



Valuing scattered trees from wood-pastures by farmers in a traditional rural region of Eastern Europe



Tibor Hartel^{a,c,*}, Kinga-Olga Réti^b, Cristina Craioveanu^c

^a Ecosystem Services Laboratory, Department of Environmental Sciences—Sapientia Hungarian University of Transylvania, Cluj-Napoca, Romania

^b Faculty of Environmental Science and Engineering, RO-400294, Fântânele Street 30, Babes-Bolyai University, Cluj-Napoca, Romania

^c Department for Taxonomy and Ecology, Str. Clinicilor 5-7, 400006, Faculty of Biology, Babes-Bolyai University, Cluj-Napoca, Romania

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ABSTRACT

Wood-pastures are agroforestry systems created and maintained by multifunctional management. As such, wood-pasture systems provide a model ecosystem for the sustainable integration of food production and biodiversity conservation. Values attached by the human societies to the woody vegetation from pastures were of crucial importance in shaping the physiognomy of these landscapes and their temporal dynamic. Nevertheless, these values went through sharp changes during the past decades, typically resulting in the transformation of wood-pasture systems either in pastures without trees, high forests or other landuse forms. Here we assess the values of scattered trees (mature and old) from oak wood-pastures by traditional farmers from a traditional rural region of Transylvania (Romania). Our study region is one of the richest ancient oak wood-pasture regions of lowland Europe. Mature scattered trees were appreciated mostly for their tangible values (especially shade for livestock) while old trees were appreciated for their intangible values (e.g. age, beauty and relaxation, cultural identity). When trees were perceived as deteriorating, farmers suggests their removal from wood-pastures. As the hollowing, often drying trees have disproportional habitat values for several organisms, maintaining these trees on managed pastures is a key conservation and sustainability challenge.

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1. Introduction

Wood-pastures are multifunctional agroecosystems managed primarily by livestock grazing, where woody vegetation was valued by the local communities for its multiple services and functions (Hartel and Plieninger, 2014). Wood-pastures are special agroforestry systems; they can have a wide variety of physiognomies, ranging from pastures with scattered trees (i.e. 'savannah-like' system) to more closed grazed woodlands (Goldberg et al., 2007; Rackham, 2013). Values attached to the woody vegetation and grassland component of wood-pastures as well as the ways how these values changed through time had an important driving role in shaping the physiognomy and ecosystem properties of these landscapes. For example the erosion of the values attached to scattered trees on pastures resulted in their trade-off and the emergence of monofunctional pastures (without trees) specialized mainly for livestock (grass) production. On the contrary, the increase of the timber value of trees resulted in

the conversion of several wood-pastures in high forests managed primarily for timber production (Hartel and Plieninger, 2014). The changing societal demands for agricultural and timber commodities, the loss of extensive, multifunctional management the changing land use and nevertheless the policy mismatches (Bergmeier et al., 2010; Beaufoy, 2015; Plieninger et al., 2015) resulted in a sharp decline of wood-pasture systems all over Europe, in the past century.

Wood-pastures of Europe are getting increasing interest, both in the agricultural policy and research, due to their exceptional ecological, socio-cultural and economic values (see e.g. Eichorn et al., 2006; Bergmeier et al., 2010; Beaufoy, 2015; Plieninger et al., 2015 for reviews). Wood-pasture systems indeed have the potential to integrate food production with biodiversity conservation and the maintenance of resilient agroecosystems (Oppermann, 2014).

Despite their overall deterioration and loss in several western and central European countries, spatially extent oak wood-pasture systems are still well represented in Transylvania (Romania) (Hartel et al., 2013; Moga et al., 2016). Wood-pasture systems from Transylvania are particularly attractive for addressing the values farmers attach to multifunctional farming systems and the

* Corresponding author.

E-mail address: hartel.tibor@gmail.com (T. Hartel).

implications of these for multifunctional management. The values and practices which produced and maintained these wood-pastures and their natural and cultural values are sharply deteriorating (Fischer et al., 2012; Hartel et al., 2013), due to the fast socio-economic and institutional transitions these systems undergoes in the recent decades (Hartel et al., 2016). Hence it is of utmost importance to understand the tangible and intangible values represented by sparse trees from pastures to farmers in these rural social-ecological systems.

Our goals were: (i) To explore the values associated with scattered, mature trees (hereafter 'mature trees') with intact crown on oak dominated wood-pastures as perceived by the farmers; (ii) To explore the values associated with large, old oak trees (hereafter 'old trees') with intact trunk and crown from wood-pastures, and finally (iii) To explore the perceptions of farmers related to the old trees which collapsed (hereafter 'collapsed trees') on pastures. We differentiated between the three categories of trees (i.e. mature, old and collapsed) for two main reasons. First, oak wood-pasture systems from our study region are unique in harboring a high number of large, old oak trees (Hartel et al., 2013). These trees confers an outstanding ecological value to these wood-pastures. Second, we expected that the various types of values associated to the scattered trees by farmer's changes as the overall condition and productivity of the trees change with their age. Understanding the types of values farmers associate to various tree age (and condition) categories on wood-pastures, and how these values determine their attitudes and actions towards scattered may help in designing more effective conservation measures targeting these trees on farmland. We discuss our findings also from the perspective the Common Agricultural Policy (CAP) which is one of the most significant policies affecting scattered trees on pastures within the European Union.

2. Materials and methods

2.1. Study area and villages

The study was conducted in the Saxon cultural region of Southern Transylvania (central Romania). The rural region from this part of Transylvania is undergoing major social, institutional and cultural changes (Hartel et al., 2014; Hanspach et al., 2014). While the socio-economic capitals are eroded (the villages being characterized by economic poverty and low community cohesion Mikulcak et al., 2015), the natural capital is well preserved, with high levels of biodiversity and a wide range of ecosystem services (Fischer et al., 2012; Hanspach et al., 2014; Dorresteijn et al., 2015). The characteristic physiognomy of wood-pastures for this region is a pasture with scattered trees, typically oak and pear (Hartel et al., 2013).

The region where we carried out our research on wood-pastures covers ca 3600 km², out of which ca 860 km² are covered by Natura 2000 regulations (Hartel et al., 2013, 2014). Within this region we selected the villages for our study in a way to capture the existing diversity of oak wood-pastures from the region. Every village selected for this study had at least 100 ha of oak wood-pasture in the vicinity. Eight villages were studied, out of which four had substantial number of large, old oak trees in their wood-pastures (i.e. over 20 such trees, as defined by Moga et al., 2016). The human population size in the studied villages ranged between ca 200–600 inhabitants while one locality had ca 1500 inhabitants. This range of rural inhabitants is general for the whole region of the Saxon villages from Southern Transylvania.

The farming technology applied in the study region still retains several features which were common up to the 19th century, including the less use of agrochemicals, the use of human labor instead of large machineries (Fischer et al., 2012). We refer to these

farming practices and the farming landscape physiognomies created and maintained by them as 'traditional'.

2.2. Selecting the interviewees

Farming was a substantial component of the household economy for every interviewed person. Semi-structured interviews were conducted generally at the people's home or in the farmland (see below for the themes and the interview process). The final interviews were preceded by pilot interviews in order to test the applicability of the methods and the reaction of the interviewees. The pilot interviews were carried out on 22 persons about which we knew that they are knowledgeable regarding the agricultural practices and history of their village and region. The pilot interviews were followed by 92 interviews which constituted the sample for our study. Interviewed persons were approached either randomly, or by using the snowball method, that is, potential interviewees were recommended by our local contacts and/or other interviewees. Seven to 18 interviews were made per village. The degree of trust of the interview process was increased with the local origin of the two persons conducting the interviews (TH and Árpád Szapanyos). While everybody from our study region speaks well Romanian (all interviewees being Romanian citizens), if the interviewee requested it, we were able to conduct interviews also in Hungarian. In order to further increase the trust of the participants, we allowed the participation of every person present in the interview process. Major contradictions between the participants in the same interview rarely occurred and if happened, consensus emerged quickly between them. The formal occupation of the interviewed persons was typically diverse (e.g. due to the seasonal employments) because of the regionally low availability of job opportunities. Annex 1 presents for the structure of interviewees.

2.3. The themes addressed in the interviews and the interview process

Table 1 presents the five themes and the associated questions used consecutively in the interview process. The method of photo elicitation has been frequently used as a complementary tool for interviews in landscape and environmental studies (e.g. Surova and Pinto-Correira, 2008; Sherren et al., 2010; Milcu et al., 2014). We also applied this method, by showing characteristic photographs about grazed landscapes and trees in order to assure that the interviewed persons have a good understanding on the broad landscape physiognomies and trees we were interested in. These photographs visualized representative pastures without sparse trees and wood-pastures for the study region (Annex 2) as well as large, old and hollowing oak trees (Annex 3). The pictures originated from the studied region (see above) but from different villages than those selected for our study. We showed no livestock in these pictures, in order to focus on trees and not to have the interviewees distracted by the presence of livestock. For assessing the perceptions and attitudes of rural inhabitants towards old and collapsed trees (themes 4 and 5, Table 1) we used pictures visualizing oaks (Annex 3) because these trees were the most common in the wood-pastures from the studied region, including villages (Hartel et al., 2013). These pictures also represented humans in order to help the interviewee in assessing the relative size of the trees (Annex 3).

We note that the Theme no. 3 ('The use of leaves and acorn as nutrient source for livestock', Table 1) was added after the (and as a result of) pilot interviews. In the pilot interviews the 'tree hay' was mentioned by two (9%) and the use of acorn by five (23%) interviewees, from all three villages where the pilot study was conducted. Given the high importance of tree fodder in traditional farming in Europe (see below) and the scarcity of written

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