After the Disaster – Cadastral Processes to Re-establish Legal Security

Lukas Rammer, Gerhard Navratil and Julius Ernst
Overview

• Motivation
• Addressed Disasters
• Austrian Cadastral Procedures
• Response Requirements
• Procedural Responses
• Conclusions
Motivation (1)

• Events remind us from time to time that the earth is not stable

Source: blogs.agu.org

Source: Imst District Surveyor's Office
Motivation (2)

• Disasters cause
  – Destroyed infrastructure
  – Devastated private property
  – Unrecognizable parcel boundaries

• Recovery from disaster has (Alexander, 2010)
  – A political aspect
  – A technical aspect
  – A legal aspect

This is the cadastral focus
Addressed Disasters

- Austria is landlocked (no tsunamis)
- Large part of country is covered by mountains
- Main disasters
  - Floods
  - Mass movements
  - Earthquakes
Floods

- Regular risk in mountainous regions
- Strong flooding can become mudflow
  - potential to change landscape
- High economic damage (UBA, 2015)
  - Flood in 2002: 3.2 Bill €
  - Flood in 2013: 870 Mill €
Mass Movements

• Stimulated by natural processes
  – heavy rain, earthquakes, instability,..

• Either continuous or spontaneous

• Spontaneous
  – Boundaries before and after are static

• Continuous
  – constantly change shape and position of the affected parcels
Earthquakes

- Approx. 600 registered earthquakes / year in Austria
- Heavy damage every 75-100 years (Suda & Rudolf-Miklau, 2012)

Epicentres between 1900 and 2011 (© ZAMG, Geophysics)
Continuous movement

a severe problem for land owners and cadastral systems
constantly change shape and position of the affected parcels

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Continuous movement
Continuous movement and Cadastre

• Legal framework for the Cadastre since Dec. 2016 (!)
• How to deal with coordinate (= legal) Cadastre
• Clear procedure
• Technical framework
  – GNSS- measurement is obligatory
  – Additional measurements
Quality of the Austrian Cadastre

- Property tax Cadastre
  - ~ 60% coordinates, graphical boundaries,..
- Legal (coordinate) Cadastre
  - Coordinate based
    - signature by owners and surveying
    - Property boundary is legally binding
  - 16% of all parcels in “legal Cadastre” (coordinate Cadastre)
Relevant Cadastral Procedures

- Possibilities to solve boundary problems
- Coordinate (legal) cadastre: stake out boundaries
- Property Tax-cadastre redefine boundaries
  - Licensed surveyor + owner;
  - Coordinates, (old) surveying documents,
- Re- generation of cadastre
  - Leal process, creating legal (coordinate) Cadastre
- Land readjustment
  - for agricultural areas

- Coordinate-frame: physical control points + ETRS-coordinates
Conclusions

• technical and legal possibilities and difficulties in the reestablishment of cadastral correctness and legal security
  – time to legally binding solution is essential for land owners

• technical problems can be solved by storing coordinates in the ITRS

• Land readjustment based on land value before the disaster would allow this