

CURRENT METHODS OF ASSESSMENT AND EVALUATION OF URBAN TREES IN SLOVAKIA

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This article provides an overview of the methods for inventory, assessment and economic evaluation of the urban trees in Slovakia, according to the possibility of its application. The objective of this paper is to identify current methods used and determine the reason why they are used in practice. We analysed what causes the problem in decision-making process of urban trees.

Keywords: urban tree inventory, methods of visual assessment, economic value of urban trees

Introduction

In Slovakia the various methods of inventory, assessment and evaluation of urban trees have been applied for a large range of the purposes including planning, maintaining and monitoring of the trees growing in urban areas. These methods differ from each other not only in the type of input data, but especially in the character of the obtained information describing the current state, functions, benefits, ecosystem services and value of urban trees.

According to Raček and Činčurová (2008), the oldest method used in landscape architecture was compiled by Machovec (1987). This method deals with dimensional parameters of the trees – tree height, perimeter of the trunk, diameter of the crown, estimates the age of the tree, and its aesthetic value including actual condition of the tree with respect to signs of senescence and damage. Pejchal (1997, 2005) elaborated method for assessment of the “tree vitality” which takes measure on physiological (damage and reaction to damage) and biomechanical mechanical (resistance to break) part Method for phytopathological assessment of the trees in urban areas has been elaborated by Juhásova and Serbinová (1997). The other authors (Supuka, 1997; Reháčková and Paudišová, 2006) dealt with methods of the evaluation of vegetation in the urban environment for landscape planning. Kubišta (2011) focused on greenery in historic parks with respect to its compositional value.

For effective management of urban trees the reliable information about their actual condition is important. According to Horáček (2012) each design and maintenance of urban trees respecting the law must be based on inventory and visual assessment. Each method for assessment of the urban trees should correspond to the particular objective of the study and use appropriate

parameters that would clearly describe condition and specific value of the tree. This raises the question what method should be selected for what specific purpose to make a correct decision making concerning the urban trees.

The objective of this work is to identify the most commonly used methods of inventory, assessment and evaluation of urban trees and determine the objective of its applications in practice in Slovakia.

Material and methods

43 documents elaborated by experts and professionals dealing with trees (published on line on web) were used as data source for study of the purposes of inventory, assessment and evaluation of urban trees in Slovakia during the last ten years. The methodology is based on literature review. The obtained information was assorted in the table according to the rate of the application and objectives. Within the analysis of the obtained data we try to understand the different approach of the practitioners and experts working with urban trees and establish the basic principles for choice of the representative method of tree assessment.

Results

Based on analysis of 43 documents for planning and maintenance of urban trees in Slovakia it is possible to declare that:

1. There are several methods for assessment and evaluation of trees used by professionals in Slovakia. They often represent a combination of the same, or similar parameters combined each other.

The most frequently used method is Methodology for determination of “social value of tree”, which is established by Act No. 543/2002 of Collection of Acts

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about protection of the nature and landscape ("Act about protection of the nature and landscape"). "The social value of tree" expresses biological, ecological and cultural value of the protected plant species, trees and habitats. This parameter is determined by rarity, endangerment of the species and performance of the non-production functions" (§ 95 of the Act). Edict of NC SR No. 24/2003 of listed Act determinates the economic value of urban trees according to species and dimensions of trees. This value depends on "relative age" of tree (it is estimated for long-lived or short-lived trees). Methodology for assessment of the social value of tree considers also some indexes. The index of damage and negative impact of tree (on static conditions of buildings, utilities etc.) reduces the monetary value of particular tree. Other indexes, based

on functional impact of tree in surrounding area, its rarity or cultural and historical value can increase the monetary value of tree.

2. The same method of inventory, assessment or evaluation of urban trees is applied for different purposes in practice. One method is often used with multiple objectives.

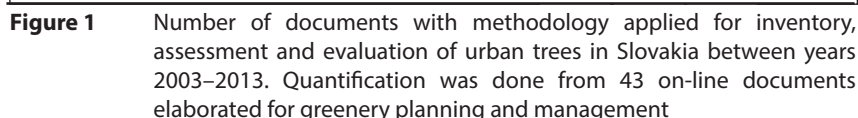
Table 1 describes the scale of different purposes to which the methods of inventory, visual assessment and evaluation of urban trees are applied in practice.

The basic characteristics of a tree (location, taxonomy, dendrometric parameters etc.) are included under each of these methods. Acquired information is suitable for calculation of the "social value of tree" and standard maintenance cost. But these parameters are usually

Table 1 Aims and purposes for the visual assessment of urban trees that has been done in Slovakia between years 2003–2013

Aims and purposes	Applied methodology				
	Machovec (1987)	Pejchal (1997, 2005)	Juhásová (2009)	Dobrucká (2011)	Social value of tree
Tree inventory					
Identification of number of trees in the area					
Identification of species structure					
Identification of age structure					
Measurement of dendrometric parameters					
Assessment of current state of tree					
Assessment of damage of trees					
Assessment of vitality (condition) of trees					
Assessment of biomechanical stability (static) of trees					
Assessment of future perspective (vigorousness) of trees					
Assessing the aesthetic (landscaping) value of trees					
Evaluation of economic value (price or cost) of trees					
Calculation of the economic value of trees in €					
Calculation the price of the replacement plantings in €					
Calculation of the compensation for damaged or felled trees in €					
Calculation of the maintenance costs					
Decision making					
Making decision for tree felling					
Making materials for development of urban reality					
Making Environmental Impact Assessment					
Making Land Use Planning Document (Document of Tree Care)					

The measured/estimated parameter is presented in grey colour



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