EVOLUTION OF CADASTRE AND CADASTRAL MAPPING IN ALBANIA

Pal NIKOLLI[1], Bashkim IDRIZI[2], Ismail KABASHI[3], Murat MEHA[4],

ABSTRACT

In Albania, the System of Immovable Property Registration, which realizes the registration of property titles, has been created. This system, based on parcel (property not only register of the mortgage office), includes all properties in the private and public sectors and unifies the Office of Cadastre and Mortgage Office in an institution.

This system is chosen, because this type of registration system protects property rights, hence granting the owners the ownership certificates and certificates of real rights, since it is simple and low-cost, it is open, i.e. provides public information on any property (this information is needed to purchase real estate sales, etc..) and allows the construction and use of GIS (Geographic information Systems).

The production of cadastral maps (1946 – 1991) is effected by using the classical methods (tachymetry) at a scale of 1:2500 and 1:5000. The maps are used not only for cadastral purposes, but also for different considerations, such as land irrigation systems, land management, and so on.

Today, the strategy developed to produce cadastral maps for the entire country uses all data sources. This strategy has two main components: combining all the existing maps resources, and updating all the existing maps.

The introduction of new technology has begun with the training of personnel and the purchasing of new equipment in order to extend mapping capacity. The new technology also includes use of the Global Positioning System (GPS) for surveying the control and detail points. A combination of all methods and technologies is used in order to achieve the best results.

This paper addresses the development of cadastral systems and the registration of real estate in Albania. Also, it analyzes the stages of cadastral mapping and cadastral maps features created for the administration of property.

Key Words: cadastre, cadastral map, cadastral mapping, land administration, System of Immovable Property Registration**.**

[1] **Dr. Pal NIKOLLI, e**-mail: palnikolli@yahoo.com
Tirana University, Faculty of History and Philology, Tirana, Albania. www.fhf.edu.al
[2] **Dr. Bashkim IDRIZI,** e-mail: bashkim.idrizi@unite.edu.mk
State university of Tetova, Faculty of Natural Sciences and Mathematics, www.unite.edu.mk
[3] **Dr. Ismail KABASHI,** e-mail: ikabashi@gmx.net
University of Prishtina, www.uni-pr.edu; Prishtina, Kosova
[4] **Dr. Murat MEHA,** e-mail: mmeha2012@gmail.com
University of Prishtina, www.uni-pr.edu; mmeha@yahoo.com Prishtina, Kosova

INTRODUCTION

Land is an important resource for the sustainable development of economy. Cadastre and Land Registration are two main factors of Land Administration Systems (LAS). The registration system of real estate in Albania has gone through a series of stages to reach its present form. In the past, property registration has been patchy and with a pattern completely different from today's concept of real estate registration. The Institutions that have operated estate information were the mortgage office and the Cadastre; the first institution operated information about parcels of land, while mortgage offices only serve urban areas, and where the focus was the owner of the property, even property transactions was not necessary to pass through her. In the early 90's there were undertaken a series of reforms in the land market. These reforms consequently led to fragmentation and reorganization of the boundaries of land parcels and thus the creation of over 3 million private estates. Transfer of rights from state to privatized created at the time over 500 thousand private owners. In this situation it was necessary to begin work towards building a new system of registration of real estate. In view of this goal the Coordination Working Group was established, the Action Plan was approved and the Project Management Unit (PMU) / System of Immovable Property Registration (IPRS) and then the Office of Registration of Immovable Property were established. Principles, on which IPRS lies, are: parcels, cadastral and mortgage office integration, i.e. the right of property and mapping. IPRS includes all assets, both private and state in all areas both in rural and urban areas. The public continues to confuse the Registry of Immovable Property with Mortgage Office, but the truth is there are two entirely different concepts, since the new system is in the center and not the property owner and the property consists of several components, such as the legal act of profit ownership, indicative maps and property cards containing all the information on the property. Since the first registration of property had not been a priority due to lack of land market, it was seen as an obligation of immediate registration of property in order to adapt them to the new registration system. Albania is divided into approximately 3055 cadastral areas and in many of them the initial registration has not yet passed. During these years of initial real estate registration there have noticed a number of problems such as: lack of initial registration in many areas, lack of training and guidance to staff of the Office of Registration of Immovable Property (IPRO), service delivery time inappropriate, increased workload due to the increasing number of property records, neglect massively updating digital information in cadastral areas where initial registration has been completed, damage of maps etc. To eliminate these problems a number of measures dealing with legislative changes have been taken, the establishment of monitoring system in service delivery, strict control of the local offices of real estate assets in districts, staff training, etc.

The vision of the Central Office of Immovable Property Registration (COIPR) has to do with the fact that citizens and institutions to benefit the social and economic opportunities generated by an efficient and effective registration system of registration of real estate where: cards include records understandable and correct the ownership of land and other Immovable property and rights thereon; all

information of cards and maps is ready and available to the public, registration of land and property transactions is immediate; use of progressive electronic means to improve efficiency and time of the service is constantly improving.

From 1945 until 1996, the work about cadastral mapping is made by the Department of Topography of Soil Research Institute in Tirana. This period can be divided into four main phases: the first phase includes the work done during the years 1946-1960; the second phase includes the work done during the years 1961-1991, the third phase includes the work done during the years 1991-1996 and the fourth phase includes the work done during the post-1996 period.

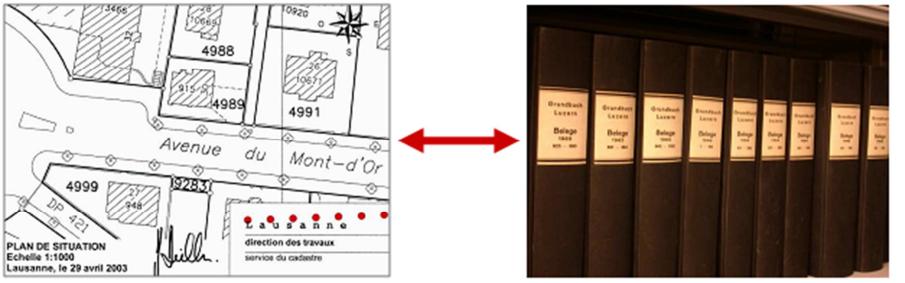
After 1996, IPRS has defined two major tasks: first, the emergency needs for land registration in the country to realize new maps zooming in scale of 1:2500 from 1:5000 scale maps by photomechanical methods and by means of relevance field; second, new cadastral maps compiled on the basis of photogrammetrical relevance. In both these areas, work has begun and continues apace.

2. CADASTRE, CADASTRAL MAP AND CADASTRAL MAPPING

According to a Law Dictionary, adapted to the Constitution and Laws of the United States, by John Bouvier and published in 1856, Cadastre is a term derived from French, which has been adopted in Louisiana, and which signifies the official statement of the quantity and value of real property in any district, made for the purpose of justly apportioning the taxes payable on such property. Meanwhile, according to The American Heritage® Dictionary of the English Language, Fourth Edition copyright ©2000 by Houghton Mifflin Company, updated in 2009 and published by Houghton Mifflin Company, ca·das·tre also ca·das·ter (kə-dăs'tər) is "Apublic record, survey, or map of the value, extent, and ownership of land as a basis of taxation".

The FIG statement on the cadastre defines the cadastre as follows: A Cadastre is normally a parcel based, and up-to-date land information system containing a record of interests in land (e.g. rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of the interests, the ownership or control of those interests, and often the value of the parcel and its improvements. It may be established for fiscal purposes (e.g. valuation and equitable taxation), legal purposes (convincing), to assist in the management of land and land use (e.g. for planning and other administrative purposes), and enables sustainable development and environmental protection (FIG 1998).

The cadastre consists of two parts – the registers and the maps (fig. 1).



a) b)

Fig. 1. Cadastral map based on: a) Cadastral surveying; b) Land register (Steudler, D., 2007)

The foundation block of a cadastre is the cadastral plan (or survey plan). Cadastral maps are produced by joining together individual cadastral plans. These maps are used by a broad range of people (public and professional) for all manner of things including real estate sales, valuation, Land Title Office management of the cadastre, planning etc.

Cadastral Map is "A map which shows the boundaries of subdivision of land, usually with the distances, bearings and the areas of individual tracts, for purposes of describing and recording ownership" (Dictionary & Translations). Cadastral maps contain a unique parcel identifier to establish the link to the land-ownership information. When maintained in a real-time manner, cadastral maps can serve as the base for a reliable property rights system.

Cadastral mapping is one of the best known forms of mapping, because it is the mapping that shows all of the land parcels in relation to one another and to the adjoining roads (Meha, M., 2008). It is also one of the most ancient forms of mapping – for example ancient Egyptians are known to have developed cadastral records so that land ownership could be re-established after the annual flooding of the Nile River.

2.1. The cadastral system in Albania

The area of the Albania comprises 28,748 kilometers^2, of which 7,000 kilometers^2 are agricultural, 10,400 kilometers^2 are forested, 4000 kilometers^2 are pasture, 500 kilometers^2 are urbanized, and the remaining sectors are lakes, rivers, roads, seaside beaches, rocky expanses, and the like (Jazoj, etc., 1997).

Proper cadastral system, implemented in Albania has its roots in the time of Turkish occupation. The history of its development can be divided into five periods (Nikolli, P., 1998):

2.1.1. The period of Turkish rule

In this period the cadastre had completely the features of Turkish Cadastre. The Cadastral Surveys (1431 to 1912) were a land taxation record, census-like in research usage. The Ottoman Turks conducted extensive surveys of land and population dating from as early as the 1400s. The resulting records are of two types, detailed and abridged. The period of Turkish rule was in force until 1928, when Albanian Kingdom was formed. The character of cadastre and registration system was dependent on the type of tax. Data on soil properties and real estate given in the form of records which were marked: name of owner, property type, quantity and quality of soil, and a toponym which, in addition, created a rough idea about the location of the property in accordance with the designations set by the residents. In these records the transactions or forms of transfer of property from one owner to another at different times were given. This type of cadastre was indexed by neighborhoods of villages or towns of a caza.
By the mid-nineteenth century, in cities and rural areas near them, the owners began to obtain land patent according to their requirements. It should be noted that this type of cadastre operated in almost all regions of Albania, except in regions that have some autonomy from the Turkish government (e.g. Mirdita Mbishkodra etc.), where property relations and guarantee is regulated by local laws, as canonical rules of Alexander, canonical rules of Scanderbeg etc.

2.1.2. Period of the Kingdom till World War II (1928-1944)

The establishment of the Kingdom of Albania marked the birth of Albanian laws on land ownership and real estate. The efforts to achieve a land cadastre and property registration system according to Euro-Western models, namely the Austrian model, began. It should be noted that the perception of law and form of organization in the Albanian system, marked a step forward compared to the Turkish system. During this period there was formed and began operating as a form of mortgage offices higher property maintenance and insurance. During this period there began land transactions with foreigners, which were almost absent in the previous period. In certain areas (major cities and important areas of lowland part of the country) there began mapping, which brought about an improvement and enrichment of the system regarding the location of properties and mutual constraints between the owners. Besides the tax there began outlining the purpose and other purposes related to property transactions.

2.1.3. The period after World War II until 1967

As a conceptually different period of political and social compared with the previous two periods, the period after World War II until 1967, reflected its specific targets even in the ownership of the cadastral system. It started shakenly to move towards eradicating the concept of sanctity of private property. Thus, in 1946, the agrarian reform expropriations followed by partial or complete a class of owners and the expropriation of a broader category of other owners began.
To realize these transactions an entirely new nature created a new legal basis. These legal changes required need of perception and performance of another system cadastre and registration. It should be noted that characteristic of the cadastre at this stage was the fact that: direct measurements of parcels of land and creating drawings with geometric dimensions and restrictive neighboring parcel owner served to establish the property served. Hence, cadastre began to be more representational with graphic material. The scope of this cadastre was already completely local, finely detailed and all items of land and property. A fundamental flaw with the social consequences was that the conflict still lost the original owner of the land distributed in the name of reform, which was given to new owners. In the lowlands of the country there was launched the creation of cadastral maps in large scale, which served for a long time and still retain dimensional plots value and legal values positioning especially after 1990, which served many processes in the reform of property.

2.1.4. Period 1967-1990

In this period, the cadastre and property registration system changed as to the purpose and for the structure. Total expropriation of the individual and society reduced to nothing functioning cadastre and mortgage offices in cities. Despite that, there existed in every district cadastre and cadastral survey proceeded, land lost quality of a public office. It was plain evidence of moving office land owner only for the purposes of "state".

2.1.5. Period after 1990: The system of registration of real estate in Albania

Registration system of real estate In Albania has gone through a series of stages to reach its present form. In the past, property registration has been patchy and with a pattern completely different from today's concept of real

estate registration. The Institutions that have operated estate information were the mortgage office and the Cadastre; the first institution operated information about parcels of land, while mortgage offices only serve urban areas, and where the focus was the owner of the property, even property transactions was not necessary to pass through her.

In Albania there is formed the real estate Registration System in the most useful way. This system uses computer technology and assists substantially the study of economic and social feasibility. Land reform in Albania has progressed very rapidly, currently over 90 percent of agricultural land is distributed to the farmers and there have been created about 1.8 million new parcels registered with cadastral areas. In urban areas, housing privatization has been completed, and there is being created some 300,000 new properties in cities, which are recorded in the mortgage office. Currently the property market has been formed and has started and its transactions are progressing. Conflicts exist, especially in urban areas, between former land owners and developers of new buildings on these properties. Therefore, the system of registration of real estate in Albania is still on the way to perfection.

The system of registration of real estate in Albania is based on these principles: The principle of "Mirror" (i.e. that information on real estate must reflect current realities); The principle of "Curtains" (i.e., index cards, and maps must be information about ownership and other real rights, without requiring further verifications); The principle of "guarantee" (i.e. that the state guarantees that any information is correct and cards for any damages that may be caused to anyone due to information wrong by IPRS, will be compensated); principle "open" (i.e. anyone can get information about any property that is interested).

The system consists of Central Office of Immovable Property Registration, Registration Area (which is under the respective authority of a registration office in the district) Cadastral Zone Property which is assigned to an index map and supplemented one property card. Registration of real estate is made to the card and the map index (Meha, M. 2008).

IPRS has developed its strategy consisting of:

- Determining the law of a modern system of real estate information, based on real (not merely record the acts) that unifies the registration and "cadastral mapping", which includes all real estate in a common registration system, in which the state provides registration information and where the registration offices are decentralized.
- Maximum correction of technical errors made by the legal fees in the case of privatization, through mapping and field verification of documents of privatization.

- Establishing validity and obedience local property rights and made public through display of maps and property ownership information derived from field update.
- Informing the general public about the IPRS and procedures through training and media transactions.

The primary agency of land administration is the Immovable Property Registration Local Office (IPRLO). The IPRLO is the successor agency to the original Immovable Property Registration System (IPRS), which initiated systematic land title registration in the 1990's. The Immovableangible Property Registration Central Office (IPRCO), which is under the Ministry of Justice, is responsible for land titling and registration, maintenance of records and oversight of surveying and mapping. The IPRCO operates from a central office in Tirana and in 12 prefectures (counties). At the commune level, local administrations are responsible for land appraisal, tax administration, and land use monitoring (Çomo, B., 2012).

2.2. Cadastral Map and Cadastral Mapping in Albania

Work done by the Department of Topography of Soil Research Institute in Tirana, extends to the period 1945-1996, a period which is divided into four main phases: 1946-1960; 1961-1991; 1991-1996; 1996 and onwards (Shehu, A., Nikolli. P., 2001).

New topo-geodetic and cartographic works were made in the first phase in Western Lowland spaces, in the areas of Korça and Devoll, etc., in areas of Delvina, Saranda etc. In the second stage, works were mainly in the hilly areas of the country, and in some flat areas, not observed during the first phase. In the third phase there were made intense surveying in some hilly areas and there were made updating of new cadastral maps, which were necessary for the registration of real estate. For this purpose, classical and modern methods such as areophotogrametric survey and digitized works are used (Shehu, A., Nikolli. P., 2001).

Maps prepared by the Department of Topography, in all three phases, are used for cadastral purposes and various engineering works, as in the design of new human settlements, in the design of communication networks, irrigation and drainage systems, etc. Maps prepared during the first phase, currently even have an historical significance: they are used for the identification and registration of real estate inherited from the past. Maps of the first phase and the second phase can also serve for various scientific purposes as accurately recognizing the environment and its changes in time and space, as well as prognosis studies to preserve and protect it from degradation and abuse, etc. Maps prepared during the third phase are numerous and include more surveying surfaces those of the first two phases.

New digitized cadastral maps have current value because they serve as the basis to reflect the marketing of land in the future, etc.

In the cadastral maps of the three phases there are not shown:

- Layout of the main cities, because it was the duty of Geodesic-Geological service of the Ministry of Construction, realized by it in 1:500 scale;
- The areas covered by military zones;
- Areas where buildings are objects of a confidential character, etc..

2.2.1. Cadastral maps of the first phase

Cadastral maps of the first phase are created during the years 1946-1960, and are distinguished from maps of later phases, both in content and form. These maps are created in 1:2500 and 1:5000 scales. The latter are few and are the result of decreased 1:2500 maps with the mechanical method. Field surveying was conducted with a tachometer (Shehu, A., Nikolli. P., 2001).

For creating maps in 1:2500 scales, it was first built on the necessary geodetic network, which was based on the existing network of Italian triangulation. But triangulation network of Italy built during the period 1920-1930 and was destined to meet the accuracy of maps to 1:25000 scales. However, careful work of Albanian engineers and technicians in frequency and processing of new geodetic network, made possible for the geometric accuracy of the contents of large scale maps (1:2500 and 1:5000) to meet the time requirements. To create maps of the first phase, there was determined the mathematical basis: Ellipsoid of Bessel, Gauss-Kruger Projection, Lo (central meridian) = 20°00 ', geographical network missing in maps,

- Mile network is given every 10 cm on the scale of the map (250 m to scale of 1:2500 and 500 m to 1:5000 scale), the size of work trapeze are relatively large: 90 x 60 cm, including an area of 3.375 km^2 (to scale 1:2500) and 13.5 km^2 (to scale 1:5000)
- Orthogonal coordinate system based on the geographic equator and the meridian passing through the center of the country, Lo = 20 ° 00 '; on this meridian, the Y-axis values have different signs (±).

Outside the borders of maps, there are shown:

- Name of the prefectures, or sub-prefectures,
- Name of the village cadastral relevance;
- Designation of base map and neighboring areas;
- Relevance year, drafting and drawing;
- Surveyors names, designers and renderer.

Within the maps, there are shown:

- Geodetic triangulation point and name of facility location.
- Relief shown by contour lines, light brown, cutting of which varies depending on the surveying terrain. In lowland areas logging relief varies

from 0.25 m to 0.5 m or 1.0 m. In some mountain foot slopes of hills contour lines built every 5 m height. Quotes of the points of heights and surveying detail points are numerous, in places up to 4 quotes in 1 cm^2 area of the map. The relief of the sea and swampy areas is indicated by depth lines, blue, cutting of which is usually 0:25 m or 0.5 m. Relief of mine is indicated by special signs.

• Human settlements and industrial centers are shown in minute details; there are well-presented even separate buildings and rubble. Their names are old ones.

• Hydrographs are shown quite detailed: the sea, lakes, rivers and streams associated with their names. Irrigation and drainage canals, water sources and wells are detailed.

• Forests are framed with symbolic signs, indicating their type, or simply writing some "forest" and no other elements within their area. Sometimes the area occupied by pastures is treated in the same way. Orchards are shown in details.

• Traffic Network is also shown complete, with all categories of roads, pedestrian routes to and connecting human settlements, or other important objects and isolated. Detailed display of high voltage lines of low electrical substations and booths, etc.

• cadastral boundaries of the villages are shown with a green line of thickness 1.5 mm. Presented detailed boundaries of land parcels with respective numbers of owners and in some maps there are noted the names of owners of plots and houses.

• swampy areas showing signs of traditional mapping with blue color, contoured surface which is the same color, and within wetlands, there are shown signs of vegetation type on them, black. Water depths are shown; likewise depth lines swamps, or depth quotes and blue.

• Names of the urban, hydrographic elements and other objects, are all beautifully shown and clearly written.

In conclusion, we can say that the maps of the first phase, despite being prepared in the form of original publication, are equally old and contemporary (Shehu, A., Nikolli. P., 2001).

2.2.2. Cadastral maps of the second phase

Cadastral maps of the second phase were created during the years 1961-1991, with a large volume of surveying work and drafting. They are in the 1:2000 scale (1228 maps) and 1:5000 scale (2665 maps) (Shehu, A., Nikolli. P., 2001).

The main features of this phase are:

1. new elements were used to map content;

2. there began surveying the hilly areas and later the survey was extended in the lowlands of without surveying in the first phase, or surveying ago, but with significant changes in content.

Elements of mathematical basis for maps of the second phase are:

- Ellipsoid of Krasowski,
- Projection of the Gauss-Kruger,
- Lo central meridian = 21 ° 00 ',
- Change of the designations of maps, their formulation and size: from 90 x 60 cm to 44cmx 37 cm.

As a result of changing the mathematical base, all maps of the first phase were transformed from Bessel ellipsoid to Krasowski ellipsoid. Even maps of second and third phases were transformed into Krasowski system. Topographic survey of the second phase was supported on existing triangulation network dandifying it. Also in the second phase there are used tachometric Surveying methods.

Content of the maps is quite rich and detailed with geographical elements. In these maps there are noticed new items, such as human settlements, roads and power lines, reservoirs (catchment) and irrigation and drainage systems, etc. Relief shown by contour lines every 0:25 m and 0.50 m (in lowland areas) and every 1 m in hilly areas (only to 1:5000 scale). Depth lines are given every 0.5 m (Shehu, A., Nikolli. P., 2001). About 30% of maps in 1:5000 scale created in 1960, were re-made in the 1970s and 1980s due to significant changes in many lowland areas. Maps in 1:2000 scales (about 1228) were created during 1970 and 1980 and were characterized by a highly detailed content. Most of these maps are located in the meridian of longitude 20 ° 00 'or in its vicinity.

2.2.3. Cadastral maps of the third phase

Registration of immovable property privatized in the village and town, urged the creation of a unified system based on the parcel. For this purpose the relevant documentation of verbal and graphic registration of the cadastre of rural and urban areas were gathered. Also the materials from the forest cadastre and by mortgage offices were gathered. Graphic documentation includes the series of scales 1:500 to 1:50000. Cadastral maps, which show the position and size of each parcel and their owners, serve as the basis of this system. Urban plans in scale 1:500 have been reduced in 1:2000 scales with dimensions 90 x 60 cm. It was decided to create new maps for the rural areas (Shehu, A., Nikolli. P., 2001).

2.2.4. Cadastral maps of the fourth phase

The Immovable Property Registration Central Office (IPRCO) has elaborated a strategy for the creation of cadastral maps for the entire territory. It was decided to create new maps by using Geographic Information Systems. For this purpose there are used not only existing cartographic materials and surveying, but aerial photographs acquired in recent years, as well as satellite images.

3. CONCLUSIONS

The system of registration of real estate in Albania has passed through several stages to reach its current form. In the past, registering property has been partial and based on a completely different model from the current model. Institutions that have operated with real estate information (until 1994 year) have been Mortgage Offices and Cadastre.

Cadastral maps prepared, served not only for cadastral purposes, but also for various engineering works, as in the development of new human settlements, road design and other engineering works etc.

Currently, the Registry of Real Estate manages a combination of basic information on paper and digital information. System of Immovable Property Registration in Albania consists of Central Office of Immovable Property Registration and Registration of Local Offices in each region. Registration system in Albania real estate based on these principles: the principle of "Mirror" (i.e. that information on real estate must reflect current realities); the principle of "Curtains" (i.e., index cards and maps should be information about ownership and other real rights, without requiring further verifications); the Principle of "guarantee" (i.e. that the state guarantees that any information is correct and damages that may be caused to anyone due to wrong information by IPRS will be compensated); principle "open" (i.e. someone can get information about any property that is interested) (Çomo, B., 2012).

Albania is in the process of transition from analog cartography to digital cartography. For this purpose are carried out a series processes dealing with the scanning of existing mapping and production of new vector maps based on orthophotography.

Today, cadastral maps are used by the Registry of Real Estate to manage the process of privatization of real estate or property restitution and compensation in accordance with the Albanian legislation.

The technology available is no different from what is available in Western Europe. This is more a matter of choice or technical optimization than availability. In any case, the technical solutions in cadastral mapping in Albania are very similar to Western countries.

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