

THE ANALYSIS OF THE CARTOGRAPHICAL MATERIALS ACCURACY IN ORDER TO GIS IMPLEMENTATION IN AGRICULTURAL CADASTRE OF MOLDOVA REPUBLIC

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Abstract: *In this article it was effectuated analysis of cartographical material altime-try and planimetric raising results accuracy in order to elaborate the Geographical Information System (GIS) on the territory of Republic of Moldova. The topical interest of the present study is conditioned by the implementation of the Geographical Information System (GIS) in different activities such as: the creation of information system of agricultural cadastre (ISAC), agricultural sector subvention, land fund and localities space administration, exploitation of city networks.*

These activities are at the initiation stage and because of this the problem may be solved only through an ample preparation of the specialists as well as a detailed analysis of the database that will be used later.

Key words: *Agricultural cadastre, Agricultural sector subvention, Information System of Agricultural Cadastre (ISAC), Geographical information system (GIS), Land owner.*

1. Introduction

The Geographical information system (GIS) became an important element for the space administration of Moldova Republic territory and insurance of harmonious space development. The GIS is successfully used in the study of land utilization way in agriculture; of agricultural grounds evaluation; urbanism; territory engineering arrangement; environment monitoring, analysis erosion processes, agriculture planning, etc.

By definition, the agricultural cadastre represents an information system about lots together with buildings equipment and arrangements places on them.

The contemporary cadastre is inseparable of GIS and thus it became due to the GIS.

By these axioms we are forced of objective necessity for knowing the interaction: agricultural cadastre-GIS and namely:

- the most actual and perspective necessities of real estate cadastre and no less of those of specialty at the same time:
- the most progressive capacities of GIS for satisfying the needs of cadastre at the national level.

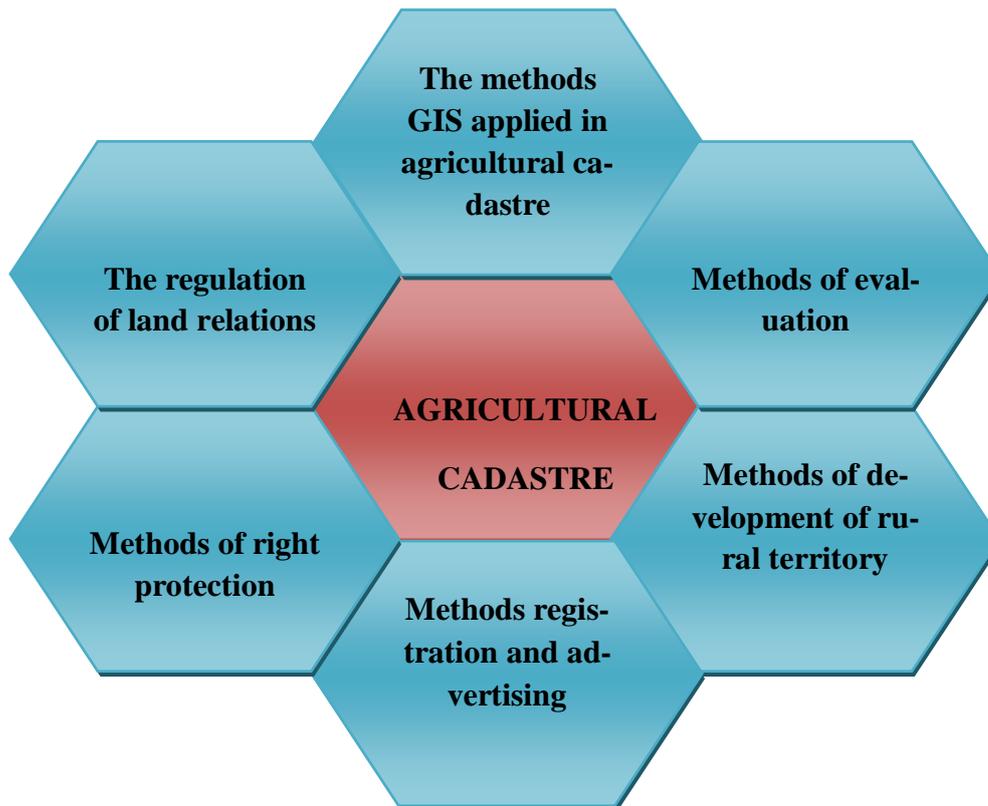


Figure 1. The multifunctional and methodological structure of agricultural cadaster
Source: elaborated by the author on the basis of effectuated studies.

The multifunctional integrity of agricultural cadaster is also being manifested by the interaction of different processes in solving of the *common goal-social-economic durability*.

As a notion the GIS appeared relatively not long ago about 30 years ago.

At the same time as one has already ascertained both the necessity and the purpose have the capacity to evolve simultaneously with the society development.

From this point of view the GIS represents an interpretation of current space information necessities and of a concrete goal oriented to the solving of this need. It is necessary to ascertain the GIS components appeared at once with the society.

The elaboration of various maps (plans), topographical (geodesic) methods for formulating a space information is former. At the same time the GIS phrase is relatively new. What is the motivation?

The GIS phrase appeared at once with the necessity to confirm the honest and multifunctional content of GIS. It is appeared as an information necessity as a result of obtained progress in the domain space measurements technologies.

For this purpose are used the database collected by different methods with various equipment and devices. The accuracy, structure and volume of database are destination function, the GIS having a vast enough domain. In the present work are analyzed the materials from the qualitative point of view of the results of measurements categories in the lot destined to make up of the cartographical materials /especially of top-cadastral plans/suit to the complexity degrees of the zones so to the requirement degrees in rendering of surfaces values, graphical material scale and the methods of making up of these ones. But the qualitative technical conditions for topographical measurements on the lot on large scales are being established according with the requirements of technical normatives depending on destination. For the urbanism work and territory systematization it is necessary a very high quality. In accor-

dance with the requirements in force it is recommended to be used in the mentioned domain cartographical materials on the scale 1:500-1:25000 and for the land with agricultural destination 1:200-1:5000. In order to elaborate the materials named above, in instructions there is indicated the planimetric accuracy of 0,5-0,7 the given scale or 0,25-7,5 m. This accuracy directly influences on measurements accuracy and thus on equipment and raising methods. One should notice that in present with the introduction of new apparatus especially of GPS receptors and electronic tachymeter, with the interpretation of the measuring data on magnetic support, of new photogrammetric apparatus and means of automatic processing it is always being outlined new working technologies changing not only old raising technologies but also the methods of making up, bringing up-to-date of cartographical materials.

2. Material and method

It is known the fact that cartographical materials can be made up by different methods and at the same time with various accuracies. But one should yet mention the accuracy of cartographical materials depends on used methods on making up. The cartographical materials may be made up on the basis of cosmic, aerial and terrestrial raisings. As a result of processing of measurement data today as a rule it is elaborated digital plans in electronic forms. Also for many applications it is being accepted the digitization of already existent topographical materials. These materials have different degree of quality from accuracy point of view. The size of accepted accuracy is of 0,3 mm (10 % from the points and named objects may have errors up 0,5 mm, that is permitted according to the instructions in force.

The cartographical materials accuracy is characterized by maximum error in planimetric position of characteristic points of the details and contours, in comparison with the most approached points from the raising network-size that should not surpass:

- 0,5 mm of plan for the well definite points on the lot;
- 0,75 mm of plan for the points that are not marked permanently on the lot;
- 1,0 mm on the plan are points of variable limits.

But some instructions may establish more raised requirements. Because of this it is necessary to change the needs that all of them be unique, for example, in the instructions for execution of cadastral works it is recommended: 0,3 mm.

3. Results and discussions

The affected analyses on the measurements of data with electronic tachymeters show that the accuracy is much more raised than the plans one. For instance, the position of a point in relation with the station point will be function of distance measurement and angle one. The electronic tachymeters have the accuracy of 0,3 (seconds) of angles measurement and the accuracy of position will not surpass 5 cm for effected measurements with the tachymeter of 7 (seconds). The made up plans in digital form have an advantage recognizing in comparison with the traditional cartographical materials and the appeared error because of drawing is expected. But this error as we know is accepted up 0,3 mm.

Analyzing the terrestrial raising results it was ascertained that the position of the points is also influenced by the way of marks choice. In the case of raising with electronic tachymeter of the dim points their deviation in some cases reaches the value of 0,5-1 m. Thus the planimetric position of these points for the majority of scales will be an independent size.

4. Conclusions

1. The contemporary raising results have an absolute accuracy that will not change depending on the scale being a very important thing that must be taken into account on GIS elaborating.

2. The form and size of agricultural exploitations may be established with a satisfying accuracy in the works of making up of cartographical materials.

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