

ELABORATION OF THE CADASTRAL PLAN IN THE REPUBLIC OF MOLDOVA BY THE METHOD OF DETERMINING THE POINTS IN PLAN AND SPACE

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Abstract: The cadaster has meant over time the human activity of inventorying land resources. Following the work, we have mastered the main peculiarities of the cadaster in the Republic of Moldova, penetrating even the smallest details. Having as purpose, since ancient times, the computerization of society, the cadaster, as field of activity, as process and as science, persists in the deepest aspects of the economy. At present, it is difficult to imagine economic relations isolated from the cadaster. Being an information system, the cadaster is the mirror of economic relations. Through a developed information system of the more operational cadaster, negative economic influences will be detected and protective measures will be taken. From what is known in this paper, I can note that an information system of the modern cadaster can only be created on the basis of proper science and practice. Like any structure, regardless of the field, the cadaster structure in Moldova, objectively, is in permanent development. The changes that take place are aimed at improving the quality of services, the quality of information, the methods applied. The method of linear intersections provides for the determination of the location of a point of the terrain (detail of the plane) knowing the length to two lines.

Keywords: cadaster, object, real estate, method, plan.

INTRODUCTION

Identification and description of the object

Item – real estate (fig. 1.1) It is located in the South – East of the Republic of Moldova, in Ștefan-Vodă district, Purcari village, cadastral number 85282150141. The object is located in the eastern part of the village. The real estate borders the land with the following cadastral codes: 85282150140 and 85282150142.

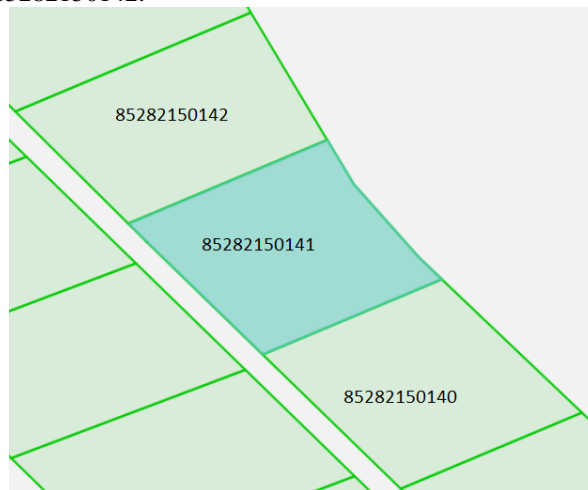


Fig. 1 – Extract from the cadastral plan of Purcari village Ștefan-Vodă rayon

The perimeter of the field sector is 265.7 m. Area of 4016,2 m² which is 0,40 ha.

Figure 1.2 shows an excerpt from the cadastral plan of the village Purcari Ștefan-Vodă rayon superimposed on the ORTHOPHOTO plan of the study sector from which we see that the destination of the immovable property is agricultural, arable use module.



Fig. 2 – Extract from the cadastral plan of Purcari village the Ștefan-Vodă rayon superimposed on the ORTOFOTO plan

MATERIALS AND METHODS

Description of the method of determining points in the plane and space

The method of determining the points in the plane and space or the method of determining the boundary points can be achieved by several methods, namely:

- 1) method of erasure;
- 2) method of abscises and orders
- 3) method of linear intersections;
- 4) angular intersections method.

Application of the method of erasure

Radiation is the determination of the location on the cadastral plane of a point of the land, knowing the distance to it and an angle applied to a line, the location of which is known in space [Herbei, 2002].

Radiation method is most often used, being applied in any terrain conditions. It defines the position of a point in plane and space according to polar coordinates, angles and polar distance. It is stationary with the device at a known point - point of the lifting network. The network is done through roading. It is aimed at the radiated points, read the angle of inclination, distance and orientation [Herbei, 2015].

Figure 1.3 shows the determination of the boundary points of the real estate with the cadastral number 85282150141, by the method of erasure.

Thus, the lines from point 1 to point 2 and from point 2 to point 3 are known, used as the lines of tightening of triangulation or roading (baseline); angles „a”, „a”, „ac”, „d”, „e”; lines A2, B2, C2, D3, E3 [Popescu, et al., 2016].



Fig. 3 – Determination of boundary points by the method of erasure

Application of the method of abscises and orders

Next, the following terms are used in the study of the abscises and orders method:

- **abscissa (x-axis)** - a horizontal line that determines the position of a point on a plane;
- **order (y-axis)** - the vertical line that determines the position of a point on a plane.

The method of abscises and orders is a determination of the location on the cadastral plane of a point of the land, knowing its horizontal and vertical position (intersection of abscise and order) [Gînju, Guțu, 2003].

The method of abscises and orders is based on the road sides and is used in cases where the terrain is approximately horizontal.

In the case of applying the method of abscises and orders, the sides between two points of a path will be recognized as the direction of the abscise. The vertical line lowered to a point or point of travel will be recognized as ordered.

The method of abscises and orders is used more often in cases when the object under investigation has a sinuous form (lakes, rivers, forests, etc.) [Marian, 2022].

The application of the abscises and ordinances method to the determination of the boundary points, for the real estate located in the Ștefan-Vodă rayon, Purcari village cadastral number 85282150141, is shown in figure 1.4. Thus, at the intersection of the abscissa x_1 and the ordinate y_1 , the spatial location of point 1 is obtained, in the same way, the determination of the other boundary points is made [Schulte, 2014].

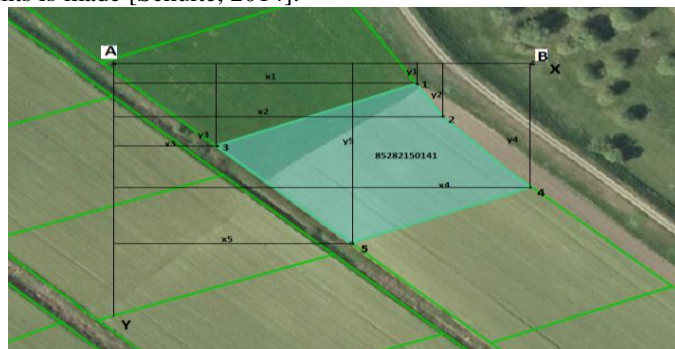


Fig. 4- Application of the method of abscisses and orders

Application of linear intersections method

The method of linear intersections provides for the determination of the location of a point of the terrain (detail of the plane) knowing the length to two lines.

The linear intersections method is applied for flat land without obstacles.

The application of the method for determining points in plane and space by the linear intersections method for the field sector given for the study is shown in Figure 1.5, where l_1 and l_2 are known. At the intersection of these two lines is obtained point 1, analogically will proceed to the determination of the other points [Puie, 2019].

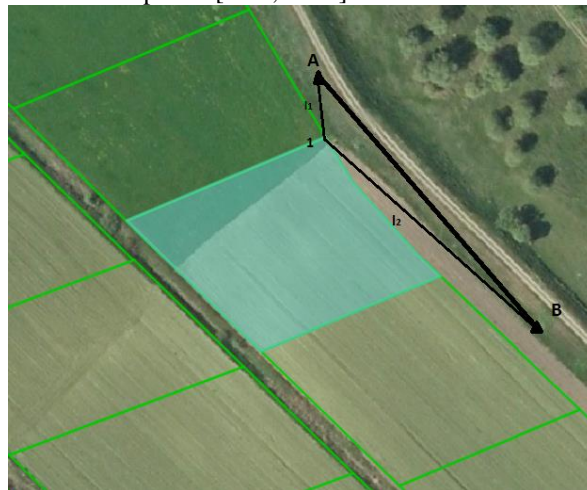


Fig. 5- Application of linear intersections method

The method of linear intersections is applied more often in constructed spaces (perimeters) (localities) and consists of the plan metric determination of the points by measuring at least two horizontal distances from known points. For control, the distances on the perimeter of the detail are also measured [Popescu et al., 2012].

When using these methods it is recommended that the distances do not exceed 50 m. The reporting on the plan is done by describing arcs of circle, having as rays the measured distances and as center the known points.

Application of angular intersections method

The angular intersections method provides for obtaining the location (the graphical representation of a cadastral plane) of a point in space knowing only the angles oriented to the base line (road or another base line) [Botnarenco, 2006].

This method is used more often when the point to be represented on the plane is placed over an aquatic object, another land where the measurement of lines is impossible.

The angular intersection method used to determine the boundary points of the real estate with the cadastral number 85282150141 is shown in figure 1.6. Thus, the A-B side is known as the base line (route), the same is known as the value of the angles "a", and "ab". At the intersection of these two angles, point 1 is obtained. In the same way, all the milestones are determined [Tudor, 2016].



Fig. 6- Application of the angular intersections method

Description of the procedure for coordinating the cadastral plan: elaborated, updated, identified

The cadastral plan of the territory is by itself a graphical representation of the territory (space of an administrative-territorial unit), which contains data on the location, boundaries of land, buildings, buildings, other real estate registered in the register of real estate, their cadastral numbers, as well as other data established by the normative acts adopted by the central public authority in the field [Tarolli et al., 2019].

The cadastral plan of the real estate contains the graphic and textual information about the land and all the constructions located on it and is prepared based on the geodetic works, executed in the single, national or local coordinate system. It is elaborated in 3 copies: the first is given to the owner of the real estate, the second is given to the town hall, the third is given to the territorial cadastral office [Nistor, 1996].

The elaboration of the cadastral plan includes in itself a complex of actions to determine the location of the boundaries and limits of the elements that form the object of the cadastral plan. One of the main actions in the elaboration of the cadastral plan is the delimitation of the boundaries of the administrative-territorial units. The delimitation is a complex of technical and legal actions, carried out on the ground, through which the boundary lines of the administrative territory of a commune, city, municipality, district are established and materialized. The contents of the cadastral plane are shown in Figure 1.7. The process is carried out by a governmental or district commission and is considered concluded after the drawing up of the delimitation documentation and the adoption of the Government decision on the approval of the borders [Herbei, 2007].

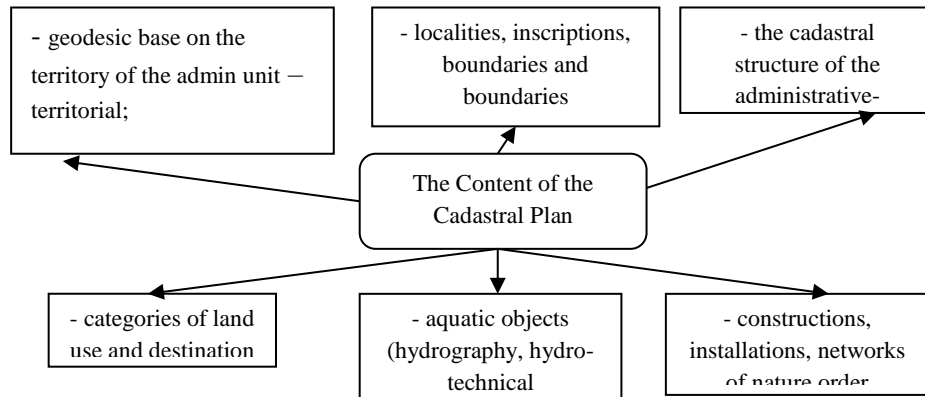


Fig. 7- The Content of the Cadastral Plan

After the border delimitation actions are completed, the points and the boundary lines become elements of the cadastral plan. The establishment of the line within the given locality is related to the maintenance of local public authorities, modifying the categories of land destination in case of necessity [National Geographic, 2021].

Coordination is by itself a very and very important element. The very purpose of coordination is to minimize disputes that may arise in terms of knowledge and location of new boundaries in accordance and coordination with existing ones. Coordination allows for peaceful resolution, and even helps to eliminate potential conflicts that may arise in the future due to the location of new borders. The coordination of the cadastral plan is a guarantee of efficient accomplishment of the work of the cadastral office. In the process of drafting cadastral plans there are situations when referring to a concrete territory, topographical or cadastral plans are old. These plans have not been maintained but they still retain satisfactory content and precision and can be used for cadaster purposes. In these cases the old plans are to be updated [HERBEI,2015].

CONCLUSIONS

So, „the cadaster” has meant over time the human activity of inventorying land resources. Following the work, we have mastered the main peculiarities of the cadaster in the Republic of Moldova, penetrating even the smallest details.

Having as purpose, since ancient times, the computerization of society, the cadaster, as field of activity, as process and as science, persists in the deepest aspects of the economy.

At present, it is difficult to imagine economic relations isolated from the cadaster. Being an information system, the cadaster is the mirror of economic relations.

The cadaster mechanism, by its content, does not admit economic relations with negative social or ecological impact.

Through a developed information system of the more operational cadaster, negative economic influences will be detected and protective measures will be taken.

From what is known in this paper, I can note that an information system of the modern cadaster can only be created on the basis of proper science and practice.

Like any structure, regardless of the field, the cadaster structure in Moldova, objectively, is in permanent development. The changes that take place are aimed at improving the quality of services, the quality of information, the methods applied.

The role of the cadaster in society is to form real estate, protect rights, describe real estate, and disseminate ample information about real estate requested by the national economy.

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