DESIGN OF AN INFORMATION SYSTEM FOR THE AGRICULTURAL COOPERATIVE NEDOŽERY-BREZANY

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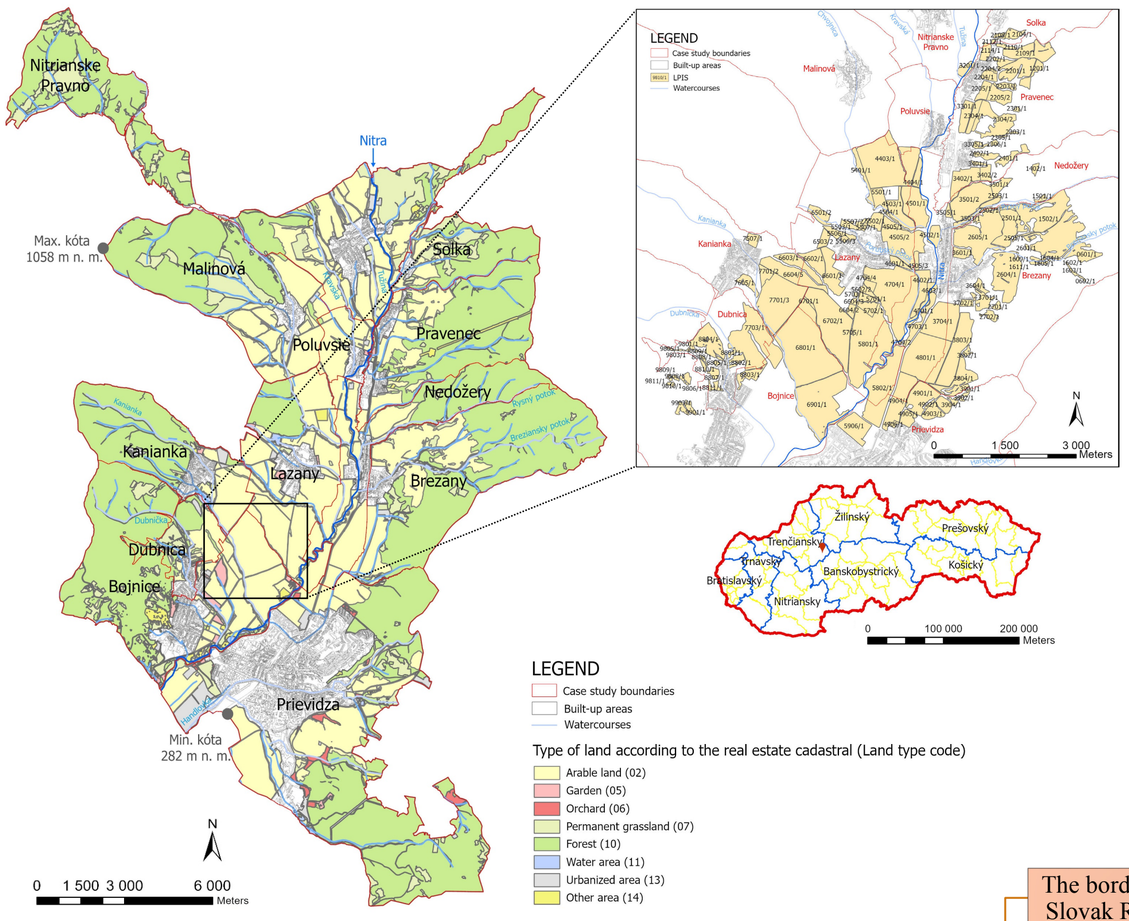

Figure 1: Map of the current land use with details of managed land units

INTRODUCTION

For agriculture, information on soil units is an important factor influencing overall production. With a help of information systems in agricultural production, is it possible to monitor the soil, its features and obtain detailed information on agricultural land. Geographic information systems (GIS) are widely used in agricultural production. In particular, they function for the obtaining, storage and analysis of related data that are spatially bound to the earth's surface.

The goal of the thesis is design and build up of the information system for the Agricultural Cooperative Horná Nitra (PDHN) based in Nedožery-Brezany (district Prievidza). The information system is focused on the characteristics of individual soil units and the surrounding environment, which is managed by PDHN.

MATERIAL AND METHODS

The thesis uses procedures related to the preparation of layers in ArcGIS Pro followed by publishing in ArcGIS online. We managed to process a detailed characteristic of 140 land units with an area of 2264,52 ha, which is farmed by PDHN. Based on the maps of the Real Estate Cadastre and the reconnaissance of the area, we prepared a graphic underlay for the current use of the land. We created a database of LPIS blocks. Individual information were obtained from PDHN internal sources. We used the universal equation - USLE, to calculate the soil loss. We determined the coefficient of ecological stability according to formula expressing the degree of anthropogenic influence in terms of ecostability. These input data were analyzed and then necessary databases were developed based on them. Through ArcGIS Pro, the pre-prepared layers with legends and data in the attribute table have been shared through our ArcGIS online account. In the Web application, we set the necessary templates, icons and completed the overall visual page of the information system. The content of the information system consists of shapefile layers based on which the user can find out essential information about LPIS blocks. After consultation with the management of the agricultural cooperative, we included 21 shapefile layers among the shared layers.

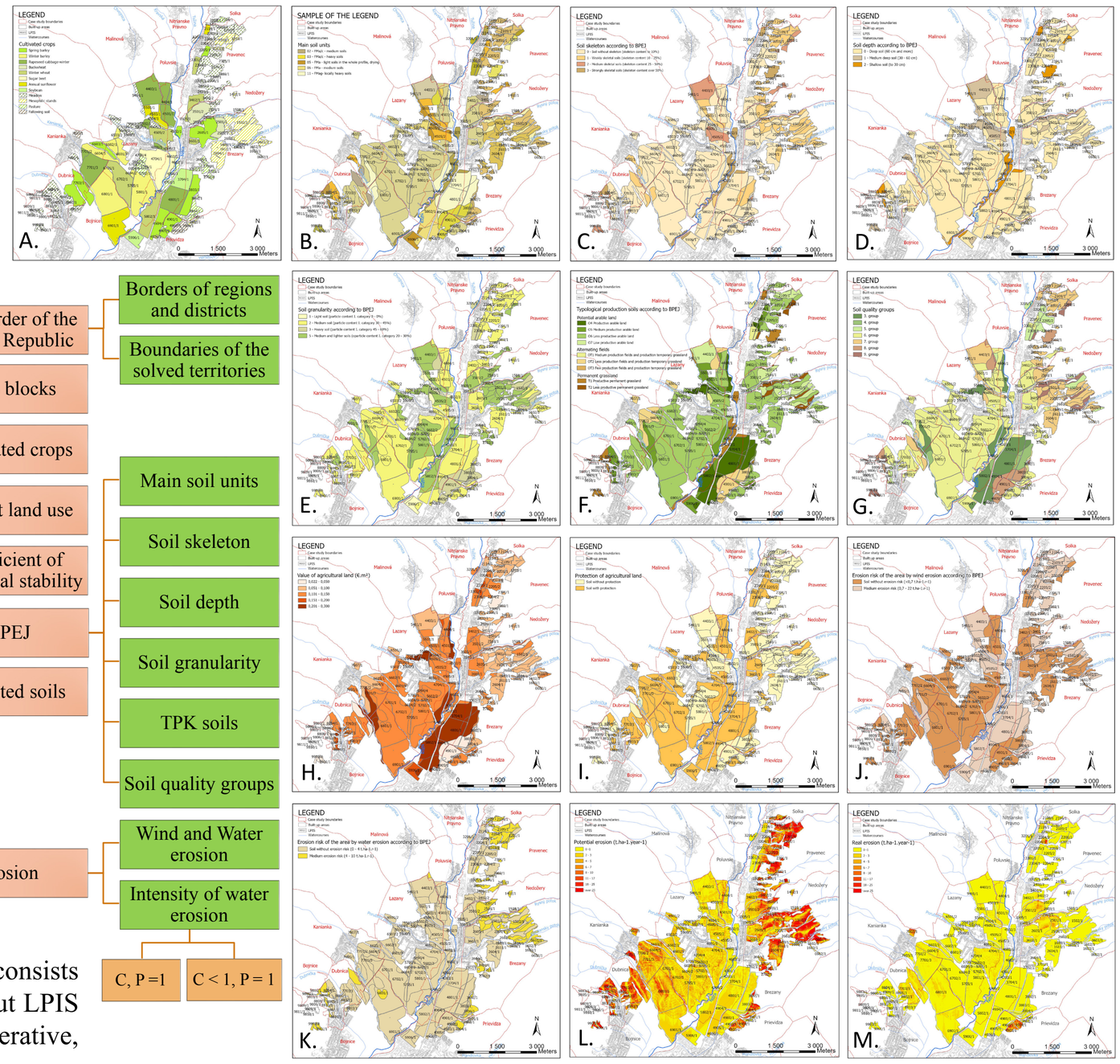

Figure 2: Schematic representation of used map layers in IS PDHN

(**A**-Cultivated crops, **B**-Main soil units according to BPEJ, **C**-Soil skeleton according to BPEJ, **D**-Soil depth according to BPEJ, **E**-Soil granularity according to BPEJ, **F**-Typological production soils according to BPEJ, **G**-Soil quality groups, **H**-Value of agricultural land, **I**-Protection of agricultural land, **J**-Wind erosion, **K**-Water erosion, **L**-Potential erosion, **M**-Real erosion)

RESULTS

PDHN keeps records of soil units in a written form. These are outdated and confusingly processed in many cases. The information system is designed because of modern archiving and innovation of individual data on cultivated soil to an electronic form. On-line mediated layers provide to PDHN employees, along with public, the opportunity to get to know the features of the soil, the surrounding landscape and erosively endangered localities in the managed LPIS blocks. At the beginning, the user can expand and click on the desired shapefile layers using the Layers icons. Layers can be customized as needed: zoom in, make it more transparent, turn pop-ups on / off, change layer order, view attribute table and system details. The user can change the base map, print a map report or measure the distance between certain points. The online version of the PDHN Information System is available at https://arcg.is/1n0Cn00.

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REFERENCES

PIPÍŠKOVÁ, P., 2020. *Design of an information system for the agricultural cooperative Nedožery-Brezany: Thesis. Nitra: SPU. 96 s.*

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