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How cost-effective are result-oriented agri-environmental measures?—An empirical analysis in Germany

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ABSTRACT

Agri-environmental measures (AEM) are the central area-based measures of the second pillar of the Common European Agricultural Policy. Cost-effectiveness of AEMs has to be improved. In this paper a newly designed AEM called result-oriented incentive is empirically analysed for the first time concerning its impacts on environmental effects and cost.

Result-oriented financial incentives are linked directly to the desired environmental objectives and allow farmers to choose the most efficient way of management to reach them on their own. In this paper, we present the results of 90 interviews with farmers who have participated in a result-oriented AEM in Baden-Wuerttemberg (Germany). We investigated potential advantages (flexibility, innovation, higher intrinsic motivation and improved continuous adaptation). In addition, we researched disadvantages (transaction costs involved in control efforts, risk for farmers). Our results show that such kind of AEM has a positive impact on cost-effectiveness. However, the concrete design and the implementation process of these AEMs play a crucial role for their successful application.

Introduction

Agri-environmental measures (AEM) are an increasingly important instrument for the conservation and promotion of environmentally adapted agricultural land use. Based on Council Regulation 1698/2005 AEMs are a mandatory part of the Rural Development Plans (RDP) in all EU Member States. Thus AEMs are one central element of the second pillar of the Common Agricultural Policy (CAP) in the European Union.

AEMs are optional for farmers who may choose to sign a contract to carry out one or more management adaptations designed to provide environmental services. From 2000 to 2005 about 49% of the expenses of the European Agricultural Guidance and Guarantee Fund (EAGGF) went to agri-environmental measures (2.25 billion Euros) (COM, 2006). In 2002, in the 15 older Member States about 25% of the Utilised Agricultural Area was covered by agri-environmental contracts (COM, 2005). However, the systematic evaluations conducted in recent years (see COM, 2000, 2002) have shown that AEMs partly fail to achieve the desired results, and can in any case at least be improved in terms of their cost-effectiveness (e.g. Kleijn et al., 2001, 2006; Kleijn and Sutherland, 2003; COM, 2004). Furthermore, there is an increasing pressure for more cost-effectiveness because of decreasing public funds following EU enlargement. For example, for the planning period 2007–2013 Germany will spend 8.1 billion Euros for rural development measures of the second pillar (BMELV, 2006). This will be approx. 12% lower than in the last period from 2000 to 2006 in which it had been 9.2 billion Euros (Deutscher Verband für Landschaftspflege, 2006).

For improving AEMs aspects discussed under static as well as dynamic efficiency have to be considered. Statically efficient means to achieve a given amount of environmental improvement at the least possible costs or, equivalently, to produce the maximum environmental improvement possible for the resources being expended (e.g. Latacz-Lohmann, 2001). Dynamically efficient means to activate farmers to use innovation, information and motivation advantages for meeting the specific environmental goals (e.g. Ewers and Hassel, 2000) choosing an efficient way of managing on their own.

In terms of dynamic aspects of efficiency the result-oriented incentive approach (payment-by-results, performance-based or output-oriented incentives) is discussed for AEMs in literature (e.g. Gerowitt et al., 2003; Matzdorf, 2004a; Höft and Gerowitt, 2006). Result-oriented payments are directly linked to the desired environmental goals in terms of environmental goods. For example, a farmer may receive payments for a 'species-rich wet meadow'. In contrast, action-oriented payments are linked to an adapted agricultural management that is presumed to lead to the production of environmental goods. The farmer may receive payments for refrain-

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ing from manuring his meadow and for mowing it only once a year.

In the case of incentives linked to a specific environmental goal (result-oriented AEMs), farmers see environmental objectives as environmental goods—so-called 'Non-Commodity Outputs' (NCO) (OECD, 2001; Wiggering et al., 2003). Thus, farmers select the most appropriate (sensitive) areas in a decentralised way. They also enjoy greater flexibility in choosing methods for achieving the environmental objectives and their choice is determined by their individual rational decision. For these reasons, result-oriented incentives are considered to have many advantages over action-oriented remuneration: result-oriented remuneration prompts farmers to pursue environmental objectives for their own benefit, increases innovation potential, reduces information asymmetries, promotes cooperation between farmers, and improves the farmers' intrinsic motivation for, and interest in environmental objectives (Matzdorf, 2004a; Matzdorf et al., 2008).

The first examples of implemented result-oriented AEMs (roAEMs) can be found in Switzerland and in Germany. In the federal state of Baden-Wuerttemberg, Germany, a roAEM started in 2000 (Oppermann and Gujer, 2003) and in Lower Saxony, Germany, in 2007 (Wittig et al., 2007).

Aim of our paper is the provision of first empirical evidence on roAEMs. Due to the implementation of the result-oriented incentives for AEMs over the last years, we can analyse the empirical data from our investigation conducted in Baden-Wuerttemberg to underpin the theoretical discussion regarding advantages and disadvantages empirically. These advantages and disadvantages are related to private and societal costs (inclusive of transaction costs) as well as ecological benefits. The results of this analysis provided the conclusion of higher cost-effectiveness of this new approach.

The presented paper is organised in this way: in the following section we present as our analytical framework potential advantages and disadvantages of the result-oriented approach which are discussed in literature. 'Materials and methods' section describes the objectives and area as well as our methodological approach of the empirical study. In 'Results' section the potential (i) advantages 'innovation', 'continuity' and 'intrinsic motivation', and (ii) disadvantages of result-oriented incentives are described and tested using the results of our empirical investigation. Finally, we discuss in 'Discussion and conclusions' section whether the result-oriented incentive is a cost-effective instrument and which institutional framework is necessary to introduce such an approach.

Analytical framework for the cost-effectiveness analysis

The starting point for our empirical analysis is based on the advantages and disadvantages of result-oriented approaches, discussed in the literature. Advantages and disadvantages that are empirically revisable through surveys are chosen.

For our cost-effectiveness analysis we build up the relation between our selected advantages and disadvantages and potential benefits as well as private and societal costs. Costs include production costs, implementation costs and decision-making costs (Wätzold and Schwerdtner, 2004). We summarize the last two under transaction costs. Private production costs refer to the costs of the actual conservation activities that have to be performed to achieve the aim of conservation (see, e.g. Hampicke and Roth, 2000). Private transaction costs include information, negotiation, opportunity, administration, monitoring and control costs that arise before, while and after the implementation of the AEM (Van Huylenbroeck et al., 2005). We define relative societal cost as entire societal cost to meet a specific environmental target (cost per unit of benefit produced).

If our investigation of the advantages and the disadvantages can show (indirectly) a decrease in societal cost (see Fig. 1), we can logically conclude on the higher cost-effectiveness of the instrument. Both, the static as well as dynamic aspects of efficiency (see 'Introduction') are relevant in the improved situation.

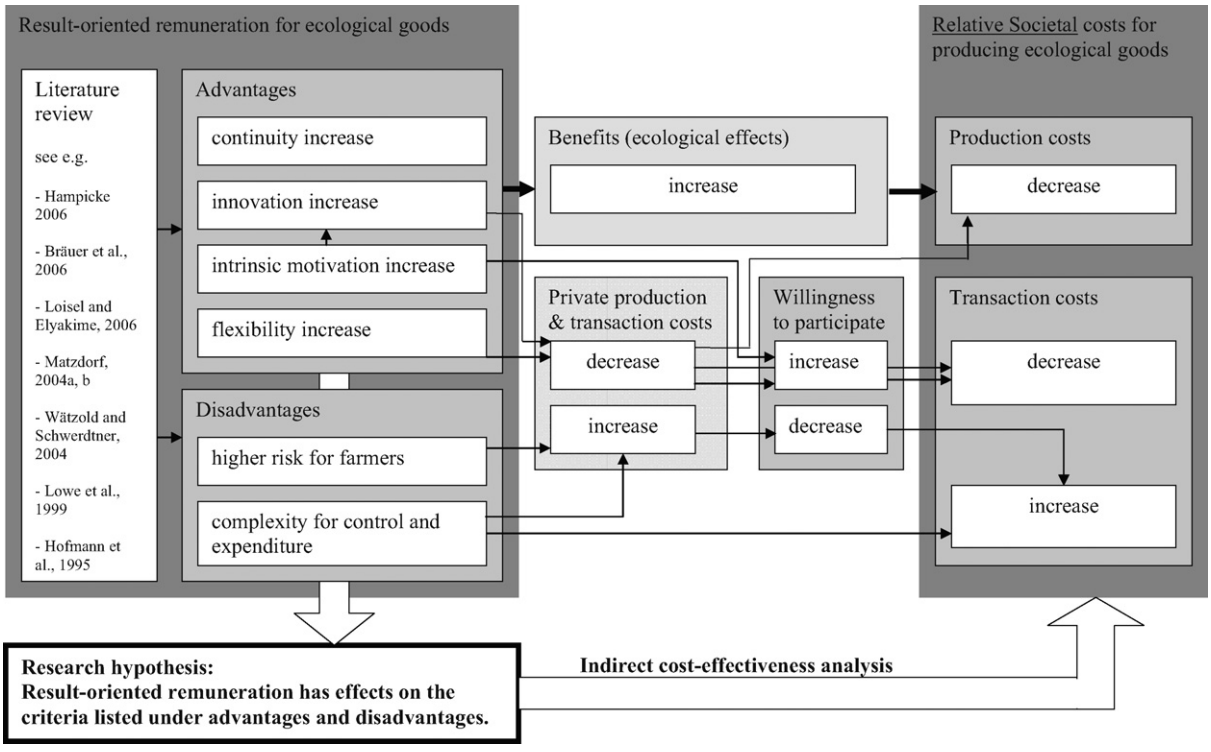

Fig. 1. Analytical framework.