



THE FUTURE OF THE CADASTRE

IN RECENT YEARS, SCENARIOS AND VISIONS HAVE BEEN DEVELOPED ABOUT HOW THE CADASTRE MIGHT DEVELOP. THERE ARE SIMILARITIES, BUT ALSO DIFFERENT PERSPECTIVES. **DANIEL STEUDLER** PROVIDES AN OVERVIEW OF THE DEVELOPMENTS, PUTS THEM INTO A LARGER CONTEXT – AND DRAWS SOME CONCLUSIONS

The main purpose of cadastral systems is to document the extent of landownership rights in a transparent, sustainable and trustworthy way. But cadastral data is increasingly being collected digitally, so it is being used for many other purposes as well. At the same time, other digital geospatial data is playing an increasingly important role for e-governance. Therefore, the whole geodata sector is evolving into a digital service provider for society.

Cadastral systems around the world are trying to find their role and position in these developments, and many cadastral authorities are starting initiatives to look to

their future. For example, in New Zealand in 2014, the national authority Land Information New Zealand developed a 20-year strategy, Cadastre 2034. The vision formulated therein is to make it easier for citizens to understand what their land rights are, including restrictions and obligations, and to visualise them in three dimensions. The basic assumption was that digital technology, positioning technology, databases and mobile devices will play a decisive role.

Inspired by New Zealand, Australia also developed a national strategy, Cadastre 2034, in 2015. The Australian vision for

2034 is consistent with New Zealand's: 'The cadastral system in 20 years' time will enable citizens to readily and confidently identify the location and extent of all rights, restrictions and responsibilities related to land and real property.'

The strategy put economic figures on land ownership, suggesting that in Australia in 2014, the total value of all real estate was about AU\$5.2tn, while housing loans secured against land titles totalled AU\$1.4tn, the annual GDP being AU\$1.6tn. From this, it indicated how a well-functioning cadastral system can bring improvements in investment security and economic sustainability: investor confidence can be enhanced by mortgage-backed securities when cadastral and land register systems are more closely linked to financial and equity markets; decision-making in land management and development can be improved by digital cadastral data; and productivity across the agricultural and utilities sector can be enhanced by digital and efficient processes.



- Data as the basis of the digital revolution (geodata science as a new direction for education).
- Meta-platforms for a high level of market dominance (making geodata and services available to third parties).
- Revolutionising registers through the use of blockchain technology.
- Administration through variable geometries (data as a basis for smart cities governed by a multitude of bodies responsible for different realms).

Future scenarios in land administration

Since 2018, the UNECE working party on land administration has been working on a study to understand the various developments and trends in land administration and cadastre and thus to contribute to national long-term strategies. Different technological developments are also being taken into account.

The study is based on 11 ‘megatrends’, such as demographic change, social disparities, digital transformation, volatile economies, business ecosystems, decentralized environments, new political world order, global/regional power shifts, and urbanisation. It attempts to recognise

There are now several innovative approaches being taken to accelerate the rapid identification of property boundaries using new technologies such as GPS, orthophotos and field-ready tablet computers.

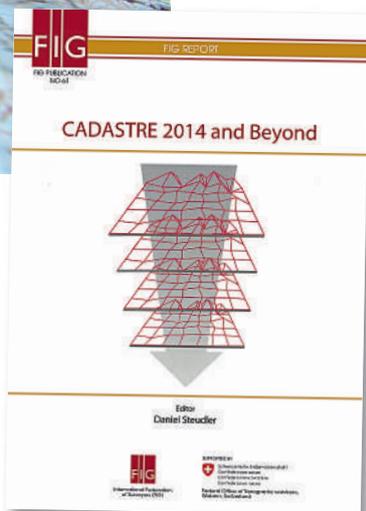
The importance of securely documented land ownership is also reflected in the fact that the United Nations’ sustainable development goals include 12 indicators in which the spatial land component is important. These include the security of land ownership, security for small farmers, agriculture and forestry, securing women’s land rights, access to adequate housing, biodiversity, and land degradation.

In addition to cadastral data, other national geodata sets are being collected and maintained. To benefit from these, they must be shared and integrated. Interoperability is therefore crucial and spatial data infrastructures (SDI) are being set up to enable sharing of and access to all the various data. The benefits are primarily economic, as the state can thus manage its land more efficiently and better plan its use. Cadastral data is recognised as a central element.

Conclusions

In view of the international developments in the geodata and cadastre field, the general impression is that the exchange of geodata between institutions is only now coming to the table. The age of data silos is ending and concepts for common data integration are in big need.

A WELL-FUNCTIONING CADASTRAL SYSTEM CAN BRING IMPROVEMENTS IN INVESTMENT SECURITY AND ECONOMIC SUSTAINABILITY



Above: When looking at future scenarios for cadastral systems a distinction must be made between developed and developing countries. © Béatrice Devènes/swisstopo

Right: The basics related to the future needs of the cadastre have been set out in the FIG publications *Cadastre 2014 and Cadastre 2014 and Beyond*

The Swiss think tank

In Switzerland, a continuous development of the cadastre is described as “extension of the dimensions”. It is mainly legal dimensions that are being added at the moment, with the creation of the cadastre of public-law restrictions of landownership (PLR cadastre) and initial studies including easements. Geometric dimensions, including a cadastre of underground utilities and a 3D cadastre, will probably also be added.

These developments are mainly triggered by the density of the country, the evolving demands of society, and the technological possibilities.

Cadastral surveyors in Switzerland established the think tank ‘Dimension Cadastre’ a few years ago. This has formulated four challenges for the future of the cadastre, each supplemented with recommendations, relating to:

their impact on national cadastral systems, which is a relatively difficult undertaking, but there seem to be clear indications that they will require a review of the original foundations of cadastral systems and to reemphasise them again.

The study suggests four development scenarios, defined by the two axes ‘traditional hierarchical’ versus ‘digitally enabled ecosystems’ and ‘public’ versus ‘private involvement’. The four scenarios are ‘conventional land administration (LA)’, ‘as-a-service LA’, ‘platform LA’ and ‘distributed LA’. More detailed descriptions and the final report are being prepared for publication.

Different priorities

The establishment of a functioning and reliable cadastral system has an even higher political priority in developing countries than in developed countries, as the reliable and trustworthy documentation of real-estate rights plays a central role in the sustainable development of a society in many respects.

However, solutions exist and have been in use for many years. For example, in Switzerland, the cadastre had to find a solution for unhindered and efficient data exchange, due to the federal structure of the country. The need in a federated system for transferring data from one administrative body to another – horizontally and vertically and with 0% information loss – was essential. The adopted concept for data description and exchange was a model-based approach based on a description language, which today represents the foundation for Swiss SDIs. In other mainly centrally organised countries, the problem of data exchange did not arise initially. Only today, when comprehensive SDIs are to be established, has data exchange become a topic of discussion..

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