# EVALUATION OF WOODY PLANTS LOCATED IN RURAL PUBLIC PARK AREAS

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**Abstract**
The composition of woody plants as well as their species composition in rural public settlements is diverse and depends on many factors; from the layout of the settlement structure, through cultural and historical ties, up to the landscape in which the settlement is located. The change of approach in the green public spaces creation during the past years has brought woody plants to solid position in case of rural environment shape; not only in the form of composition, but also in the valued fulfilment of many other important functions of rural public spaces. The current climate change, which trees must face also plays a crucial role. Visual value and their prosperity are a reference to the functioning and use of space in these areas. The aim of the paper is to evaluate woody plants species in selected model areas, which represent park groupings located within Slovak lowlands. The premises represent highly frequented places in the central spaces of the countryside with various connections to the surrounding functional areas. The evaluation of woody plants was carried out at the level of the fourteen analysed aspects and values against the selected monitored functions. Their performance was reflected in the three qualitative categories of performance in which they were evaluated. The paper outlines the quality of woody plants in the evaluated areas and contributes to their objectification in the assessment.

**Key words:** countryside, rural renewal, rural public spaces, visual value

## Introduction

The green areas are located in the central parts of the settlements but also in the wider centre and fulfil various functions as they are places where the population movement is concentrated. Places in the centres had in the past and still have a great cultural and social importance and the appropriate composition of trees is very important for achieving the desired functions of public green space and at the same time it is also important to meet the safety of operation as well as the overall connection of green areas with important buildings in the settlement (Frolec, Vařeka, 1983), (Rózová, Supuka, Klein, Jasenka, Tóth, Štefl, 2020). The creation of central areas and plan formations of greenery should take into account not only the proportional-spatial possibilities but also the overall architecture and character of the surrounding buildings (Supuka, Tóth, Bihuňová, Verešová, Šinka, 2020), (Tóth, Bihuňová, Kuczman, Halajová, 2018). Especially important is the selection of appropriate tree forms with suitable visual qualities as well as the overall composition that will support the long-term stay of people in the space (Kuczman, Feriancová, 2013), (Tóth, Feriancová, 2013). Typical for central zones are more massive tree canopies, larger volumes and masses of greenery as well as more concentrated arrays of groups of trees and undergrowth shrubs (Rózová, 2001), (Kuczman, 2018). Central zones have varied over periods in the past and have always served the function of promoting social interactions between the local population, traders as well as those passing through the sites. The central zones, together with the flat formations of greenery, created an environment where people spent a lot of time. The places fulfilled a meeting and recreational function, where people spent time not only passively but also actively, when they were used for important cultural events such as weddings, fairs, feasts and other seasonal activities (Mareček, 2005). The importance of these places also lies in the location itself, which was always close to important buildings, amenities, on important streets as well as near sacral buildings (Kuczman, Feriancová, 2019). The central zones together with the greenery were certain representative areas that reflected the abilities of the population, the degree of intelligence as a degree of belonging and cohesion of the population (Mareček, 2005), (Frolec, Vařeka, 1983). The paper focuses on the assessment and analysis of the current state of the area elements of green spaces located in selected model areas of settlements of lowland landscape type of the Slovak Republic. The selected model territories are central zones - village squares, which also define the character of the built-up area and the overall plan-genetic structure of the settlement, which is typical for the lowland landscape type of the Slovak Republic (Bechera, Kuczman, 2020).

**Materials and methods**

The model territories for the paper are rural settlements in the lowland type of the Slovak landscape located in the Trnava region, near the Považský Inovec mountain range and the Váh river. The selected settlements are Drahovce and Madunice and their central zones near the amenities of the settlements.


Picture 1: Views of the researched areas. Author: Bechera, 2022
Location of settlements in western Slovakia. (mapka.gku.sk, 2022) Drahovce (B1) Madunice (B2)

For objective comparison of the results, the following criteria were selected: location within the settlement near the buildings of amenities in the centre of the settlement, the same or similar year of reconstruction and implementation of modifications of the central zone - the studied area, location on the main road in the settlement, similar spatial parameters and size of the area, location in the lowland type of the landscape of western Slovakia.

The current state of the greenery was analyzed, assessed and evaluated on the basis of the methodology for the assessment of tree composition in public spaces of rural settlements of the Slovak Republic (Bechera, Kuczman, 2019). The methodology, which was used in the research of selected spaces, tracks the current state of tree composition (trees and shrubs) in the space in relation to the functions of green space in rural settlements based on the influence and relationships of the characteristics of tree composition and the functions of public green space. The tree composition characteristics are divided into 14 categories and separate elements V1 - V14. The tree composition characteristics are briefly listed as follows: V1 - tree area cover, V2 Tree height potential, V3 Shrub height potential, V4 Visual connectivity of trees, V5 Tree composition, V6 Tree species diversity, V7 Species authenticity of trees, V8 Tree originality, V9 Tree shape, V10 Tree colour , V11 Tree utility, V12 Cultural and historical value of trees, V13 Tree developmental stage, V14 Tree vigour. The methodology monitors the relationships and the effect of the current state of the characteristics of the trees on the functions at the level of efficiency and utilization, specifically on 6 functions of public green spaces in rural settlements, namely: F1 Aesthetic - representative function, F2 Proportional - spatial function, F3 Climate - regulating function, F4 Ecostabilizing function, F4 Cultural - social function, F5 Traffic - safety function (Bechera, Kuczman, 2019), (Bechera, Kuczman, 2020)

Picture 2: Views of the researched areas - current state. Author: Bechera, 2022
Drahovce (B1) Madunice (B2)

**Results**

The methodology works on the basis of the application of input data, which are based on the current state of the art from different observed perspectives - the characteristics of tree felling. The numbers of tree and shrub species, areas and height limits in the area are monitored. By entering the data into the input data table, the QC - quality category in each characteristic is determined. Subsequently, according to the table in the methodology, the performance of the functional efficiency in each feature is determined and the result is the functional efficiency - the sum of the functional efficiency values converted into a percentage value. The results for the model study areas in Drahovce (B1) and Madunice (B2) are presented in the summary table (Picture 3).

| V/F | F1 | | F2 | | F3 | | F4 | | F5 | | F6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B1 | B2 | B1 | B2 | B1 | B2 | B1 | B2 | B1 | B2 | B1 | B2 |
| V1 | ◖ | ◖ | ◖ | ◖ | ◖ | ◖ | ◖ | ◖ | / | / | ◖ | ◖ |
| V2 | ● | ● | ● | ● | ● | ● | ● | ● | / | ● | ● | ● |
| V3 | ● | ● | ● | ● | ● | ● | ● | ● | / | / | ● | ● |
| V4 | ● | ● | ● | ● | / | / | / | / | ● | ● | ● | ● |
| V5 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| V6 | ● | ◖ | ● | ○ | ● | ◖ | ◖ | ○ | / | / | ◖ | ● |
| V7 | ○ | ○ | / | / | ◖ | ◖ | ○ | ○ | ○ | ○ | ◖ | ◖ |
| V8 | ● | ◖ | / | / | / | / | / | / | / | / | / | / |
| V9 | ◖ | ● | ◖ | ● | ● | ● | ◖ | ● | / | / | ◖ | ● |
| V10 | ● | ● | ● | ● | / | / | / | / | ● | ● | ● | ● |
| V11 | / | / | / | / | / | / | ○ | ◖ | ○ | ◖ | ○ | ◖ |
| V12 | x | ○ | x | ○ | x | / | x | / | x | ○ | x | / |
| V13 | ◖ | ◖ | ◖ | ◖ | ◖ | ◖ | ◖ | ◖ | ◖ | ◖ | ◖ | ◖ |
| V14 | ● | ◖ | ● | ◖ | ● | ◖ | ● | ◖ | ● | ◖ | ● | ◖ |

● Full ◖ Partially full ○ Not enough full / Without a relationship x No rating

Picture 3: Public greenery fulfillment table. Author: Bechera, 2022

The model area Drahovce (B1) in the central part of the settlement achieved the most significant functional efficiency for the functions F1 (● - 66,7% ◖ - 25,0% ○ - 8,3%), F2 (● - 70,0% ◖ - 30,0% ○ - 0,00%), F6 (● - 50,0% ◖ - 41,6% ○ - 8,4%).

The results are also evident for evenly spaced greenery with optimal density and composition, and the creation of safety near bus stops and sidewalk intersections. The performance of the functions is also for appropriate composition and proportionality of trees in relation to buildings. However, shrub cover is low and ineffective. The Madunice area (B2) as a model example achieved the best and most significant functional efficiency in the F6 (● - 58,4% ◖ - 41,6% ○ - 0,00%), F1 (● - 46,1% ◖ - 38,5% ○ - 15,4%), F2 (● - 54,6% ◖ - 27,3% ○ - 18,1%). Compositionally, the area is well designed in terms of green space and the amount of green space is slightly lower, which is reflected in the coverage. The composition of trees is very good in terms of vitality but slightly inadequate in terms of age stage. Visual and functional connectivity and security of the space by separating traffic levels through shrub planting is highly appropriate.

**Conclusion**

The studied spaces are similar in functional efficiency results. The space in Madunice (B2) has a smaller area coverage in relation to the surface area. This has little effect on the performance of the functions, given that it is a landscaped and compositionally suitable public space in terms of tree composition. The space in Drahovce (B1) is functionally efficient overall and the tree composition is relatively satisfactory. However, there is a distinct lack of shrubs in the undergrowth, appearing only close to the road as a positive example of separation of the road from the central zone. Overall, this is a visually and compositionally appropriate space in terms of tree composition.

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**Souhrn**
Zelené plochy v centrálních zónách venkovských sídel a v parkových oblastech venkovských sídel patří k nejnavštěvovanějším místům v rámci sídelné struktury. Kompozice stromů i celková architektura centrálních zón často souvisí s historickými stavbami a budovami v oblasti. Kompozice stromů v centrálních zónách a parcích má také historickou kontinuitu a silnou symboliku. V neposlední řadě také významně ovlivňují kvalitu a délku pobytu návštěvníka v prostoru. Příspěvek se zaměřuje na zkoumání a hodnocení dřevinné skladby ve vybraných venkovských sídlech a jejich funkčních zónách z hlediska kvality, kvantity a plnění funkcí veřejné zeleně z hlediska charakteristik dřevinné skladby.

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