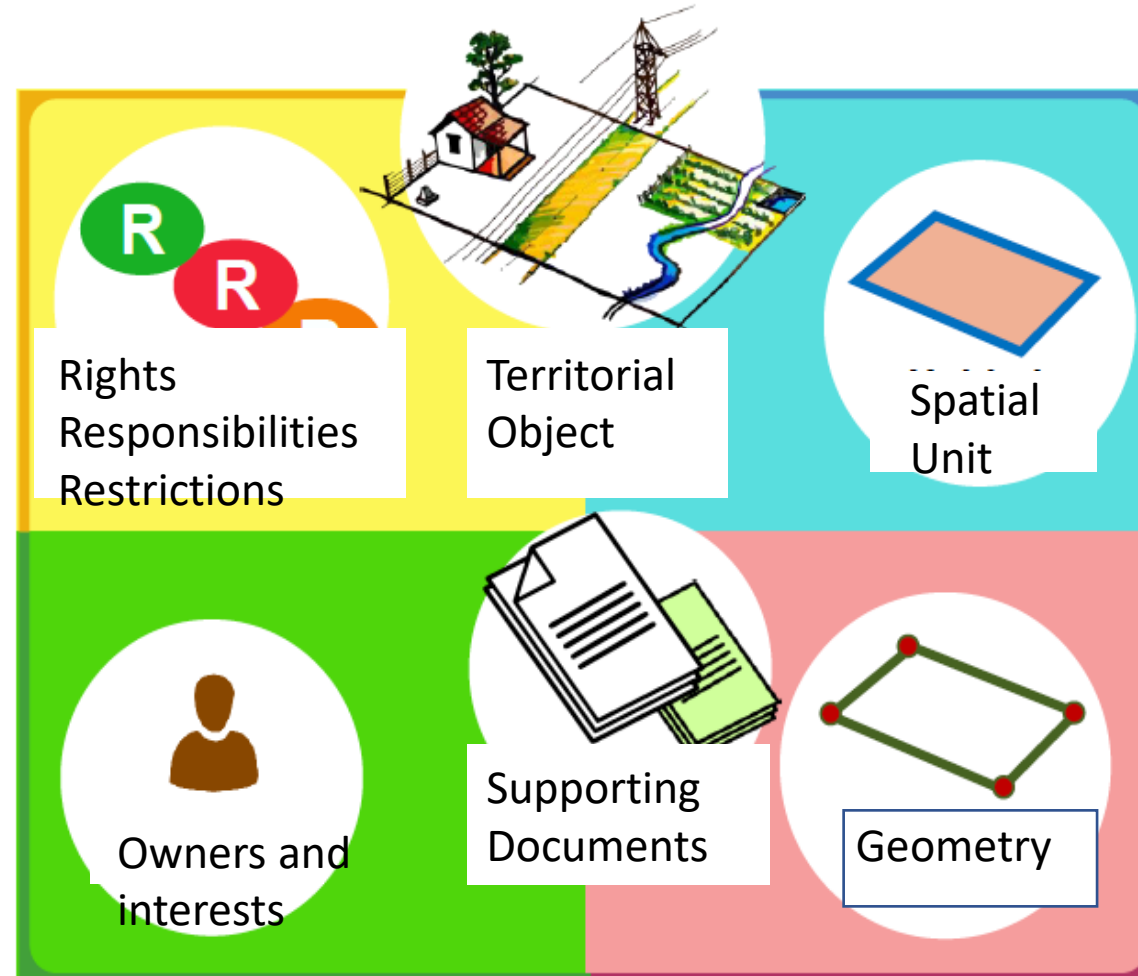
## Colombia: Functions of the Multi-purpose cadaster



Source: Government of Colombia

# Colombia Case Study

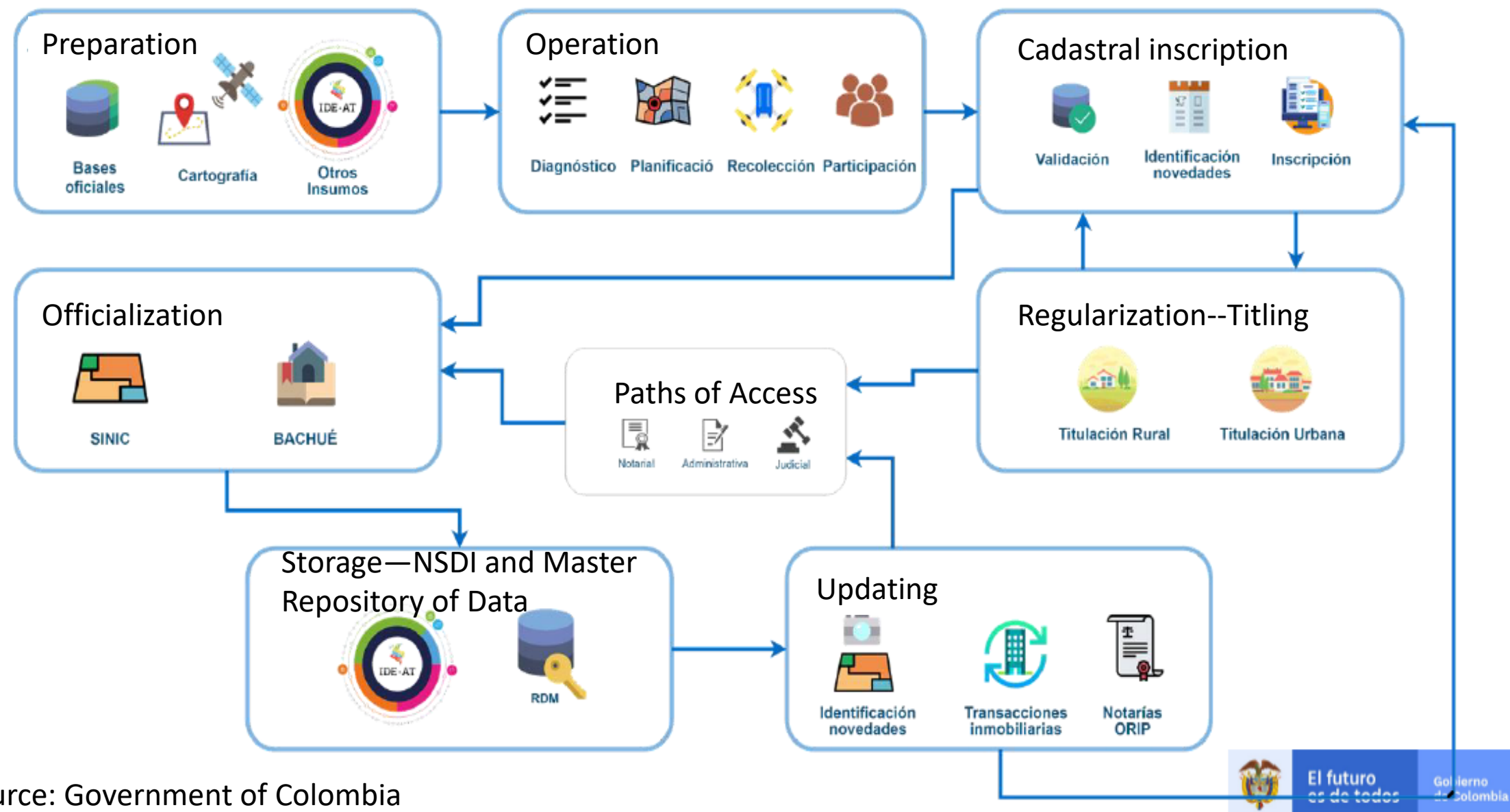
## Adoption of Land Administration Domain Model--Colombia



Source: Government of Colombia



# Colombia Case Study



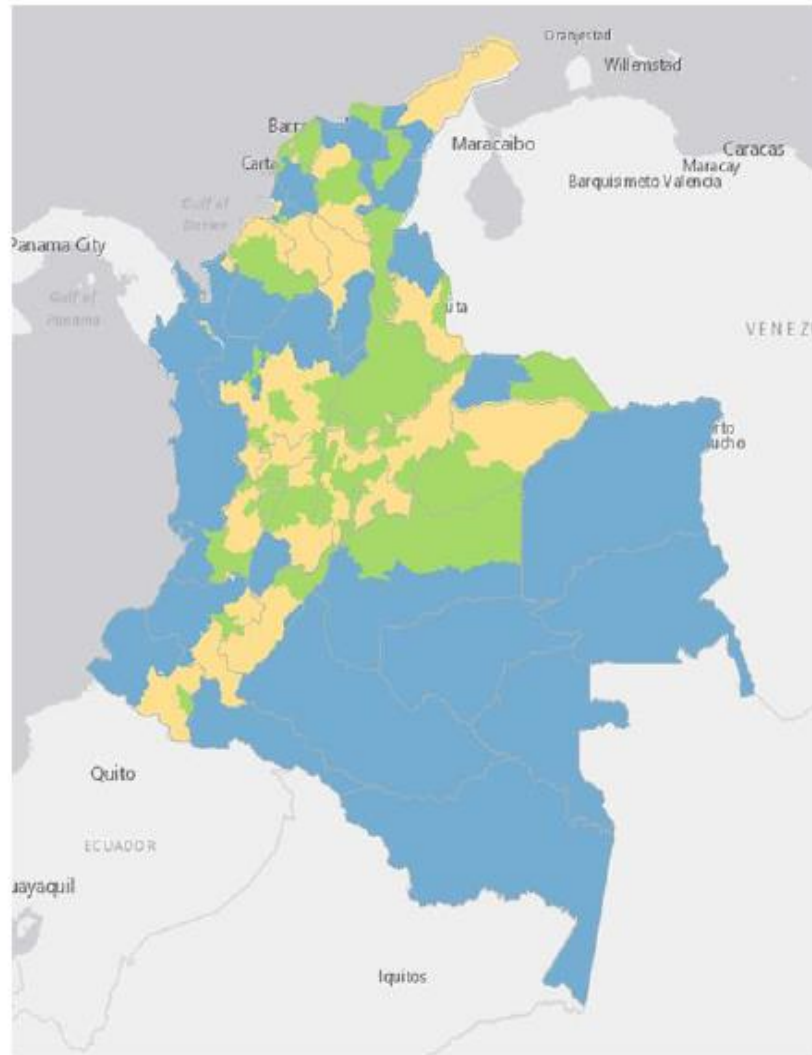
# Colombia Case Study



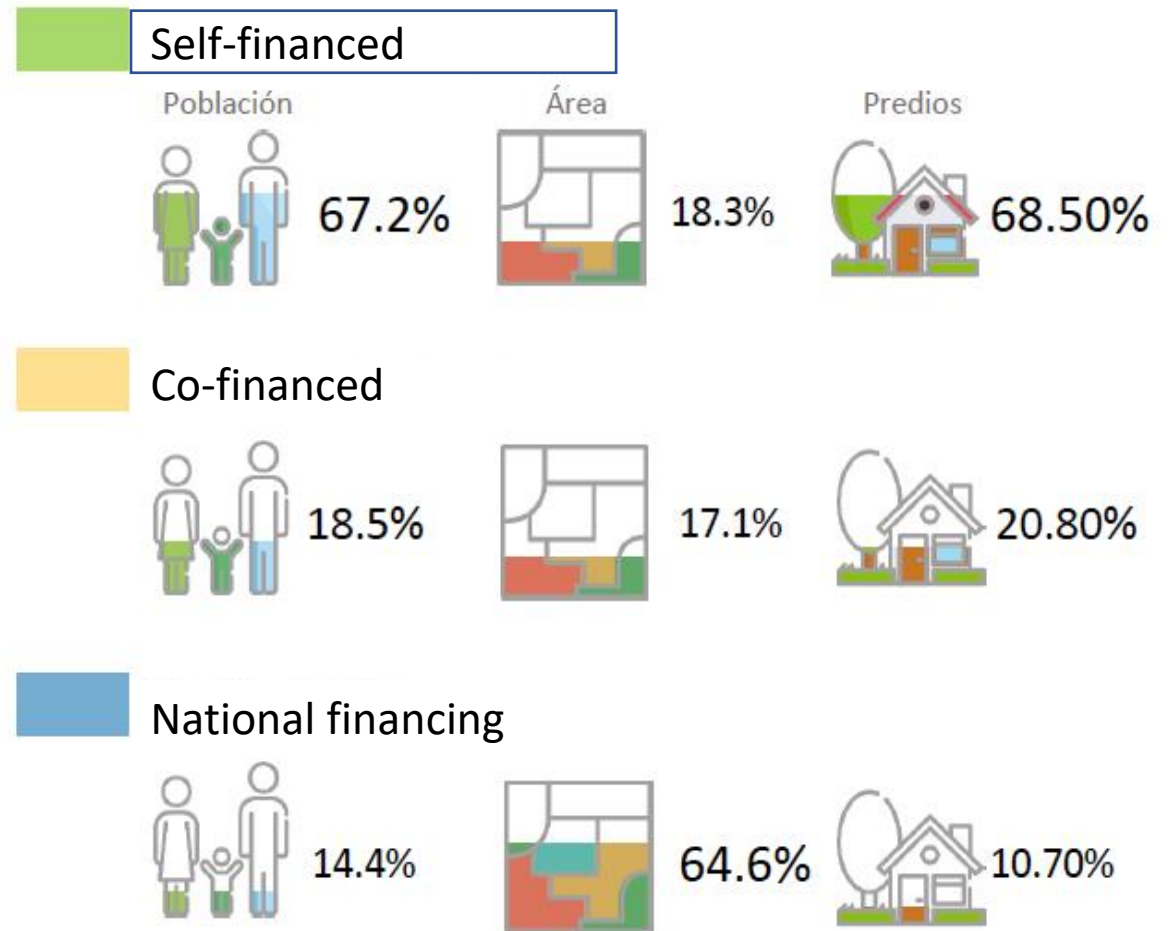
Source: Government of Colombia



# Colombia Case Study



## Territorial Capacity to Finance the Policy



Source: Government of Colombia



# Colombia Case Study

Initial parcel sweeps underway during 2020-2022 with Covid-19 protocols



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# Conclusions

Diverse governments are seeking to modernize property registration and cadaster through integrated solutions which offer the promise of supporting economic activity, local finance and social stability

Interoperability through data capture and standardization of data models offers potentials for gains in efficiency for both states and citizens, but it is neither simple nor quick

Field acquisition through new survey is an expensive and complex process, and new records must be maintained to make systems legally and financially sustainable

National-level, system-wide modernization is a long-term process with 20-year time horizons which calls for deep political commitments, planning for career paths and technological change, and a wide variety of inter-agency partnerships. This process is as much about management as it is about technology.

Obtaining the pay-offs in local efficiency of land markets and local tax revenue may require additional systems development in financial markets, mass valuation and local government capacity and may face political economy complexities.

Thank you for your attention and interest!

Special thanks to **Sedat Bakici** of TKGM  
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