

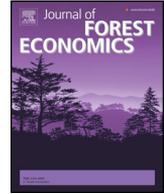


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# Incentivizing afforestation agreements: Institutional-economic conditions and motivational drivers



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### ABSTRACT

The main objective of this study is to estimate and compare farmer demand for afforestation agreements in the Netherlands and Germany under different institutional-economic contract design conditions. Farmers' responsiveness to financial and non-financial incentives to convert part of their land into forest is examined in a discrete choice experiment. Besides landowner and contract characteristics, we test the role of motivational drivers in explaining farmers' willingness to conclude afforestation agreements. These are expected to lower demand for financial compensation. We fix financial compensation levels in contractual agreements relatively low compared to opportunity costs, but comparable to what farmers currently receive for nature conservation measures. Although we find substantial demand for afforestation agreements in both samples, Dutch and German farmers value contract conditions differently. This has important implications for the effectiveness of varying compensation levels on scheme participation rates. Farmers are willing to trade-off financial compensation against non-financial terms and conditions. However, having a positive environmental disposition towards wildlife conservation does not necessarily result in the acceptance of lower levels of financial compensation.

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## Introduction

The importance of forests as natural capital assets that provide a variety of ecosystem services such as wood production, carbon sequestration, erosion prevention, recreational opportunities and wildlife habitat is widely acknowledged (e.g. Lindhjem, 2007; Zanderson and Tol, 2009). The extension of woodland is one of the main objectives of the European Agricultural Fund for Rural Development, which provides for a single measure that should cover the extension and improvement of forest resources through the afforestation of land and the creation of agroforestry systems combining extensive agriculture with forestry systems (Council Regulation, 2013, p. 491). In 2013 the European Commission furthermore emphasized the importance of sustainable forest management, the multi-functionality of forests and their role in a bio-based economy in its new European forest strategy (EC, 2013).

The responsibility for the implementation of European forest policy is with the member states. Many member states aim to increase the amount of forest land within their geographical boundaries. For example, the German Forest Strategy 2020 envisages that “new forest sites, offering particularly advantageous climate benefits and positive effects on nature and landscape, should be planted” (BMELV, 2011, p. 23). To this end the European Union (EU) has developed funding schemes to convert private and public non-forest land into forest land. The success rate of such efforts across member states has been limited, among others in the Netherlands and Germany. For example, under the Dutch Rural Development Program 2007–2013 an extension of the forest area with almost 2000 ha was foreseen (LNV, 2008), but the mid-term evaluation of this program showed that only two subsidy applications were submitted for the afforestation of farmland (Ecorys, 2010). Little is known about the underlying reasons across EU member states (e.g. Duesberg et al., 2014), and hence an important question is to what extent existing afforestation funding schemes are sufficiently differentiated to account for farmer preferences in individual member states.

The main objective of this study is to assess and compare the sensitivity of farmers in the Netherlands and Germany to financial and non-financial incentives to convert part of their land into forest using contractual agreements. Based on findings for agri-environmental agreements (Christensen et al., 2011), we are specifically interested in farmers' willingness to trade-off financial and non-financial terms and conditions in afforestation agreements, in particular accept less compensation for less restrictive participation requirements. We estimate farmer demand for afforestation agreements in the two countries under different framing and farming conditions using a discrete choice experiment (DCE). Farmers are offered a ‘menu’ of contracts to identify different types of farmers and market segments (Ferraro, 2008). Varying contract characteristics in the DCE forms the basis for identifying key institutional-economic terms and conditions for the purpose of informing more effective future contract design (Teskaye and Brouwer, 2012).

Two different EU member states are selected with different types of farming systems and farm land prices in order to avoid country specific biases in the results. The Netherlands have relatively high land prices and small, highly specialized farms, while farm land prices are relatively low in Germany compared to other North–West European countries, and farms are, on average, large and more mixed. Another influencing factor might be existing forest cover, which also differs between the two member states (Forest Europe, 2011). The only other study we know that focuses on farmers' willingness to conclude afforestation agreements on agricultural land in Denmark shows that differences in surrounding forest cover do not influence farmers' participation rate (Broch et al., 2013) and farmers are willing to accept less compensation for compliance monitoring at higher subsidy levels (Vedel et al. (2015)).

Hardly any studies exist focusing on afforestation on agricultural land, let alone comparing demand for afforestation agreements between member states. Most studies examine the amount of financial compensation needed to conserve forests (instead of afforest), targeting forest owners in one particular area and using either revealed (e.g. Kilgore et al., 2008) or stated preference data (e.g. Horne, 2006; Matta et al., 2009; Layton and Siikamäki, 2009; Lindhjem and Mitani, 2012). Typically these studies find that it is a combination of landowner and scheme characteristics that determine participation. Similar results are found in DCE studies focusing on agri-environmental agreements (e.g. Espinosa-Goded et al., 2010). Besides focusing on landowner and contract characteristics, we also test the role of

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