

## THE IMPLEMENTATION OF SYSTEMATIC CADASTRE IN THE COMMUNE OF GURA RIULUI, SECTOR 29, COUNTY OF SIBIU

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**Abstract:** Under the National Cadastre and Land Register Programme launched by the National Agency for Cadastre and Land Registration (ANCPI) in Romania, the systematic registration works initiated by the local territorial units (LAUs) are financed according to the law on cadastre and land registration no. 7/1996 republished with subsequent modifications [1]. Their object are the cadastral sectors within LAUs that include real estate properties outside the built-up areas or, in the absence of land outside built-up areas, at the level of cadastral sectors inside the built-up areas, irrespective of their owner or holder. The aim of the Programme is to accelerate the development and implementation of cadastre in Romania, to register properties into the integrated cadastre and land registry system, free of charge. It is also aimed at developing and implementing the cadastral map of real estate properties and at opening the land registers at the level of all territorial units in order to support the implementation of the new payment schemes in agriculture. Thus, the present paper presents the implementation of systematic cadastre in Sibiu, Gura Riului commune, in sector no. 29.

**Keywords:** systematic cadastre, cadastral sector, local administrative units (LAUs).

### 1. Introduction

The Romanian National Agency for Cadastre and Land Registration (ANCPI) determined the cadastral sectors (the unit of surface area bounded by stable linear elements - roads, waterways, canals, dams, railways, etc.) for the entire LAU, in order to ensure the management efficiency of record-keeping at LAU level. Thus, the cadastral sector in which we carried out the measurements and later the documentation is part of the LAU of Gura Riului commune in Sibiu County, registered under no. 29.

The commune of Gura Riului is located 18 km far from the city of Sibiu, in the area called “Marginimea Sibiului.” It spreads over a total area of 10,740 ha and it has 3,621 inhabitants. The following LAUs are neighbours of the Gura Riului commune: to the north – the LAU of Orlat commune, to the west – the LAU of Jina commune, to the south – the LAU of the communes of Rasinari, Poplaca and Cristian, and to the east – the LAU of Cristian commune [2] (Figure 1):



Figure 1 – Location of Gura Riului LAU, county of Sibiu

For better viewing of LAUs, the cadastral sector plan is represented in Figure 2 as part of the Preliminary Report, which includes the LAU limit, the boundaries of the building components, boundaries and numbering of the cadastral sectors and the orthophoto.



Figure 2 – Boundaries of the Gura Riului LAU

The numbering of cadastral sectors was made using Arabic numbers starting from number 1 in the northwest of the LAU territory and continued in an increasing order so as to cover the entire territory, up to the last sector in the south (Figure 3):

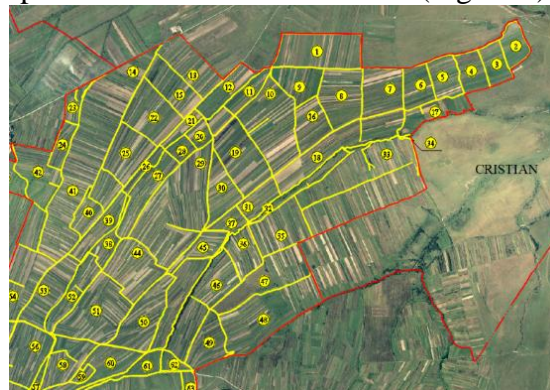


Figure 3 – Numbering of the cadastral sectors

A photogrammetric flight with the help of a drone was carried out by our company inside the built-up area of the commune in order to obtain a clear orthophoto, so that the buildings located in the Gura Riului LAU could be easily identified. Drone mapping was not possible outside the built-up area because of the high costs involved. With the help of orthophotos, it was also possible to identify the land that was joined for farming purposes, belonging to several owners.

## 2. Materials and methods

Measurements in sector no. 29 were carried out with modern GPS devices and total stations, and the processing was done with specialized software. For the fields located outside of the built-up area, the measurements were made using three Leica 08 GPS systems. For measurements outside of the built-up area of the commune, the total Leica T407 station was used.

### 3. Measurements and data processing

#### a. Outside of the built-up area

The data were obtained with GNSS technology using the Romanian Positioning System ROMPOS in the areas with GSM signal coverage, but also with the RTK (base-rover) method, using UHF radio technology transmitted from the national network points in the areas without coverage.



Figure 4 - Permanent ROMPOS stations



Figure 5 – Measurements using UHF radio technology

After completing the measurements, all the GPS data were downloaded to a USB stick to be transferred to a computer. From the GPS main menu, the Job & Data option was



chosen to create a new Job, to view it, as well as to import and export the data (Figure 6). The Export & Copy Data option was chosen, then the file type for downloading data, such as Ascii, XML or DXF. Export Ascii was chosen to download the coordinates to the automatically created Data folder. The support for data export is then chosen (USB Stick or SD Card) and the Job name is also chosen (Figure 6).



Figure 6 - Stages of GPS data download

The data downloaded on a USB, in the Data folder (Figure 7), contain a text file with all the measured coordinates.

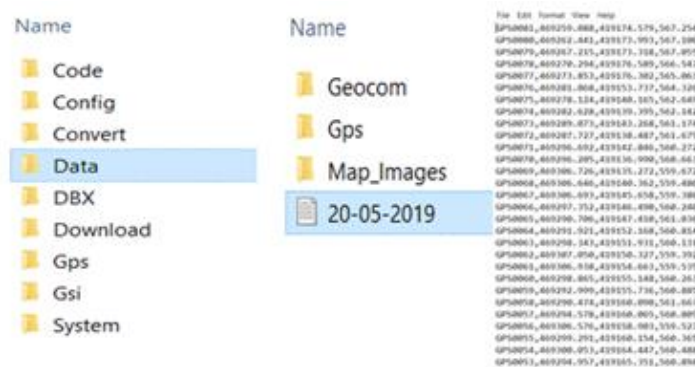


Figure 7 - Coordinates file

**b. Inside the built-up area**

Measurements were performed with the Leica TC407 total station. These data were processed using automated computational programs, resulting in the coordinates of the detail points.

**4. Results and Discussion**

The site plan was drawn up using AutoCAD. Following the reporting of the points, we started drafting the plan, which consisted in representing on a flat surface the results obtained from the topographic measurements and their processing. After joining the detail points measured on the ground, we were able to determine the shape of the plot of land in the cadastral sector. Afterwards, we began drawing up the plot plan using property ownership documents. (Figure 8 – Cadastral Plan).

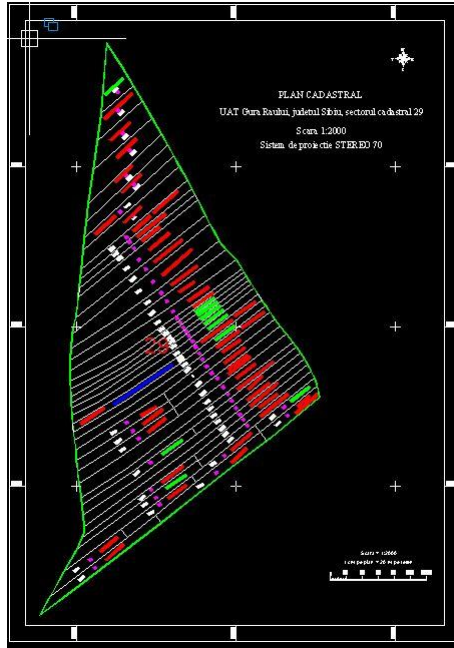


Figure 8 – Cadastral plan for sector no. 29

## 5. Conclusions

A number of problems arose during measurements and surveying mainly due to differences of land size. The commune of Gura Riului is located in an area which was not part of a cooperative during the communist regime. Furthermore, few inhabitants own property documents or title deeds. Their lands were registered in the agricultural register, where the land was declared and not measured.

In these cases, the field areas were collected at the level of the sector and compared with those recorded in the agricultural register. If the land was less, it would decrease proportionally depending on the surface or if it was more, it would be added.

Another problem was that of the misplaced site and position plans, which did not accurately observe the boundaries of the estate. These were to be repositioned following the measurements and after the cadastral plans were drawn up. (Figure 9 – site and position plan incorrectly placed).



Figure 9 – Site and position plan incorrectly placed

As shown in the above image, the geometry of this property is misplaced as compared to its boundaries, as it is placed on the water pipe that supplies Sibiu County. Therefore, this geometry needs to be rebuilt and re-entered into the cadastral plan and land book.

## 6. Bibliography

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