sistemelor de coordonate regionale utilizând tehnologiile moderne. Agenția de Stat Resurse Funciare şi Cadastru. Chişinau, Iunie 2003, 5 p.
9. Chiriac, V. Pantikin, V. Krauterbluth, K.W. Ilies, I. Crețu, I. First Order Gravity Network of Republic of Moldova. Proceeding of the 1-st International Gravity Field Service "Gravity Field of the Earth", Istanbul, September, 2006, ISNN 1300-5790, 420-423.
10. Chiriac, V. Continuously Operating Reference Station Network - A Future Strategy for Republic of Moldova. Proceeding of EUREF Symposium, Riga, 2006
11. Jäger, R. and R. Gyenes (2009): Deformation Integrity Monitoring for GNSS-positioning services inclduing a scalable hazard monitoring by the Karlsruhe approach (MONIKA). Proceedings of the International Symposium on Global Navigation Satellite Systems, Space-Based and Ground-Based Augmentation Systems and Applications. Berlin, 11-14 November 2008. Berlin Senate Department for Urban Development. Berlin. ISBN 978-3-938373-99-6. p 106-107.
12. Jäger, R. and R. Kälber (2008): The New RTCM Transformation Messages. RTCM Paper No. 110-2008-SC104-508 .
13. Chiriac, V. National Report of Republic of Moldova. Proceeding of EUREF Symposium, Riga, 2006,
14. Chiriac, V., Gravimetrie geodezică. Metode terestre a determinărilor gravimetrice. Curs de prelegeri, UTM, Chişinău 2006.

CZU: 332.2(474.3) Pa607

DEVELOPMENT OF CADASTRAL SYSTEM IN LATVIA

V. PARSOVA
Latvia University of Agriculture, Latvia

Abstract. Целью статьи является исследование процесса создания кадастровой системы, обобщение исследований по развитию кадастра, оценка теоретического и практического вклада создателей новой кадастровой системы недвижимого имущества после восстановления независимости Латвии в 1991 году. В Латвии на базе ранее существующего опыта и перенятия методов других стран ведения кадастра создана современная и эффективная система регистрации, состоящая как из текстовой части так и из кадастровой карты. Государственная кадастровая система является эффективным средством защиты прав на недвижимое имущество и обеспечивает условия для регистрации недвижимого имущества в Земельную книгу (Land Register).
Key words: Cadastral map, Cadastral system, Land parcel, Real property, Real property cadastre

INTRODUCTION

In the article is scientifically grounded the necessity of cadastral system in restored independent Latvia, comprehensively evaluated compliance of cadastral solutions to specific historical conditions and strengths and weaknesses of the chosen solutions, and described the achieved results. The new national cadastral system was developed according requirements of the state, evaluating the positive

and negative aspects of formerly existed cadastres in the territory of Latvia including the soviet period cadastre and experience from other countries.

The legal basis for registration of real properties as components of state cadastre was created in 1991, by adopting the law "On land use and land management". With this law the concept, its content, tasks and procedure of maintenance of national land cadastre was established, charging the State Land Service with the duty to develop, implement and maintain national cadastre of land and other real properties. At first the national cadastre consisted of register of land assigned for use, cartographic materials of cadastre, data of land recording and land valuation. Subsequently by legislation also buildings and structures that were not owned by the same owner as the respective land and apartment properties were defined as independent real properties. The requirements regarding the maintenance of cadastre were applied to these properties as well. The task of the cadastre information system was to furnish state institutions, local governments as well as landowners with information on real properties in the whole country. Its task was – maintenance of cadastral data necessary for natural and legal persons, state institutions, local municipalities and relevant information systems.

It had to be organized in a way that enables use of acquired data and materials also for state cartographic works, statistical purposes, for organization and forecasting of production and for taxation purposes (M.Eglītis, H.Kanaviņš, 1998).

MATERIAL AND METHOD

The article is based on the research and publications on national real property cadastre of Latvia published by the author over a long period of time. Laws and decrees of Cabinet of Ministers regarding cadastre and real properties were widely used. Also the professional literature on cadastre, its cartographic and textual part, on use of computerised methods in maintenance of cadastre published in Latvia and abroad was used. Activities of the State Land Service in development, implementation and maintenance of cadastre and the relevant information system were analysed.

The article was prepared by employing inductive and deductive methods, method of logical analysis and historical research as well as comparison of various cadastral systems. Different generally accepted methods of economic research are used.

RESULTS AND DISCUSSIONS

Reorganization of agriculture in Latvia began already in the soviet period (in 1988), when the law "On peasant farms" was adopted. Wherewith the legality of individual work in agriculture was acknowledged alongside with use of agricultural land by kolkhozes and state-owned farms, by assigning land for use to peasants with possibility to transfer land use rights to their heirs. Materials of Land Commissions showed: in the end of 1988 51 peasant farm with total area 742 ha were formed, but in the end of 1990 - already 7 thousand peasant farms with total area 152 thousand ha.

Great activity and interest in acquiring the land for use and subsequently in ownership in the result of adoption of land privatisation laws confirmed that Latvia was undergoing a transition from economy of socialism, where comparatively little number of agricultural companies with large land areas were the economical

subjects, to market economy system, where there is a huge number of comparatively small land properties. This transition period was marked by rapidly changing and varied structure of land use; besides, the borders of properties were continuously changing. In order to acquire overview on the pace and speed of land reform, land distribution according to groups of land users and owners, state and local government institutions required the respective information. Accordingly it was necessary to ensure a procedure for registration of newly formed land assigned for use. This issue in Latvia is comprehensive investigated by researchers A.Boruks, M.Eglītis, H.Kanaviņš, I.Lukss, V.Parsova, etc.

The ideas regarding the cadastre system to be developed was provided by training in Swedish institution "Swedsurvey" in the beginning of 1991 offered to specialists from Baltic countries – Estonia, Latvian and Lithuania. The Swedish side provided theoretical as well as practical information on their cadastre system, tasks of cadastre, organizational and technical issues of its maintenance (Ericsson A., 2001). The purpose was to find out, which experience could be adopted for development and improvement of cadastre system of Latvia, in the transition from public form of property to property owned by individual. Latvian specialists arrived at the conclusions, that many principles and practice of Swedish cadastre system is acceptable and suitable for the conditions in Latvia.

It was clear that considering the urgency of land reform and privatisation as well as limited amount of time, implementation of registration system could be based only on the use of computers, land registration system to be developed will have to maintain up-to-date a huge amount of rapidly changing data, for the present not being able to forecast all the possible types of data requests and data distribution.

Development of cadastre system of Latvia has been largely influenced also by the experience in development of computerised registration systems, as well as material and technical assistance generously provided by Denmark, Finland, Germany and other countries (G.Larson, 1991; P.F.Dale, 1995).

The processes of development taking place in the neighbouring countries – Lithuania and Estonia – were taken into account in setting up the registration system. It has to be pointed out that despite the many shared solutions in each of the Baltic countries a different system for registration of real properties was established having regard to the differing historical experience and adopted legal acts. The Lithuanian solution can be valued very positively since there unlike in Latvia and Estonia both cadastre information and the rights related to real properties are registered in a single register.

The end goal was defined as fully computerized register of real properties (cadastre) covering the whole territory of Latvia and cadastre map in a digital form closely linked with register data. It has to be stressed that it was planned to input a large amount of data on each land property.

During the initial period the descriptive part of cadastre and cartographic materials were compiled manually, by 'hand work'. However, soon it was clear that compiling the necessary cartographic and descriptive materials in a short period of time was possible only by automatizing this process, by introducing new

technologies and by transition from paper to computerized form. Taking into account the lack of computers, financial resources and trained specialists, this transition could take place only step by step.

The first, so-called Temporary Cadastre, maintained on central level since 1992, initially was maintained manually, it had simple data framework and was used for control of results of land reform. At the end of 1993 already 40 thousands real properties comprising 50 thousands of land parcels were registered in this register. As the technical equipment improved in the beginning of 1995 it was already possible to start a computerized maintenance of the Temporary Cadastre, keeping records on approximately 90 thousands of real properties comprising about 125 thousands of land parcels. In the end of 1992 in Latvia were established preconditions for function of real property market. Registration of real property rights for real property transactions was necessary, therefore former Land Register Law (adopted in 1937) was renewed and Land Register as independent register was implemented. On other hand State Land Service of Latvia was obligated to develop, implement and maintain national cadastral registration system (table 1).

Table 1

Development of national cadastral registration system

Year	Registration system	Data registration and processing	Level of maintenance
1991	Registration journal of land use	Manual	Regional
1992	Temporary Cadastre		Central
1993		Digital, Data Flex	Regional
1993	Cadastre Register		Regional
1998	National Real property information system	Digital, Oracle (28 data bases)	Regional
2003		Digital, Oracle (8 data bases)	Regional
since 2007		Digital, Oracle (1 data base)	Central

For the introduction of computerized registration system the necessity to develop the software of Cadastre Register became very important. It was developed initially in the Data Flex data base management system programming language, later – by using the software of ORACLE relation type database, which is based on SQL programming language. The new software was introduced for use in the beginning of 1998. The use of ORACLE software was of essential importance since it enabled maintenance of voluminous data bases, storing of large amount of data, protection against the damage of data, operative recovering of the defective segments in case of need, fast connection and integration of several data bases and storing of graphical data in the data base. The drawbacks of this software were the expensive licences for ORACLE and complicated maintenance - highly qualified specialists of data base programming, administration and service were required. Subsequently the software was continuously developed and improved, by introducing the changes prescribed in the legislation and by making it as convenient as possible for the users. By gradually improving the software storing of historical records and the link between textual part and Cadastral map was ensured (table 2).

Table 2

Development of content of Cadastral information system

Year	Textual part	Cadastral map
1992	Land properties, land parcels and encumbrances	X
1995	X	Cadastral areas and land parcels
1997	Incomplete extent of building inventory data	X
1998	Building properties	X
1999	X	Buildings
2000	Full extent of building inventory data, valuation of the land and buildings, apartment properties, leasehold, tax administration data and archive	X
2003	X	Encumbrances

The State Land Service has paid a lot of attention to completing the Cadastral map. Real preconditions for implementation of digital Cadastral map were established in 1994 when first orthophoto maps were produced. Due to lack of computers and trained staff transition period using manual technology was necessary. Manual Cadastral map for rural area was implemented in 1995, it covered whole territory of Latvia, was maintained in scale 1:10000, showed mutual location of land parcels and their cadastral designations (V.Parsova, 2005).

Digital Cadastral map was developed using software MicroStation, as basic issue were used documents produced by cadastral land surveyors, orthophoto maps, photomaps and other existent cartographic materials. In 1995 started accumulation of digital graphic data with simultaneous maintenance of manual Cadastral map, which maintenance was stopped in 1998 (table 3).

Table 3

Development of Cadastral map

Year	Registration system	Data registration and processing	Level of maintenance
1991	Land use projects	Manual	Regional
1992	Photomaps for rural area		
	Cadastral survey map for urban area	Digital, MicroStation	
1995	Cadastral map	Manual	
since 1997		Digital, MicroStation	Regional
since 2000	Central data storage	Digital, MicroStation	Central

At present Cadastral map covers the whole territory of Latvia, representing all land parcels. The Cadastral map that has been developed is very significant under the present market economy conditions and it is a widely used product for planning of economy, physical planning, designing and other purposes (Jansone A, Parsova V., 2010).

CONCLUSIONS

1. In the sphere of cadastre transition from the land cadastre during the soviet period to recognition of priority of cadastre legal and fiscal value and creation of real property market has taken place.
2. By applying the former experience of Latvia in the maintenance of cadastre and the experience from other countries, a computerized real property registration

system that is based on legal acts consisting of textual data and Cadastre map has been developed in Latvia.
3. Cadastre data of the National cadastre information system are maintained up-to-date, by continuously updating them according to cadastral surveying documents and data of other state information systems.

BIBLIOGRAPHY

1. Cadastral Surveys and Records of Rights in Land, revised by Peter F, Dale, Food and Agriculture Organization of the United Nations, Rome, 1995, 88 pp
2. Eglītis, M., Kanaviņš, H. Valsts kadastra sistēmas izveidošana un uzturēšana Latvijā. LLU Raksti Nr.17, Jelgava, 1998, 215. - 223.lpp.
3. Ericsson, A. The Swedish Cadastral System, a different but efficient system. FIG Commission 7 – Cadastre and Land Management, Gaevle, 2001, 4 pp.
4. Larson G. Land registration and cadastral systems. New York, 1991, 175 pp.
5. Nekustamā īpašuma kadastrs Latvijā 1940 – 2004. Valsts zemes dienests, Rīga, 2004, 239lpp.
6. Parsova, V. Cadastral identification system in Latvia. Journal "Agrarian Sciences" of the State Agrarian University of Moldova, Vol.1, 2005, Chisinau, 2005, 52-55 pp.
7. Jansone A, Parsova V. Evaluation of Vector Data Quality of Cadastral Map in Latvia. Proceedings of the international scientific methodical conference „Baltic Surveying – 2010", Kaunas, 2010, 66 – 72 pp.

Date of presentation: 03.08.2011.

УДК 332.3:631.15

СХЕМА ЗЕМЛЕУСТРОЙСТВА АДМИНИСТРАТИВНОГО РАЙОНА В СТРУКТУРЕ ТЕРРИТОРИАЛЬНОГО ПЛАНИРОВАНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ

Д. ЧИЖ

ГНУ «Научно-исследовательский экономический институт Министерства экономики Республики Беларусь», Беларусь

Abstract. There's given characteristics of territorial planning of the Republic of Belarus in the article. Much attention was paid to land management documentation which is the scheme of land management of district regions. The structure of the scheme of land management of district regions was discovered, there were given methodological recommendations on how to solve land management problems such as placing the objects of social and engineering infrastructure as well as the elements of ecological network.

Key words: Administrative area, Ecology, Ground area, Land management, Territorial planning.

ВВЕДЕНИЕ

В современных условиях территориальное планирование становится одним из инструментов устойчивого социально-экономического развития Республики Беларусь, объединяя в единое целое социальную, экономическую и экологическую политики, интегрируя отдельные отраслевые усилия на