

The Swiss Approach of Integrated Land Administration and Land Management

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Key words: land management, cadastre, land administration, cyclic land management process, education of land professionals

SUMMARY

Sustainable development – in economic, social and environmental terms – is the product of stability in land issues. This stability includes reliable land administration, transparent land management, and a legal framework, providing the basis and allowing free access to land for all.

This paper provides an insight in the way of how land issues are being dealt with in Switzerland, a densely populated country that has enjoyed not only political stability, but also a well-balanced land policy for many decades. This is the result of sound land administration and land management principles taking into account the federative and decentralized political and administrative structures that have been applied over a long time, and also of an education and a licensing system that are based on an integrated approach.

Those principles will be investigated and described mainly with the purpose to illustrate how they helped Switzerland to prosper and how they might offer solutions for other countries. It will be argued to bring geomatics and land management education closer together in respect of an integrated approach. Land administration is not an issue in itself, but a contribution to the solution.

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1. INTRODUCTION

Switzerland's long tradition with private and common land ownership began long before the French revolution. This tradition was the reason for a certain hesitation to accept the new principles. But finally the country made a big effort and took the lead in Europe by creating a new land code fixing the most modern guarantee of ownership.

In parallel Switzerland was able to develop modern surveying technologies and high precision instruments thanks to the watch production supported strongly by Huguenots.

So rights to land and the techniques and tools to document them and to reallocate them were available soon and formed the base for the development of a modern land management paradigm.

2. HISTORY OF LAND MANAGEMENT IN SWITZERLAND

2.1 Early land reform experience

The first land reforms in the territory of Switzerland took place in the reigns of Charles the Great and Otto the Great who played also an important role here in Rome. The land ownership developed over the centuries and nowadays we have a system where the land is owned by natural and persons equal before the law. There is no state property because authorities are considered as normal legal persons.

2.2 Land improvement experience

The World Wars where Switzerland was lucky to keep out forced special efforts in self-sufficient food production, especially when the axis surrounded Switzerland totally in WW II. In these times the methodology, processes and techniques for land improvement were brought to a very high level. The surveyors as land professionals delivered successfully the respective services to the Swiss society.

Unfortunately these skills and the respective position diminished during the cold war period and nowadays we suffer from a lack of engineers in general and land engineers in particular. Too long was the profession sticking to the agricultural aspects of land and neglecting the new needs coming from environment protection, land use planning, resource management, etc.

2.3 Land management needs

However the need for integral land management including all aspects of land use, land and environment protection, sustainable consumption of resources was identified by colleagues thinking ahead and guidelines for Modern Integral Amelioration were developed and tested in a public-private partnership initiative. These guidelines proved to be feasible but not applied

too often because this tool for resolution of conflicting demands to land fell into oblivion. To correct this, in many new laws e.g. the law on the national highways, the law on the national railways, the law on the airports, the laws on physical planning, the possibility to use modern integral ameliorations to prepare the land resources for respective projects was introduced. The legal cascade for land development in Switzerland is: direct purchase -> integral amelioration -> expropriation.

The necessity of land management tools to achieve sustainable development is obvious. Still there are some obstacles to be overcome and geosuisse works hard to improve the situation.

3. ACTIVITIES IN OF GEOSUISSE

3.1 Definition of the fields of activities of the land professionals

geosuisse has formed a think tank which shall study fundamental professional questions and elaborate proposals for action by the board and the members. To clarify the terminology and to prepare a clear base for discussions, geosuisse asked this think tank for a definition of the fields of activities. The result is shown in figure 1.


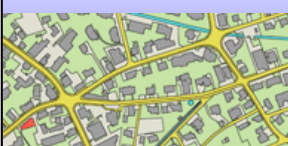
Tasks	Land related activities	Tools / Methods
Strategy <ul style="list-style-type: none"> visions and objectives 	Land policy	<ul style="list-style-type: none"> political activities
Management <ul style="list-style-type: none"> measures and projects for the implementation of the policy 	Land management 	<ul style="list-style-type: none"> land-use planning land consolidation land reallocation melioration landscape development land recycling
Administration / Documentation <ul style="list-style-type: none"> handling of spatial information, data analysis, data visualization cadastral operations, data modelling, data acquisition, data maintenance, data distribution 	Land administration and cadastre 	<ul style="list-style-type: none"> monitoring navigation geoinformation land registration cartography surveying geodesy

Figure 1 Fields of activities of the Swiss land professionals

geosuisse is convinced that an integrated approach is the only way to achieve sustainable development. Based on the reliable cadastre documenting doubtlessly the situation of land and with efficient land administration methods for preparation the bases for decisions, land management can be carried out successful. For a successful realization of the measures proposed in the land management process it is necessary to validate the results by actualization of the

documentation. Only when the new situation is doubtlessly documented in the updated cadastre the land management is implemented successfully.

We describe this creed by the cyclic process of land management in figure 2.

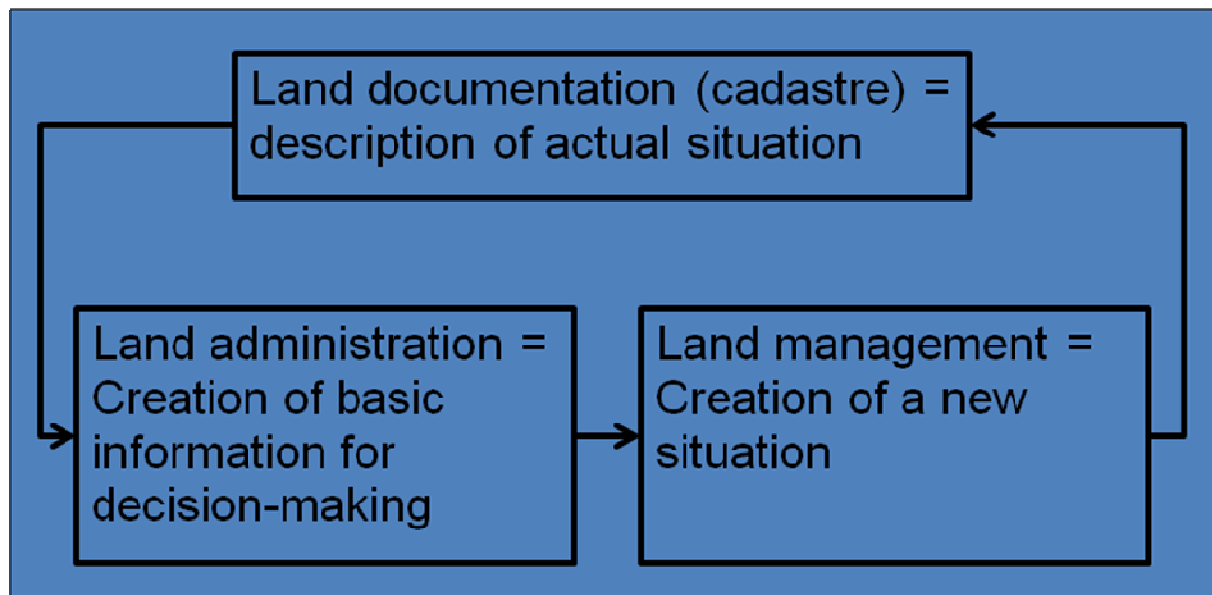


Figure 2 Cyclic land management processes

3.2 Support of recruitment of land engineers

Like most of the developed countries we suffer from lack of adequately educated engineers. geosuisse elaborated a report on the academic education of land professionals describing the existing situation and proposing measures for improvements.

The proposals foresee improved cooperation between the associations and the schools; improvement of public awareness by opening the offices to the public and better explaining the role in the society, information blocks in classes leading to academic studies, proposals for thesis's and research by the practicing professionals and proposals for adaptation of curricula to the needs.

3.3 Support for development of curricula

Despite a rather difficult situation in the Swiss educational system geosuisse was lucky to support the development of a curriculum for a master study in land engineering (Master of Science HES-SO en Ingénierie du territoire) which gives the successful graduates access to the state exam for licensed surveyors (Figure 3).

The course profile is defined by the individual student with the support of a mentor from the teaching staff, and with the agreement of the MIT course director. The MIT is a specialized course involving subjects connected with developed land and the built environment: Advanced and practical geomatics, law and cadastral surveying, construction and loadbearing structures, water, soil types, the environment, transport and mobility, land and landscaping.

Master

Ingénierie du territoire (Geomatics, land management and civil engineering MIT)

Qualification awarded
Master of Science HES-SO en Ingénierie du territoire

Description
The course is made up of two parts:

- Theoretical and professional specialisation (60 ECTS)
- Master's thesis: AR&D project supervised by a member of the teaching staff (30 ECTS)

The accent is as much on developing personal, methodological and entrepreneurial skills as on acquiring technical knowledge. The MIT course also enables students to select a profile that gives them the theoretical basis for admission to the examination for the Swiss vocational examination (brevet fédéral) as a surveying engineer.

Figure 3 Master course for land engineers

4. JOINT ACTIVITIES OF PUBLIC AND PRIVATE SECTOR STAKEHOLDERS

4.1 Public awareness campaign on the occasion of the centenary of cadastral surveying

1912 the Swiss Civil Code was put into force. This occasion is taken as an opportunity to improve the knowledge on the role of the profession and the land professionals.



Figure 4 Festschrift for the centenary

During the whole year the cadastral surveying is present at interesting places in the capital and in all cantons. May 12 is the Day of the Swiss Cadastral Surveying. The offices present themselves in exhibitions or days of the open door. Schools have special events. A stamp has been created and a lot of promotion material will be distributed.

4.2 Introduction of the Cadastre of Public-law Restrictions of Landownership (PLR)

No one who owns land in Switzerland can simply use it as he wishes. One has to comply with conditions laid down by parliament and by the authorities. And this means complying with a multitude of acts, ordinances and official restrictions – so-called Public Law Restrictions on Landownership Rights (PLR). Until now, it has not been particularly easy to obtain all the information relevant to a specific parcel of land.

Because a variety of authorities may be involved in the restrictions, a time-consuming trek from office to office is often needed. But now the PLR cadastre offers a solution. In this new cadastre, the most important restrictions that apply to each parcel of land are compiled in a reliable and transparent manner.

The PLR cadastre is being introduced in two phases. By 2015 first five cantons will have introduced the PLR cadastre. The remaining cantons will introduce the Cadastre by 2019. The content of the PLR Cadastre is shown in figure 5.

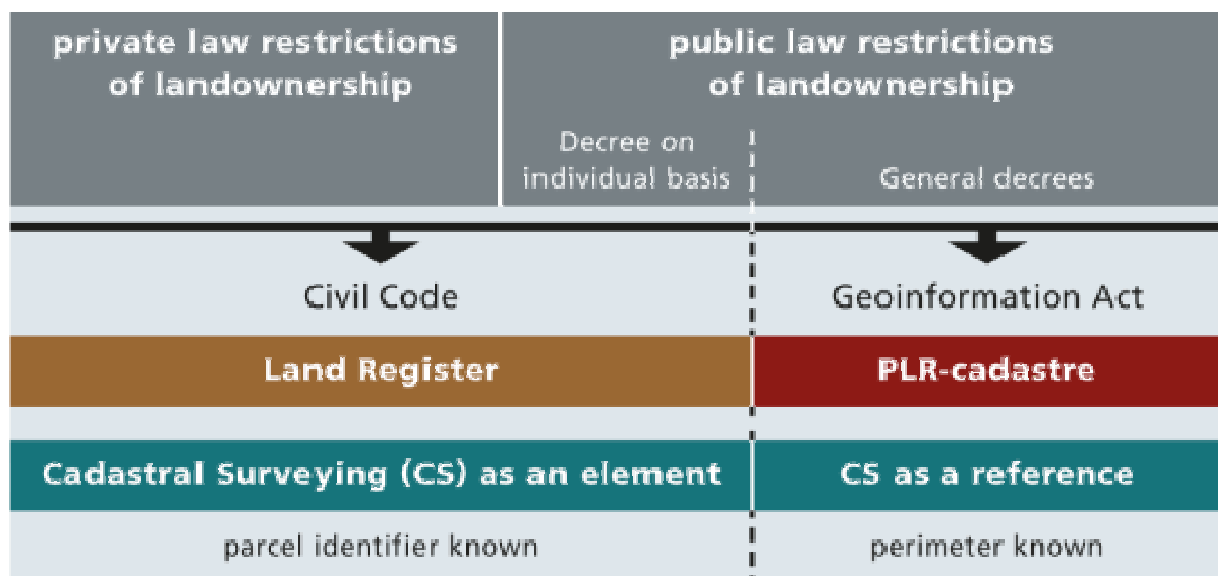


Figure 5 Information in the PLR-Cadastre

geosuisse supports this work which improves the integrated system for land matters. The base for the PLR-Cadastre was laid by Swiss professionals in the FIG Publication Cadastre 2014.

4.3 Platform for international assistance in land management

A functioning land market is a sound base for economic development and missing information on land rights hampers the land market as well as the efficient assistance after disasters or conflicts. Haiti is an example for the latter. Following the implementation of a cadastre the need for re-arrangement of land rights comes up immediately because different problems await solutions which can be achieved with sustainable land management.

The well developed methods, procedures technologies and techniques of an integrated land administration and land management tools can support sustainable achievements. geosuisse therefore supports the efforts for international assistance in land management by being a member of the SWISS LAND MANGEMENT FOUNDATION aiming at delivery of interna-

tional assistance services. See figure 6.



Figure 6 International activities

The foundation helps the members to participate in the international land management market and helps to implement integrated solutions.

5. CONCLUSIONS

Land is an important economic asset for individual people and whole countries. This is underlined by the fact that in Switzerland credits of more than 700 billions Swiss Francs are secured by mortgages on land which are based on the reliable cadastre. The functioning land market is a requisite of the Swiss prosperity. The cadastre is an essential precondition for all activities concerning land and can be implemented with the highly developed technologies and methods very quickly. With the well developed land management tools sustainable solutions can be found and validated with the help of an integrated land management paradigm.

Switzerland's sound and long time experience in land engineering have produced successful results so far. We are ready to share the knowledge and experience with colleagues and governments in other countries. A long tradition of thoroughness, loyalty and endurance shall be carried on.

This is a reason why the Swiss Guards here in Rome protect the pope since 1506. And in 1815 in the Vienna Congress we have been commissioned to keep the transverse of the Alps open. That's why you can pass the Alps without tolls by the Gotthard base tunnel which was cut off with a deviation of a hand due to the reliable precision work of the Swiss professionals.

BIOGRAPHICAL NOTES

Rudolf Küntzel graduated from the Swiss Federal Institute of Technology in Zurich (ETHZ) in 1975 and earned the Swiss license for licensed land surveyor in 1983. He started his professional career as an assistant at the Institute of Rural Engineering at ETHZ (Prof. Grubinger ICID) and participated in the ICID Congresses in Athens and Morocco. From 1981 until 1984 he worked in a private Office of surveying in the mountainous Canton of Graubünden. He started his own business in 1984. His office is dealing with Cadastral surveying, land management and engineering survey. He was elected in 1990 member of the board of geosuisse, the Swiss Association for Geomatics and Landmanagement and took presidency in 2010. Rudolf Küntzel takes care of the land management portfolio and organizes a yearly land management conference at ETHZ. He is also the project manager for the restoration of a 5th century Celtic cultural monument in the central Alps.

Jürg Kaufmann graduated from the Swiss Federal Institute of Technology in Zurich (ETHZ) in 1967 and earned the Swiss license for licensed land surveyor in 1981. He started his professional career as an assistant at the Institute for Land Consolidation at ETHZ, became the CEO of an IT Service company. He returned to the ETHZ 1979 as a Senior Assistant and 1981 he took the position of CEO at a big Swiss Surveying company. After having been appointed a member of the Steering Board for the Swiss cadastral reform project he founded 1988 KAUFMANN CONSULTING providing advice in the field of modern Cadastre, Land Administration and Landmanagement for public and private sector clients in Switzerland and abroad. His work covered the Principality of Liechtenstein, Belarus, Ukraine, Georgia, Kosovo, Serbia, Korea, Montenegro, Macedonia, Azerbaijan and the Kingdom of Saudi Arabia. In FIG he was a long time the delegate to Commission 7 where he elaborated the Vision Cadastre 2014 in the years 1994-1998. In 2006 he became a honorary member of FIG and in 2010 of geosuisse, the Swiss Association for Geomatics and Landmanagement which he presided from 2003 to 2010.

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