



Research article

Trees are all around us: Farmers' management of wood pastures in the light of a controversial policy

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ABSTRACT

Wood pastures are some of the most species-rich environments found in Europe and therefore essential habitats for biodiversity conservation. Society also puts faith in multiple values of trees, ranging from climate change mitigation to socio-cultural traditions. Therefore, the seemingly arbitrary tree density limit for pasture environments imposed by the EU through its Common Agricultural Policy (CAP) threatened both biological and societal values. In this study on farmers' perspectives, we target the effects of the CAP tree density limit on management of wood pastures in a low-intensively managed agricultural landscape of southern Sweden. The case of simplifying nature by using simple number limitations was used as an entry point in semi-structured, open-ended, interviews with farmers and officials about their view on trees and pasture management in relation to policy directives. The interviews showed that the policy incentive shifted the management focus from grazing quality to the number of trees and that farmers are willing to cut in order to get subsidies and timber revenues, however not unreflectingly. Farmers had high knowledge about the wide ranging social, cultural and natural values of trees, and are often themselves as good regulators of tree management as policies intend to be. Our study reveals many difficulties in managing the complex relations within landscapes with simplified legal measures, opening up for further discussion about improving policy instruments to preserve both social and biological values of wood pastures. However, although the tree density limit has been criticised on many points related to biodiversity conservation, this study shows that other values linked to pasture trees, e.g. the aesthetic values and their importance as shelter for grazing animals, could be an argument to actually keep the focus on trees as indicators of pasture management quality. We suggest that trees in general and wood-pastures in particular therefore are good starting points, or boundary-objects, for collaboration between production and conservation interests of farming and environmental management.

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1. Introduction

Throughout the world, trees on farmland are acknowledged as important pathways for sustainability through benefits such as food and fibre, aesthetic values, mitigation of climate change and biodiversity (Jerneck and Olsson, 2013; Peterson, 2005; Plieninger et al., 2012). Trees are also part of many people's livelihood, providing firewood, timber, fodder and material for fencing, although many of these functions have become obsolete or made invisible to European farmers. Hence, trees can be seen as living

monuments of long-term and changing human influence in the landscape (Butler, 2014; Jones and Cloke, 2002).

Within agricultural policy, one of the major challenges for sustainability is how to shift a strong production-oriented farming into more diverse land use practices to support biodiversity values (Burton, 2004; Burton et al., 2008; McGill et al., 2015; Riley, 2011; Saunders, 2015). However, from a policy perspective, the question of how to handle trees is challenging given the compartmentalised model of governing land use in Europe. Agriculture and forestry have during the 19th and 20th centuries developed into two distinct land use categories guided by separated entourages of governing bodies, research, management rationales etc. (Hartel and Plieninger, 2014; Stenseke et al., 2016), where agricultural policy falls under the competence of EU and forest policy mainly falls

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under the national governance. In this process, trees are turned into timber volumes within forestry, whereas on the other side of the administrative ‘fence’ we find the intensively used (tree-lees) farmland as the norm within the Common Agricultural Policy (CAP). This entails that farmers, although they happen to own and manage trees on both farmland and in forests, usually are approached in their role as either a farmer or a forest owner by researchers as well as the compartmentalised administration.

In this context, wood pastures have become trapped in the dichotomy between agriculture and forestry (Bieling and Konold, 2014; Beaufoy, 2014; Roellig et al., 2016). Wood pastures are some of the most species-rich habitats found in Europe, but their social-ecological environments have been poorly acknowledged in a policy perspective, when trying to fit the heterogeneity of European landscapes into clear-cut policy categories (cf. Dahlberg, 2015). Considering the strivings for multifunctionality within the CAP (Wilson, 2009), it is paradoxical that the EU in 2007 imposed a tree density rule of a maximum of 50 trees/ha that encouraged farmers to cut down trees in pastures in order to be granted subsidies (Beaufoy, 2014). This rule changed in 2014 to allow subsidies for pastures with up to 100 trees/ha (European Commission, 2014). However, changes in terms of abandonment and tree cutting practices have already happened in many pastures (Hartel and Plieninger, 2014), and further changes to other arbitrary limits do not seem to be the solution for the conservation of the social-ecological values of wood pastures. In Sweden, the number of appliances for subsidies for pasture management dropped after the tree-density limits was inaugurated, and the removal of giant/dead trees and loss of structural variation of trees (age/size distribution) have had negative biological impacts and resulted in more uniform pastures in line with the configuration of trees in production forests (Swedish Board of Agriculture, 2010).

Due to the high biodiversity values of wood pastures in Europe, it is important to consider the precision of tree density rules from the perspective of biodiversity values. Besides being a rough indicator of abandonment of grazing, tree density may seem a logical limiting factor for biodiversity as trees are expected to have negative impact on plant diversity due to reduced light availability and increased competition (Abdallah and Chaieb, 2012; Grime, 2006). However, as low intensive management continuity is a major driver of grassland plant diversity (Aavik et al., 2008; Cousins and Eriksson, 2002) and trees themselves form important features of high biological values in wood pastures (Hartel and Plieninger, 2014; Plieninger et al., 2015) the logic behind the tree density rule may be questioned from a biodiversity point of view. The value of sun exposed trees in semi-open grasslands for beetles, lichens and fungi is well recognised (Plieninger et al., 2015). Importantly, recent studies on biodiversity patterns in relation to trees within our study area in southern Sweden have shown consistently positive effects of increasing tree density also on species richness of plants, birds and bats (Jakobsson and Lindborg, 2015, 2017; Wood et al., 2017). Given the emphasis within the CAP on environmental values, these results generate a pedagogical challenge for the officials who need to implement a tree density focused policy that might lead to negative effects on biodiversity.

While landscape management in the higher administrative domains is guided by *statistics* on social, economic and ecological facts, what happens among the farmers and other actors on the ground is better understood as *logistics* (Hägerstrand, 2001). Hägerstrand (2001) asserts that there is a wide gap between those who possess scientific evidence and formulate management goals “from a bird’s-eye view of the world, and those who deal with the material realm within their reach”. On-the-ground, we also find biological communities that lack the ability to read maps or directly adhering to shifts in policy, resulting in difficulties to interpret

biological data of landscapes and habitats experiencing structural or compositional changes (Kuussaari et al., 2009). There is therefore urgent need for addressing the gap between scientific evidence and policy making (Geijzendorffer et al., 2015) by linking ecological evidence, policy recommendations and farmers’ perspective to improve the relationship between different actors involved in the development of agri-environmental policy (Rands et al., 2010; Rose, 2015).

Our main concern in this paper is how farmers, who also are forest owners, manage trees on wood-pastures in the light of the “policy-trap” between the agriculture and forestry sector. From a policy perspective, clear categorical boundaries (e.g. between forest and farmland) are needed in order to sort out who is responsible for what type of land use, but such boundaries tend to simplify nature (cf. Scott, 1998). Therefore, research exploring how boundary-making is perceived and negotiated among those involved in converting words, numbers and pictures into actions on-the-ground is needed (Dahlberg, 2015). In this paper, we aim to respond to the need for improved understanding of policy, farming activities and biodiversity by providing insights from wood pastures in southern Sweden. The tendency of simplifying nature is used as an entry point when talking with farmers about their management, views and lived experience of pastures trees and how they respond, adapt and resist to the seemingly contradictory signals coming from subsidy regulation regarding the role of trees in EU policy. By putting farmers and trees in the centre of analysis we open up for discussion on how agriculture policy rationales are filtered by the hands and minds of individual farmers in their daily management of wood-pastures (Ahnström et al., 2010; Hägerstrand, 2001; Stobbelaar et al., 2009; van Vliet et al., 2015). The following questions have guided this study:

- What values do farmers assign to the trees in pastures?
- Which species of trees, and why, are cut and which are spared and how are the trees distributed in the pastures?
- How do official guidelines and EU-subsidy regulations influence farmer’s management decisions and value regarding pasture trees?

2. Material and methods

2.1. Study area

Our case study area east of Lake Vättern in southern Sweden is located south of one of the larger agricultural plains and has traditionally been dominated by dairy production. The area is characterised by a mosaic of different land uses: arable land in the valleys, wood- and other forms of semi-natural pastures (Fig. 1) on the slopes and protected forests as well as production forests on higher levels of the landscape. The hilly structure of the landscape has in many cases forced relatively small scale farming practices to persist. Small pastures are still used, which makes farmers move their animals between these patches several times per year. Also the ploughed crop fields are in some cases still found in remote places in the middle of forests, a sight rarely seen in areas of more intensive crop production (e.g. the plains of central and southern Sweden). In 2012, the study area was designated a UNESCO Biosphere Reserve. Interestingly, the start of the process underlying the creation of this reserve was mainly driven by conflict between land-owners, authorities and local conservation groups regarding turning the forest along the hills of Lake Vättern into nature reserves. Today, the awareness and pride of the socio-ecological values in the area seem to be relatively high among the people living there (Jonegård, 2007; Olsson, 2012). Nevertheless, the

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