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Possible Negative Legal Impacts on Cadastral Work Due to Lack of Perception on Spatial Uncertainty

Umit YILDIZ, Murat GÜREL, Sultan KOCAMAN, Türkiye
Jaap ZEVENBERGEN, the Netherlands



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Problem Definition

- Parcel-based registration → The area information is a derivative numeric attribute
- Accumulation of errors sourced from the overall processing chain
- Different uncertainty levels based on;
 - Production date
 - Surveying/modelling approach
 - Calculation method
 - Technical regulations and standards (thresholds)
 - Monumentation
 - Type of boundary definition (fixed or generic)

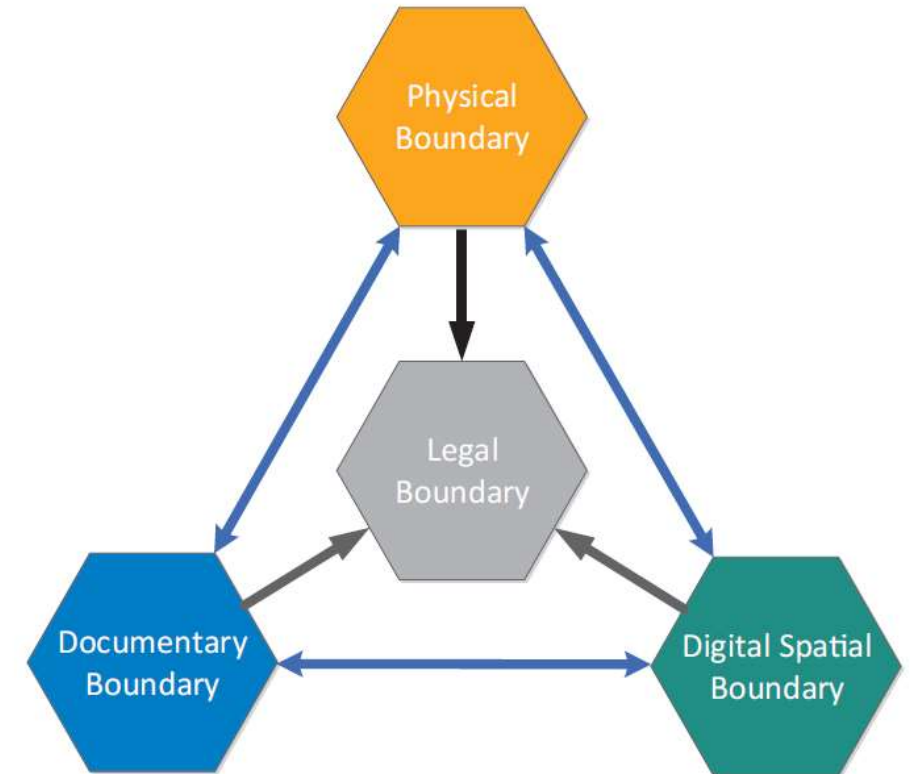



Parcel Area Calculations from Hatay Region in Türkiye (year 1932).

Problem Definition

- Errors in parcel area information in public registers include the measurement uncertainty.
- Differences are observed between parcel area records in official registers.
- Although the reality must come before the registers, legal entities consider the registers as facts.

Problem Definition

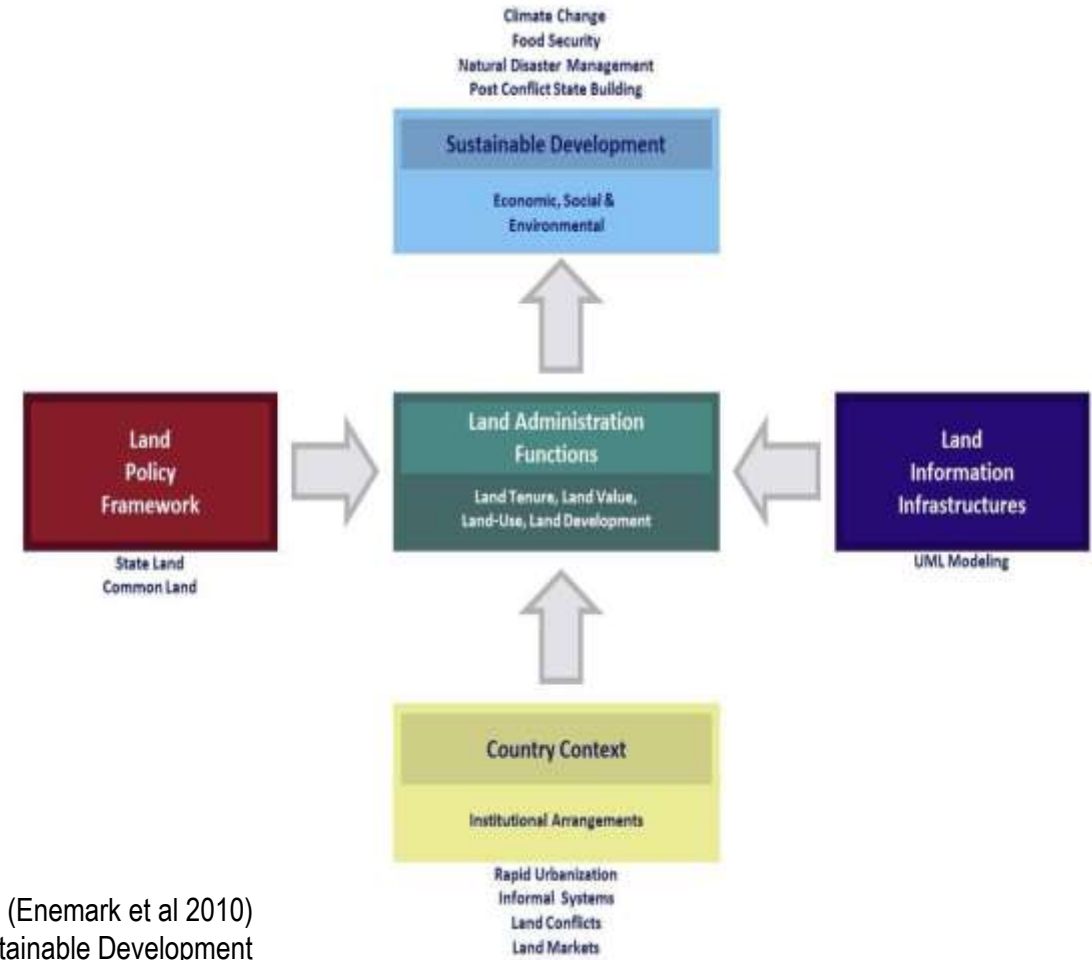


Grant, D., McCamley, G., Mitchell, D., Enemark, S., & Zevenbergen, J. (2018).

Problem Definition

Parcel Area Information is used for;

- Real property market
- Valuation
- Taxation
- Planning
- Urban and rural land readjustment projects
- Expropriation
- Agricultural subsidizing
- etc.



The land Management Paradigm (Enemark et al 2010)
Chapter 5 Land Administration for Sustainable Development

Lack of Perception on Spatial Uncertainty - European Court of Human Rights Decision dated 2015

- Application No: 40896/05 (Gürtaş Yapı Ticaret ve Pazarlama A.S / Türkiye) Applicant: Construction Company
- A clerical error was made by the technical officers when transferring the computed value from planimeter sheet to the related land ledger during systematic registration works in 1955
- Boundaries on the cadastre map were shown correctly
- ECHR decision → violation of the property rights' protection extent as defined in the Protocol 1 of the European Convention on Human Rights

Lack of Perception on Spatial Uncertainty - ECHR Decision – 2015

- ECHR → the reliance on the land registry also covers the registered parcel area (para. 55).
- the State is liable for incorrect parcel area information in the official registers.

Lack of Perception on Spatial Uncertainty – Turkish Court Decisions

- Turkish Constitutional Court → the State was held liable if there is a difference between the registered and the real parcel areas
 - If the property sale price is determined based on the parcel area, the party who suffers from a financial loss can be indemnified under State's liability rule
- Decisions of the Turkish Court of Cassation → Court of Cassation and the Constitutional Court converged to the ECHR case in recent decisions

Lack of Perception on Spatial Uncertainty – European Cases

Swiss Federal Court

1931 → the Swiss Federal Court did not accept the State's liability from the survey activities

1993 → whether the State or Cantons are liable for damages arising from survey

Germany (OLG Karlsruhe)

- the State is liable for damages, when the measurement carried out by the surveyor's office was false
- The Court considered the fact that sale price was determined based on the parcel area information obtained from an on-demand ground survey

Possible Negative Legal Impacts

- **Implications on**

- **Geospatial Professionals**

- The technical staff of the Turkish GDLRC and the external or emeritus geospatial professionals who have been involved in cadastral activities for several years, have been facing lawsuits for area differences.

- **Real Estate Finance Sector**

- the accuracy of the valuation

- **3D City Models and Digital Twins**

- The information about the area or volume of individual parts in complex or multilevel structures has been used in many applications, similar to the parcel area information.
- standards for floor area measurement

Conclusions

- Uncertainty always existed undoubtedly
- Expectations of the public from the registers have raised
- Technological advancements and open data tendencies curbed monopoly powers of land administrators.

Conclusions

- Spatial enablement can take the role of the middle man out and induce disintermediation
- Spatial uncertainty perception as a part of all these indicators is an essential ability for avoiding possible negative impacts for geospatial experts, land markets, financial institutions, and states.
- 3d registration and digital twins → the problems faced with traditional approaches will lead the challenges in determination and interpreting of complex spatial elements.

Thank you...