

ASPECTS REGARDING THE STUDY OF THE REAL ESTATE DYNAMICS IN A LOCALITY

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Abstract: *We propose solutions to current problems undeniable, optimum use of all available information within the local government. In addition, it is envisaged analyzing the evolution and dynamism characteristic of the cadastre, the owners and properties of rural areas. Main objective of the study is to achieve a Cadastral Information System, to ensure complete processing of all available information in the administration of a territory and its implementation within local government.*

Key words: *evolution, cadastre, dynamism, properties, local government.*

1. Introduction

The project aims to contribute by the study and the research, to achieve a Cadastral Information System, that will contribute to the development and implementation of a database in the local government unit. To achieve the objectives was covered, in a first step, theoretical documentation specialized, combined with research conducted until now, internationally and nationally. Within the project proposed, was passed, in the second stage, to achieve a graphical and textual database, to the territorial unit Orzeni village, commune Holboca, Iasi County. Based on legislation in Romania and proper use of equipment and measurement methods, was performed topo-cadastral identification, delineation, measurement, updating and recording of real estate cadastral documents.

Creation and development of Cadastral Information Systems in a unified framework and in each administrative unit, provide both local data integration at the national level and the international community generally. In terms of operation and query the database from the structure of the Cadastral Information System, can appreciate that this relational database meet the specific requirements of the beneficiaries and users.

Achieving such a system in a unitary concept in each administrative area, allows the integration of all national data, facilitating the work of producing summary reports regarding the status and evolution of land on the territory and category of use, the structure of property titles, the economic value of land and buildings, so necessary in the transition stage.

Dynamics of changes to the properties dimensions, surface, use categories and owners during the 20 years of the Revolution of 1989, mainly due to the application of Law no. 18/1991, for the restoration of property rights, dismemberment approved by County Offices of Cadastre and Real Estate-OCPI and conditions imposed by Law no. 50/1991 on the authorization of construction works.

To achieve the overall objective of the project, took into account both the legal regulations, highlighting the main laws that underpin the tracking system of the properties, and technical standards in compliance with cadastre domain. In this context, the project presented in three distinct phases:

- *documentation and procurement of cadastral informations;*
- *execution of topo-cadastral measurements of land;*

- data processing and preparation of the experimental model.

The importance of the project was highlighted first by the major objective led to the creation of a relational database to ensure information needs of the local community in the legal and proper management of the properties. Among the specific objectives of the project achieved, most important are those concerning the methods used to **create graphic and textual database** and, respectively, **the dynamics of the properties in a locality** regarding the technical evidence, economic, and legal.

2. Realisation stages of the project to study of the real estate dynamics

Realisation of the project included the completion of the study conducted over a total of **nine distinct phases** (Table 1), which were used appropriate methods and precision and efficiency, differentiated logistics software for the collection, storage and processing.

Table 1 - Stages achieve Cadastral Information System

| No. Crt. | Stages of work | Specific operations |
|----------|---|---|
| 0 | 1 | 2 |
| 1 | Study of the topo-cadastral base existing for the area of the study | The accumulation of all materials and information necessary to conduct the study |
| 2 | Framing mapping of the study area | Analysis of the situation in terms of geodetic and cartographic database existing, of work performed, the information required to be collected, etc.. |
| 3 | Realisation of the geodetic network | Determining of solutions in relation to the situation analysis and technical standards work and financial resources. Objectives: 1. Designing support network. 2. Measurements for the networking support. 3. Processing of GPS measurements. |
| 4 | Realisation of the topographic network | Objectives: 1. Network designing. 2. Measurements realisation to achieve lifting network. 3. Lifting of the details necessary to achieve digital cadastral plan. 4. Points calculation of the lifting network: |
| 5 | Textual data collection. Identify the land owners and land use categories. | a) existing data in 1989; b) existing data in 2005; c) existing data in 2012; d) recording in the standardized files. |
| 6 | Realisation of the digital cadastral plan | With AutoCAD Map. |
| 7 | Loading data files and database organization | With Microsoft Access software |

| | | |
|---|---|--|
| 8 | Realisation of the Cadastral Information System | With Open Source software: Quantum GIS. |
| 9 | Analysis of results | Making reports, statistical tables, graphs, thematic maps. |

1. Study of the existing topo-cadastral database for the area of the study was based on existing cartographic materials, which were developed in **1989**, and in **2005** and completed in **2012**, through cadastral measurements "*interview sheets*."

- **Graphical database** included the following sources: the cadastral plan at 1:2000 scale, edition 1989; orthophotomap, scale 1:5000, edition 2005; digital cadastral plan, elaborated in 2012, through the topographic measurements performed with GPS technology and modern total station.

- **Textual database** was extracted from the following documents: agricultural register 1989, 2005, 2012; property titles, owners register and parcel (1989) ownership documents, site plans and cadastral delimitation; sheets interview (2012).

2. Framing cartographic study area was highlighted by the inventory of trapezoids geodesic comprising village Orzeni, being mentioned: two trapezoids scale 1:5000 and 1:2000 scale, three trapezoids.

3. Achieving geodetic network support consisted of measurements with GPS technology to determine to four points us in Stereographic 1970 Coordinate System. The field observations were made with **dual-frequency GNSS receiver, South S82T**, by the static method, which provides high accuracy, and by the real-time kinematic method (RTK). Based on measurements made by the two methods presented: sheet observations, processing observations, geographical coordinates and the coordinates of the Stereographic 1970, obtained by the static and RTK method. The analysis results indicated superiority to RTK measurements in terms of measurement accuracy and time to perform the measurements, which is short compared to the static method.

4. Realisation of the topographic network included detailed topographic measurements necessary for drawing digital cadastral plan. For this purpose, was used the method traverse planimetric support, combined with the removal. The field observations were processed using TopoSys that has come full range of processing steps, from compensation to export data and graphics in. DXF or. WMF.

5. Textual data collection was undertaken on the basis of three categories of existing cadastral documentation: in 1989 (Phase I), 2005 (Phase II), and 2012 (Phase III). In case of updating cadastral data for the year 2012 was used "*interview sheet*" where it was recorded: full name owner address, category of use of the parcel and the legal status of the properties.

6. Realization digital cadastral plan with the AutoCAD Map was prepared by the following processes: import and vectorize existing cadastral plan (edition 1989) and orthophotomap (2005 edition), measurements processing and reporting detail points (edition 2012).

Existing plans scanned were inserted into AutoCAD Map, where was proceeded to measure the dimensions of the geodetic trapezoids, scale 1:5000, which were compared with those calculated analytically from the corners coordinates. The errors obtained were within the limits of precision of drawing graphs of the plan at 1:5000 scale. Further study described the process for georeferencing scanned plans, reporting from the four corners of the trapezium and to create topology.

7. Cadastral Information System project realisation using Microsoft Access was finalized taking into account the link between the cadastral records and legal records of the properties.

8. Cadastral Information System project, using Quantum GIS software was based on using the same graphical and textual database mentioned above, using the sequences of 1989, 2005 and 2012. Quantum GIS software offers a number of advantages listed by saving time, stages of implementation, costs and usage.

In the case study were mentioned *four stages of realization of Cadastral Information System (SIC)*.

- Defining and attaching the Stereographic 1970 Coordinate System is made before the process of georeferencing a raster image that is brought on its spatial position automatically.

- Define workspace by saving it in a project file that contains all the information saved.

- Loading graphic data was performed for all raster images for three digital cadastral made in AutoCAD Map, which were inserted in the QGIS. Similarly to the case for loading textual data that have been imported from Microsoft Access, file with the extension. dbf in the format supported by QGIS.

- Exploitation and database query was exemplified by obtaining the main graphical reports, textual and mixed, used for local government, respectively, and thematic and cadastral plans at different scales. It was also mentioned the possibility of questioning on obtaining information about the owners, parcels and/or buildings.

9. Analysis results on the dynamics of the properties in the village Orzeni, commune Holboca, Iasi County was based on technical, economic and legal, existing in 1989, 2005 and updated in 2012.

Optained results were analyzed on the basis of the main entities (properties and owners), both in terms of evolution over time and the management mode of the database in local government and in other activities.

Statistical reports prepared based on existing textual cadastral registers corresponding to the three stages studied, allowed assessing the dynamics of properties and owners, in accordance with the evolution of ownership.

Querying of structured database on the two components, spatial and textual provides obtaining required statistical reports and those graphics. Comparative study on the dynamics of the properties was noticed by a number of technical and legal issues, the most representative being mentioned.

a. Discordance between areas of the parcels included in the cadastral records and digitized ones in 1989 and 2005.

b. Evolution of the parcels without property documents in 2005.

c. Analysis of property titles revealed numerous irregularities, being noted the ones referring to the mode of redacting, inscribed surface and the inconsistency between owner register and property title issued.

d. From other queries SIC facility was exemplified those related to obtaining information about parcels, as follows:

- Select parcels with the same owner, in 2005;
- Select parcels with cadastral number, in 2012;
- Select parcels with an area greater than 500 m² in 2012;
- Selecting all information about a parcel.

e. Parcel's legal situation analysis was presented by the following categories of queries experimental model:

- Inquiry on changing owners in three stages.
- Automatic selection of the owners of the three stages.
- Selection parcels legal amendment in 2005 and 2012.
- Selection of cadastral parcels sold, in 2005, due to changes in the legal situation.

Queries results, in the territory of the village Orzeni, commune Holboca, with a **total area of 76.14 ha** in 2012 was synthesized, based on technical data support cadastral records and the following thematic maps. Among them we can mention următoarele:

- Utilisation mode of lands on categories.
- Distribution of surface class cadastral parcels.
- Distribution of buildings by type of use.
- Evidence of construction according to their height.

Statistical analysis of the contents of the databases and comparison of three phases included in the study according to the following graphic and textual representations of the data (chart).

- Evolution of the total surface area of the village Orzeni.
- Evolution of the use of yards and buildings.
- Evolution of the number of parcels by category of use.
- The evolution of surfaces by category of use.
- Dynamics of land value tax.
- The structure of the legal situation of parcels.
- Number evolution of constructions.
- Evolution of the number of parcels for housing.
- The evolution of materials used in the construction execution.

The final part of this study have been reported several requirements necessary for specific activities of the local government on how the inventory and management of various types of construction. Also, it was noted the role of the database of properties in a territorial unit. In this context, the following were mentioned: the legal movement of properties, securing tenure, cadastral record system optimization and other.

3. Conclusion

The importance and topicality of this work consists in the fact that only through cadastre can be analysed at any time the availability of resources, their status over time, how they are used in compliance with the requirements and conditions imposed by sustainable development.

To achieve this Cadastral Informational System we need a digitalised cadastral plan and digital cadastral specific data. **The advantages of digital use are incomparable.** The most important are:

- the stored data for the digital plan are positive and can be easily preserved; they can be displayed whenever we want on any scale;
- the plans made this way allow a complete decision to solve any problem for any type of work (for studies, projection, application);
- cadastral files can be easily used, being capable to respond to all interrogations in a very short time.

To be able to use this cadastral digital data within the Cadaster Informational System, they must be integrated in a database. This database will allow the Cadaster Informational System to solve a series of problems in the current cadaster and real estate advertising activity.

Regarding the dynamics of the properties in the study area:

- changes in the study area occurred as a consequence of property laws, dismantling land, build houses, and the village area Orzeni increase by introducing land in the village limits, on the Urban Master Plan developed in 2010;
- realisation of a Cadastral Information System for local administration, has a positive impact because it can determine at any time the history of a property or of a construction;
- analysis of the dynamics of rural areas, in terms of the properties and owners represents an effective study for all departments of the local government.

Therefore, building a **database of properties from an administrative territory** is a very complex project that will contribute to improving the following aspects:

- facilitating the legal movement of properties on the property market and guaranteeing property rights of citizens;
- Stimulation economic development and social logistics by improving the evidence system of properties and operational speed;

Realisation of the proposed project contributes to the development of a field situated at the edge of scientific and technical knowledge, between priority areas nationally and internationally.

With the rapid development of the information technologies and the up-to-date methods of measurement, it became necessary to upgrade the services delivered to the citizens and to automate the processing. The existing cadastre, consisting of paper map/plans and land registers, is now becoming insufficient. One of the best solutions at the local level is the creation and development of a digital plan and a database, as an implemented instrument used to sustain the institutional capacity, the local planning and progress, able to contribute when taking decisions for everyone's benefit. A digital cadastral plan can be the basis for additional thematic layers, successively converting it into a complex system for management of administrative units.

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