



DIGITAL TRANSFORMATION FOR RESPONSIBLE LAND ADMINISTRATION

FIG Commission 7 & 2 Annual Meeting 2023

2-4 October 2023, Deventer



ADVANCES IN LAND ADMINISTRATION RESEARCH IN SPAIN: CURRENT SITUATION AND PROSPECTS

Angel Collado (Spain) 

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OPENING REMARKS

- PhD Student in Geomatics Engineering



- "Geolocation of land registries through genealogical and geodemographic studies at municipal scale". Only doctoral student in Spain doing research on land administration issues from the Geomatics field

- Teaching and research staff of Geomatics Engineering [Youngest Geomatics Professor in Spain]



- C7 Social Media Officer and C2 YSN Representative.



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Digital Transformation for Responsible Land Administration

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OPENING REMARKS

- PhD Student in Geomatics Engineering



- Awarded as the best doctoral thesis in development of the UPV (July 2022)

- Awarded with the national research award "Opportunity to Talent" by ONCE Foundation (December 2022)



- Awarded with the Queen Letizia national grant from the Government of Spain (May 2023)

- FIG Foundation 2023 Grant Winner



- ("Young Surveyor Grant Award" – FIGWW'23 Orlando)



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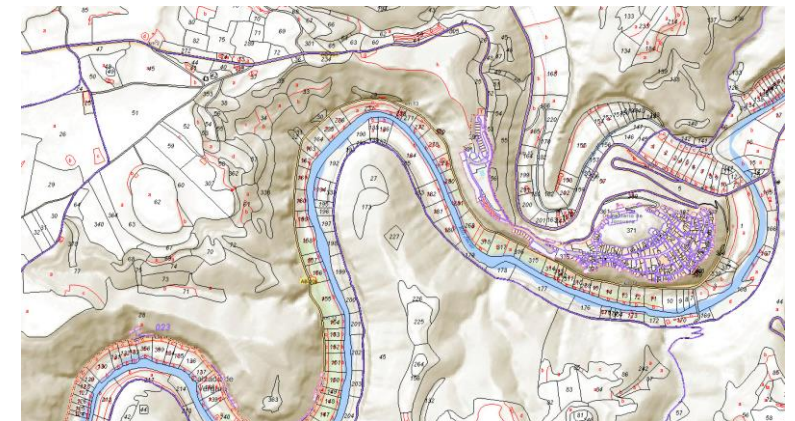
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INTRODUCTION

- Land Administration in Spain => Dual System
 - Cadastre: fiscal field or scope (taxs), with geometric graphic representation (all Spanish territory is mapped), whit an accuracy of +/- 2 to 4 meters in rustic parcels, does not provide titles or property rights.



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INTRODUCTION

- Land Administration in Spain => Dual System
 - Land Registry: legal field or scope, without geometric graphic representation* and with a literary description, provides property rights and security (VOLUNTARY, NOT COMPULSARY)



DESCRIPCIÓN

RÚSTICA.- PIEZA DE TIERRA, viña y campo, con olivos y algarrobos, situada en el término de Albinyana y partida Tomovi, actualmente parcela QUINCE, polígono CUATRO, del paraje Torrent de l'Abornar; de extensión aproximada dos jornales y siete céntimos, equivalentes a una hectárea veinticinco áreas noventa y tres centiáreas. LINDA: por Oriente, con doña Eulalia Mayner, viuda de Vidal, hoy sus sucesores; al Mediodía y Poniente, con Isidro Totossas; y al Norte, con Buenaventura Ricart, hoy don Juan Ferrer Nin.

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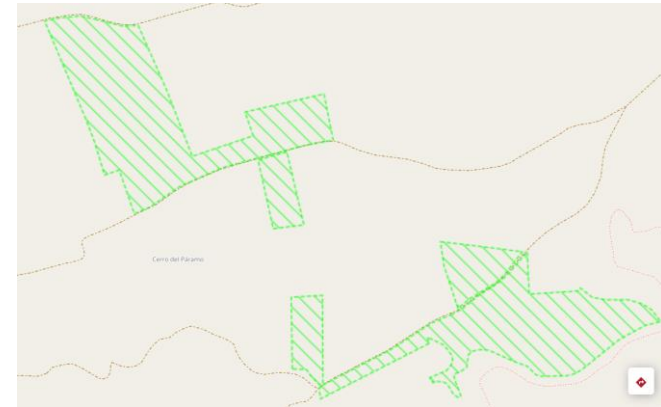
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INTRODUCTION

- Land Administration in Spain => COORDINATION
 - Law 13/2015: Geometric Coordination (Main purpose). Geometric cadastral representation into Land Registry => Coordination with reality is also desirable (cadastral and land registry updating).



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INTRODUCTION

- Land Administration in Spain => COORDINATION
 - Problem 1 => Individual case (Requested by the owner)
 - Problem 2 => Property titles not recorded in the Land Registry (Rural areas)
 - Problem 3 => Many registered and unregistered plots are not geolocated.
Where are they?
 - Problem 4 => Cadastral maps accuracy (for tax purposes) is not optimal for property delimitation.
 - Problem 5 => The majority of the professional staff in the Cadastre and in the Land Registry are not Geomatics Engineers (LA Education)

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CURRENT SITUATION

CADASTRE



- Lack of updating of cadastral titleholders ✘
- Large geometric errors. Rotated and translated plots ✘
- New formula for calculating the value of the property (reference value) more in line with the market price ↑
- First tests with 3D Cadastre ↑
- Digitized Old Cadastral Cartography ↑

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**Updating of
cadastral
titleholders**

47% of all parcels
35% area

PROPOSALS AND TRENDS

CADASTRE



- 4700 cadastral parcels
- 68 square kilometres
- 28 cadastral polygons

CASE STUDY



Unknown (tax) ownership

Deceased (tax) owners

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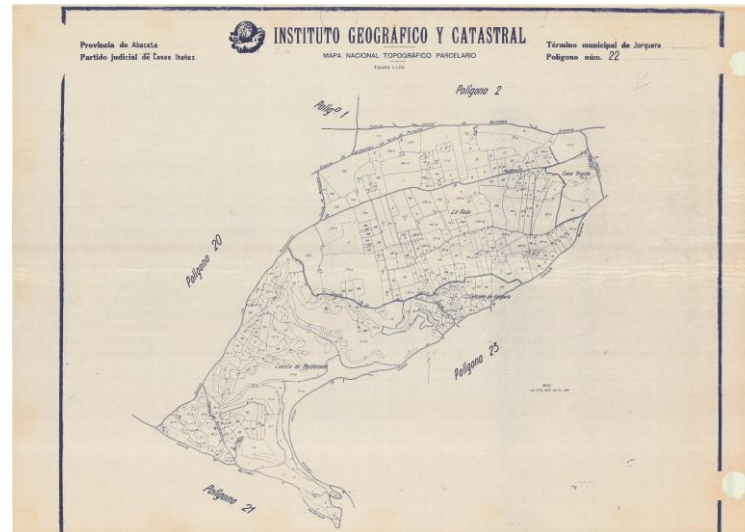


Georeferencing and vectorization of old cadastral maps

PROPOSALS AND TRENDS

CADASTRE

CATASTRO DE RUSTICA		ENTIDAD MENOR O SITUACION GEOGRAFICA		PROVINCIA		MUNICIPIO		CLAVE	
RELACION DE CARACTERISTICAS				ALBACETE		JURQUEÑA			
Foto adm.	EM	PARAJE	APELLIDOS Y NOMBRE	CB	SS	Calificación	Parcela	Alta	Superficie
				80	81	En libro	Número del libro	Año	Hec. 1/100
		H. Ciriano	Cano, Ciprián Juan			Productivo	1-00-0021	e	2 70
		id.	id.			Labor secano	05-0021	f	55 70
		L. Caligarron	Valiente Parra Pascual			Vino secano	1-00-0022	a	7 50
		id.	id.			Pisos	05-0022	b	1 70
		H. Ciriano	Cebrian Cebrian Antonio			Labor secano	05-0023	a	50 20
		id.	id.			Labor secano	05-0023	b	10 70
		id.	id.			Pisos	05-0023	c	2 50
		id.	id.			Pisos	05-0023	d	2 50
		id.	id.			Labor secano	05-0023	e	10 50
		id.	id.			Improductivo	1-00-0023	f	1 00
		L. Calizares	Rosco Piquero Sacramento			Labor secano	05-0024	a	10 00
		id.	id.			Pisos	05-0024	b	1 00
		H. Ciriano	Hernandez Languera José			Labor secano	04-0025	a	37 50
		id.	id.			Pisos	04-0025	b	10 00



CASE STUDY

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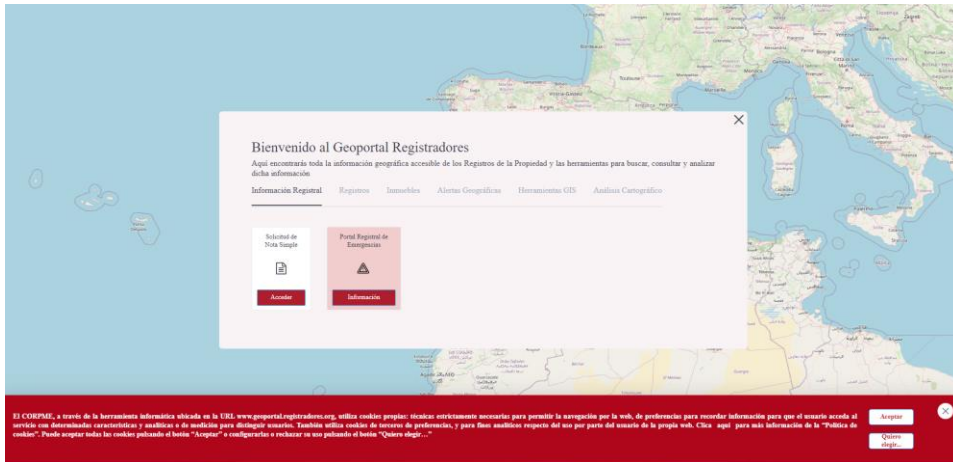
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CURRENT SITUATION

LAND REGISTRY



- Few legal geometries. Slow and voluntary coordination process. ❌
- Erroneous legal geometries by accepting cadastral geometry ❌
- Geoportal that allows geospatial analysis to know the legal limitations of each parcel. ✅
- The parcel layer is not public (cannot be used via WMS) ❌
- Emergency Geoportal. It allows to streamline processes when a fire, earthquake or flood affects a parcel of land. ✅

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Geolocation of land registries

PROPOSALS AND TRENDS

CADASTRE

RUSTIC. Piece of land (type of crop), located in the municipality of (**municipality**), toponym of the **rural area**, of extension (**area in hectares**). BOUNDED: to the **North** (name and surnames), to the **South** (name and surnames), to the **East** (name and surnames) and to the **West** (name and surname).

GIS tool with GeoAI

Approximate-global geolocation

Literally Georeferencing (Where?)
 Boundaries (North, South, East, West)

Land Registry Area

(Comparison with cadastral area)

Literally Georeferencing (With whom?)
 Adjoining owners

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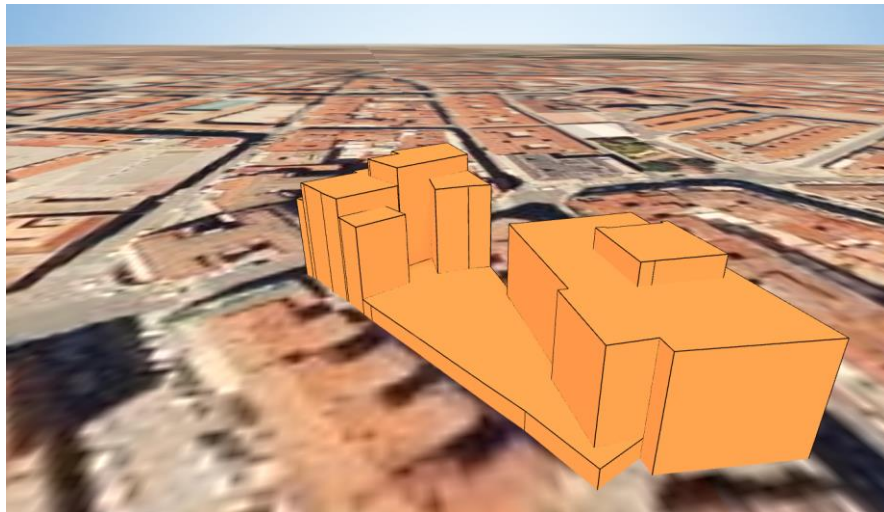
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PROPOSALS AND TRENDS

LAND REGISTRY



INSTITUTO NACIONAL DE ESTADÍSTICA

LISTA DE LOS ELECTORES DE LA SECCION

CENSO ELECTORAL 1975

Provincia Albacete Municipio Jorquera Distrito Segundo Sección Unión Hoja n.º 6

Condición	Apellidos y nombre	Dominio Calle y número	Sexo y edad	Estado civil	Profesión	Letra matr. y número
1 *	Ortega Jiménez, Filomena	Cubas, 62	M-37	Casada	S. L.	si
2 *	Ortega Jiménez, Marcelino	Cubas, 30	V-72	C	Subtilado	si
3 *	Ortega Jiménez, Margarita	Cubas, 31	M-39	Casada	S. L.	si
4 *	Ortega López, José	Cubas, 25	V-44	C	Peón agrícola	si
5 *	Ortega López, Justo	Maldonado, 11	V-41	C	Peón agrícola	si
6 *	Ortega López, Justo	Cubas, 25	V-19	S	Peón agrícola	si
7 *	Ortega López, Pedro	Maldonado, 29	V-32	C	Peón agrícola	si
8 *	Pardo Gómez, Juan	Maldonado, 27	V-20	S	Peón agrícola	si
9 *	Pardo Martínez, Joaquín	Maldonado, 27	V-50	C	Peón agrícola	si
10 *	Pardo Martínez, Isidoro	Maldonado, 25	V-63	C	Agricultor	si
11 *	Pérez Pardo, María Josefa	Maldonado, 21	M-60	Casada	S. L.	si
12 *	Ramos Cano, Adelina	Cubas, 25	M-45	Casada	S. L.	si
13 *	Riquena García, Leontina	Maldonado, 14	M-72	Casada	S. L.	no
14 *	Ruiz Corredor, Matías	Cubas, 23	V-46	C	Peón agrícola	si
15 *	Ruiz Corredor, Pedro	Maldonado, 12	V-54	C	Peón agrícola	si
16 *	Ruiz García, Carmen	Alcazarejos, 7	M-62	Casada	S. L.	no
17 *	Ruiz García, Marina	Maldonado, 9	M-56	Casada	S. L.	no
18 *	Ruiz Gómez, Adoración	Cubas, 28	M-59	Casada	S. L.	no
19 *	Sáez Medina, Isabel	Colindama de Vergara, 7	M-26	Casada	S. L.	no
20 *	Sáez Medina, Isidoro	Alcazarejos, 2	M-47	Casada	S. L.	si
21 *	Sáez Romero, Consuelo	Cubas, 39	M-35	Casada	S. L.	si
22 *	Sánchez Andújar, Domingo	Cubas, 48	M-35	Casada	S. L.	si
23 *	Sánchez Andújar, Efigenia	Maldonado, 29	M-29	Casada	S. L.	si
24 *	Sánchez Andújar, Isabel María	Alcazarejos, 13	V-36	C	Agricultor	si
25 *	Sánchez García, Blas	Alcazarejos, 2	V-49	C	Agricultor	si
26 *	Sánchez García, Juan Jesús	Maldonado, 18	M-53	Casada	S. L.	no
27 *	Sánchez Gómez, María	Cubas, 7	V-52	C	Peón agrícola	si
28 *	Sánchez Jiménez, Juan Antonio	Cubas, 3	M-56	Casada	Agricultor	no
29 *	Sánchez Jiménez, Isabel	Cubas, 1	M-71	V	S. L.	no
30 *	Soriano Jiménez, Natividad	Cubas, 1	V-21	S	Peón agrícola	si
31 *	Sánchez López, Antonio	Cubas, 46				

3D Municipal census of inhabitants and property owners

3D Land Administration (City Digital Twin)

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FUTURE PROSPECTS



Angel Collado (Spain)



FIG Commission 7
Cadastral and Land Management

Seeking a PhD research stay (3 months)

Working Group 7.1 – Framework for Effective Land Administration (FELA)

Working Group 7.2 – Fit for Purpose Land Administration (FFPLA)

Working Group 7.3 – LADM and 3D Land Administration (LADM/3D)

Working Group 7.4 – Artificial Intelligence for Land Administration (AI4LA)

Working Group 7.5 – Women’s Land Rights Advocacy (S4HL)

Working Group 7.6 – Digital Transformation for Integrated Land Management

Working Group 7.7 – Land Administration Education

Working Group 7.8 – Comparative Land Administration

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