

**Burton, R. J. F., & Schwarz, G. (2013). Result-oriented agri-environmental schemes in Europe and their potential for promoting behavioural change. *Land Use Policy*, 30(1), 628-641.**

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# Result-oriented agri-environmental schemes in Europe and their potential for promoting behavioural change.

## **Abstract**

Increasing interest is being shown in result-oriented agri-environmental schemes. Such schemes have the advantage of encouraging farmers to innovate to produce environmental goods – thus promoting the development of new skills and knowledge and, theoretically, ensuring that farmers are paid for provision rather than for performing management behaviours that may, or may not, lead to provision. In Europe a number of projects have trialled result-based payments over the last decade and calls for a stronger connection between agri-environmental payments and outcomes are growing. However, while the amount of information available on result-oriented schemes is increasing, there is currently no overview of the approach in the literature. This paper seeks to address this gap through a review of existing literature. It discusses why we might consider the use of result-oriented schemes, outlines two key ‘problem areas’ (the increased risk schemes represent to farmers, and the difficulties of developing and monitoring indicators), and, finally, proposes a framework for examining the strength of results orientation based on three dimensions – proportion of result-oriented payments, sensitivity of payments, and duration of schemes/payments. Although economic and ecological arguments are outlined, our

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focus in the analysis is on how the result-oriented approach is likely to institute cultural/social change, and how to optimise schemes to ensure cultural embeddedness.

Keywords: result-oriented agri-environmental schemes; European environmental policy; cultural change; farmer behaviour.

## **1. Introduction**

European agricultural policy has long relied on voluntary agri-environmental schemes as the instrument of choice to promote biodiversity, limit environmental degradation, reduce wildlife loss and preserve cultural landscapes. Voluntary approaches appeared initially in the form of a limited number of targeted schemes under Article 19 of the Farm Structures Regulations from 1987–1991 and, latterly, through the MacSharry reforms of 1992 which saw the widespread implementation of agri-environment measures (AEMs) under Council regulation 2078/92/EEC. Although schemes have come and gone in the last 20 years, the objectives of agri-environmental policy have remained largely unchanged, with the most recent Council regulation on rural development (1698/2005/EC) ensuring agri-environmental measures remain compulsory for the member states (EU Commission, 2005) and thus emphasising their continued importance in Europe.

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Equally unchanged has been the chosen reward mechanism for farmers – that of ‘action-oriented’ payments, i.e. paying farmers not for the provision of outcomes, but the delivery of land management practices. In part, this is in deference to the signatories of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT, 1994) who required that measures needed to be taken to ensure that agri-environmental payments are not trade distorting. Thus two key criteria (Annex 2, Section 12), were established, namely:

- a) “Eligibility for such payments shall be determined as part of a clearly-defined government environmental or conservation programme and be dependent on the fulfilment of specific conditions under the government programme, including conditions related to production methods or inputs”, and
- b) “The amount of payment shall be limited to the extra costs or loss of income involved in complying with the government programme.” (GATT, 1994: Page 63).

These criteria have effectively governed the nature of agri-environmental schemes since their inception, enabling the European Union (EU) to pay farmers for environmental and conservation services where these are “dependent on the fulfilment of specific conditions” (including defining methods of production and inputs) and providing compensation is limited to costs of compliance incurred. With no alterations to the Agreement over the last 15 years, action-oriented approaches have

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become the dominant means of securing environmental and conservation public goods in Europe (Groth, 2009).

By some measures, the 'action-oriented' approach has been exceptionally successful. In particular, by the end of the previous programming period in 2006, 54% of the utilized agricultural area of the EU-25 was under an agri-environment agreement (European Commission, 2009). However, while acceptance and uptake are used as indicators of effectiveness in regular EU reviews (Herzog et al., 2005) for almost a decade now concern has been expressed that this may not have been translated into other, arguably more important, scheme outcomes.

First, and fundamentally, there is the issue of the environmental benefits. While Beckmann et al. (2009) note that there are a diverse array of AEMs in place across the EU, and that the results have accordingly varied (also see Kleijn and Sutherland, 2003), many ecological examinations of action-oriented schemes have concluded that outcomes in terms of both targeted species protection and general biodiversity are often rather poor (Kleijn et al., 2001; 2004). For example, failure of action-oriented approaches has been noted with respect to the occurrence of hornworts on the Swiss Plateau (Bisang et al., 2009), butterflies and birds in Switzerland (Roth et al., 2008), farm birds in the United Kingdom (UK) (Berendse et al., 2004; Vickery et al., 2004), and biodiversity in general in Austria (Zechmeister et al., 2003; Wrška et al., 2008). Where species restoration has been successful, schemes have been targeted at

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individual species, have been very costly, and have neglected other more common but also declining species (Berendse et al., 2004).

Second, there is some concern that AEMs may not be providing value for money (e.g. Green, 2004). Landowner responses such as the 'adverse selection' of lower yielding land for entry into environmental programs (Quillérou and Fraser, 2010) and selection of options (from menu-type schemes) for ease of management rather than ecological objectives (Butler et al., 2010) suggest that currently we may not be getting the best environmental return for our investment.

Third, despite some researchers suggesting that action-oriented schemes should promote long-term attitudinal and cultural change (e.g. Lowe et al., 1999; Valentine et al., 2007), there is little evidence that they are doing so (Macdonald and Johnson, 2000; Schmitzberger *et al.*, 2005; Herzon and Mikk, 2007; Schenk *et al.*, 2007). The problem is effectively twofold. First, as Musters et al. (2001: 364) note, the practice of restricting farmers' behaviour does little to foster commitment to nature conservation. In fact, restrictions on behaviour are often viewed with resentment and/or act as a disincentive for scheme participation (Wilson and Hart, 2001; Vickery et al., 2004). Second, as Deci et al. (1999: 659) note from a review of 128 experimental studies, providing extrinsic rewards for performing behaviours generally weakens intrinsic motivations rather than strengthening them. Thus providing monetary reward for

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performing set services may not induce the attitudinal or cultural change required for the necessary long-term behavioural changes (Burton and Paragahawewa, 2011).

It can be surmised that action-oriented approaches continue to dominate agri-environmental schemes for a number of reasons: they are relatively easy to implement and monitor (no complex indicators required), are, in general, acceptable to farmers (often because they involve little actual change to farming practices – e.g. Wilson and Hart, 2001), they comply with WTO requirements, and, to put it simply, we currently lack any feasible alternative.

However, since the mid-2000s the rhetoric emerging from the European Commission has begun to change. Under pressure from the World Trade Organisation, budgetary costs from the eastward expansion of the EU, and growing public expectations of transparent agricultural subsidies (Haaren and Bathke, 2008) the EU is looking for more cost-effective means of paying for agri-environmental provision. An option being seriously considered is the implementation of result-oriented schemes. For example, an assessment of 24 national rural networks and 12 EU organisations participating in the European Network for Rural Development, demonstrated a “fairly widely held view that the tools to maintain and enhance the environment should be more clearly results oriented” (ENRD and EC, 2010: 8). A November 2010 communication [COM(2010) 672] on future challenges in the food, natural resource and territorial areas pushed further in this direction in observing the “paramount

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importance” of developing new, more cost-effective, delivery mechanisms for environmental goods and noting that a more outcome-based approach “would best steer the policy towards EU priorities and show what it actually achieves” (ENRD and EU 2010: 11).

To some extent this represents the increasing ideological intrusion of neoliberalism into European Union policy (e.g. Potter and Tilzey, 2005) with politicians contending that competitive market-mechanisms are the best way of delivering outcomes (including environmental outcomes) from strained European budgets<sup>1</sup>. Yet, it is also a recognition of the failure of action-oriented schemes to deliver as promised and of the consequent need to seek alternative approaches for providing environmental public goods.

Simultaneous to these developments have been the first tentative steps towards result-oriented schemes in the European Union. Besides the implementation of a roAEM in the MEKA program in Baden-Württemberg in Germany and the addition of result-oriented elements such as bonus payments to action-based measures, much of this experimentation has been funded through regional programs and, as a consequence, these schemes have not received the same level of EU funding (or assessment) as the

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<sup>1</sup> Following the financial crisis of the late 2000s there has been some debate concerning the weakening of the neoliberal project. However, despite its key role in the unravelling of economic stability in Europe, it is widely considered too early to declare neoliberalism ‘dead’ (Castree, 2009; Peck et al., 2009) and, in fact, the requirements of lenders on the economies of Greece suggest a tightening, rather than loosening of market principals.

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EU co-funded action-oriented programs. Nevertheless, in some parts of Europe experimentation with result-oriented payments has been applied: in particular, in the Netherlands (Verhulst et al., 2007; Musters et al., 2001) and some of the German Länder (States) where experimentation has been relatively extensive (e.g. Matzdorf et al., 2010; Wittig et al., 2006; Oppermann and Briemle, 2002) and has demonstrated that a level of results-orientation can be achieved within the existing policy framework. Given the ecological, economic and social failings of existing policy, combined with the liberalising political agenda within Europe, we contend that it is time to assess these schemes for their potential to improve the delivery of environmental public goods.

We are not proposing to outline a 'methodology' for constructing result-oriented schemes. Within the literature there already exist accounts of how to develop key programs – in particular, the application of indicator-based result-oriented approaches to promote species-rich meadows has been thoroughly detailed (Matzdorf et al., 2008; Kaiser et al., 2010; Klimek et al., 2008; SNH, 2005, Buckingham et al., 1998) as have, to a lesser extent, animal species preservation programs (Musters et al., 2001; Zabel and Holm Müller, 2008). The economics of results oriented approaches have similarly been well discussed (e.g. Braeuer et al., 2005, Matzdorf and Lorenz, 2010; Hampicke, 2006; Groth, 2009; Zabel and Roe, 2009) and some researchers have begun to consider how result-orientation is likely to influence the extent to which



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scheme objectives become culturally embedded (e.g. Burton et al., 2008; Burton and Paragahawewa, 2011). However, what is lacking is an overview.

In this paper we first present a brief description of European result-oriented agri-environmental schemes. Second, we review the ecological, economic and social (in terms of scheme uptake and cultural embeddedness) outcomes emerging from these schemes. Third, we discuss two key problems with result-oriented approaches – increasing risk for farmers and the need to develop effective indicators. Finally, we present a framework for classifying the strength of the result-orientation based on three dimensions - proportion of result-oriented payments, sensitivity of payments, and duration of schemes/payments.

## **2 Result-oriented AESs in Europe**

What exactly are result-oriented agri-environmental schemes? Within the literature a number of different reference terms are employed. These include: “payment-by-results” (Schwarz et al., 2008; Klimek et al., 2008; Groth, 2009), “outcome-based/oriented” (e.g. Latacz-Lohmann, 2000; Schilizzi et al., 2010; Höft et al., 2010; Siebert, 2010), “result-oriented” (Gerowitt et al., 2003; Oppermann, 2003; Osterburg and Nietsch, 2004; Höft and Gerowitt, 2006; Matzdorf et al., 2008; Kaiser et al., 2010; Matzdorf and Lorenz, 2010), “success-oriented” (Haaren and Bathke, 2008), “objective-driven” (Burger, 2006), and “performance payment” based (Zabel and

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Holm-Müller, 2008; Zabel and Roe, 2009). Despite the unnecessarily varied nomenclature, all refer to the same concept: agri-environmental schemes that pay land managers, not for performing specific management actions (such as mowing on set dates or restricting fertilizer use to set limits), but for achieving set environmental outcomes (such as particular species mixes or the promotion of an endangered species). An additional commonality is that such schemes permit the landowner to innovate, thus, theoretically at least, drawing on their experience and local knowledge to achieve better and more cost-effective results.

The potential of result-oriented schemes is generating increased interest in Europe. Within Germany where experimentation with result-oriented approaches has been underway for almost a decade, the focus has been on the preservation of species-rich meadows with schemes operating in Baden-Württemberg (Oppermann and Briemle, 2002) and Lower Saxony (Wittig et al., 2006; Zabel and Roe, 2009) – and a scheme under investigation in Brandenburg (Matzdorf et al., 2010; Kaiser et al., 2010). Early examples were also implemented in the UK (conservation of hay meadow and pasture plants species in the Peak District National Park (Buckingham et al., 1998)) and Switzerland (support for ecological quality of meadows and establishing ecologically valuable networks of meadows (Oppermann and Gujer, 2003)).

Other schemes, however, focus on the preservation of key animal species. For example, Zabel and Holm-Müller (2008) detail a Swedish result-oriented scheme to

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encourage the reproduction of large carnivores (lynx and wolverines) on reindeer grazing lands. In the Netherlands similar result-oriented approaches have been targeted at improving the breeding success of meadow-bird species. For example, Musters et al. (2001) conducted a trial on using per-clutch payments to preserve nesting Lapwings and Black-tailed godwits, and Verhulst et al. (2007) similarly studied the use of per-clutch payments to enhance wader breeding success within Dutch agricultural cooperatives. A scheme in Schleswig-Holstein paid farmers for the conservation of four endangered bird species, differentiating between single breeding pairs and entire colonies (Stapelholmer Naturschutzvereine, 2007).

Table 1 provides an overview of result-oriented agri-environment schemes in Europe based on a review conducted by Schwarz et al. (2008). The examples also include action-based schemes with outcome-based elements such as bonus payments (e.g. the Higher Level Stewardship Scheme in England).

*Table 1: Overview of European result-oriented examples of AEMs (source – adapted from Schwarz et al., 2008).*

Most of the past and current examples of result-oriented schemes have or had a prototype character implemented at a local level with a limited number of farms taking part. The objectives and environmental targeting of the examples concentrate on biodiversity conservation with a particular focus on grassland habitats and plant

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species coupled with a few examples focussing on specific animal species. Schemes addressing wider environmental issues such as diffuse pollution or carbon sequestration are referred to in the literature (Mayrand and Paquin, 2004), but relatively few are well-established world-wide or can be seen as strongly result-oriented. The focus of the European examples on site-specific single objective schemes reflects the complex nature of implementing catchment or landscape scale and multi-objective schemes, e.g. with respect to monitoring and coordinating the delivery of results across sites and farms (Schwarz et al., 2008).

### **3 Ecological, economic and social outcomes of a result-oriented approach**

Despite their limited number, experimental agri-environmental programs in Europe are beginning to reveal the outcomes that might emerge in terms of ecological, economic, and social/cultural changes. While in this section we refer to actual schemes as much as possible, limited experience with result-oriented schemes means that some of the work remains either theoretical or based on researchers' first impressions, rather than being underlain by comprehensive empirical evidence. Thus the section is a synthesis of theorised outcomes and supporting or contradicting evidence.

#### **3.1 Benefits of result-oriented schemes**

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### *3.1.1 Ecological outcomes*

Amongst researchers in this field there is a general belief that result-oriented approaches will be able to deliver better ecological outcomes than action-oriented approaches. A number of reasons are given. First, where farmers are permitted to innovate in environmental provision, they are able to incorporate existing knowledge that is more “context specific, heterogeneous and subtle” (Swagemakers et al., 2009: 191) and which theoretically should improve the efficiency of production (Klimek et al., 2008; Zabel and Roe, 2009). Although farmers’ understanding of wildlife production will initially be limited, over time they should be able to utilise the same skills developed for conventional production (environmental management) in the pursuit of environmental production.

Second, removing managerial restrictions and regulations is thought likely to increase the uptake of any scheme (e.g. Wittig et al., 2006; Klimek et al., 2008). While it is difficult to attribute causality, the initial uptake rates of result-oriented approaches have been very positive suggesting, at the very least, the schemes are as attractive as action oriented approaches despite the increased risks (e.g. Matzdorf and Lorenz, 2010).

Third, when farmers are paid according to outcomes, there is an incentive to use land for production that will produce the best environmental results (Matzdorf et al., 2008)

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– negating the ‘adverse selection’ effect (see Quillérou and Fraser., 2010). This incentivises farmers to develop the type of whole-farm approach to environmental provision that researchers have suggested is likely to deliver critical environmental benefits (e.g. Mander et al., 1999; Butler et al., 2007). For example, Butler et al. (2010: 355) observe that while the weight of management options for Entry Level Stewardship in the UK is towards resource delivery in ecologically vital cropped areas, most land owners, given the choice, select options involving management of farm margins and hedgerows. As a result, the authors contend farmland bird species are likely to continue to decline. If this scheme was result-oriented (on the basis of breeding success) and the decline continued, this management choice would not result in payment.

The final way in which result-oriented schemes can contribute to improved ecological outcomes is through their ability to reach more specific goals. While it is feasible to imagine roAEM’s being used to target a wide range of biodiversity objectives, focusing on a biodiversity goal which is more closely influenced by the condition and management of an individual site establishes a closer link between the (justification of the) payment and the achieved outcome. Attaching payments to outcomes, enables the purchaser to target precise conservation goals, thus providing them with an improved ability to control the ecological effectiveness of the scheme (Klimek et al., 2008; Zabel and Holm-Müller, 2008). In addition, targeting species in this manner may lead to improved efficacy of the payment system as compensation is only paid for results

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achieved, thus avoiding payment for non-delivery. However, management solely for an individual plant or animal species can be complex and prone to influences outwith the control of the target site manager. Hence setting the required outcome in terms of the desired characteristics of a particular habitat or plant species assemblage (and allowing for a range of variations within those characteristics) appears potentially easier to implement in practice (Klimek et al., 2008; Schwarz et al, 2008; Zabel and Roe, 2009).

Ecological results of the early European result-oriented schemes have been positive, although the impact of the result-oriented component is often difficult to distinguish from action oriented results. None of the reviewed studies suggested that the result-oriented approach failed, and farmer response to the approach was seen as overwhelmingly positive across the studies. In cases such as the pay-by-clutch meadowbirds approach in the Netherlands, even though the results for the scheme have not been exceptionally positive, they have at least been better than the results obtained from establishing fixed mowing dates (Verhulst et al., 2007). In general, however, the short running time of many of the programs and the fact that they are underlain by an entrenched system of action-oriented payments means that it is difficult to assess the ecological impact of existing result-oriented schemes.

### *3.1.2 Economic outcomes*

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The key economic advantage of result-oriented schemes comes from the reduction in costs achieved by directly linking payments to outcomes (e.g. Musters et al., 2001; Dreschler et al., 2007; Schilizzi et al., 2010; Höft et al., 2010). In part, this is due to the reduction in information asymmetries. Under the fixed-price based action-oriented approach, the purchaser (the government) has no idea of the actual costs of production and may consequently pay for goods not produced (Matzdorf and Lorenz, 2010). This problem can also be resolved through competitive auctions in association with result-oriented schemes – allocating contracts to those that provide the highest benefits for the lowest cost (e.g. Claassen et al., 2008; Groth, 2009) - an approach currently used in international programs such as the Victorian Bush Tender Trial (Cocklin et al., 2007) and the Conservation Reserve Program in the US (Claassen et al., 2008).

The potential of auctions to improve the cost-efficiency can, however, be limited in practice due to strategic behaviour of farmers. Farmers learn from their previous experience with auctions and adapt their behaviour in subsequent cases, thus reducing the cost-saving potential of this approach (Hailu and Schilizzi, 2004). While such problems were reported in both the Victoria Bush Tender Trail and the Conservation Reserve Program, empirical evidence suggests that the bidding process still substantially improves the cost-efficiency compared to fixed-price schemes (Claassen et al., 2008; Stoneham et al., 2003; White and Burton, 2005; Latacz-Lohmann and Schilizzi, 2007, 2011). However, while auctioning is permitted in Europe under



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Council Regulation (EC) No 1698/2005, the use of auctions in EU agri-environmental programs is as yet “not in sight” (Groth, 2009).

Some European schemes have illustrated cost reduction directly. For example, Musters et al. (2001) showed that paying farmers in the Netherlands per clutch payments for preserving meadowbirds was more cost-effective than paying them to manage the environment. Further, Matzdorf and Lorenz (2010) – in what they describe as the “first empirical evidence” on the cost-effectiveness of result-oriented schemes – conclude that the result-oriented schemes in Baden-Wuerttemberg aimed at preserving species rich grassland also had a positive effect. Finally, Groth (2009) estimated a potential for 21% to 36% cost effectiveness gains for the Northeim project in Lower Saxony. Despite these successes, the cost reduction value of result-oriented schemes remains largely theoretical. As Schwarz et al. (2008) observe, the prototype schemes currently in existence have relatively high administration and transaction costs for establishing and monitoring as scheme implementation and operation cannot build on previous experience, and schemes often lack economies of scale (e.g. Northeim Project, 28 farmers – Richter gen. Kemmermann et al., 2005; Fuhrberg project, 10 to 17 farmers – Haaren and Bathke, 2008).

### *3.1.3 Social/cultural change outcomes*

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As observed in the introduction, one of the key problems with action-oriented schemes is their failure to promote long-term behavioural change. In contrast, there are a number of characteristics of result-oriented schemes that, we contend, make them more likely to induce positive changes.

First, result-oriented approaches change the social relationships within rural communities and between rural communities and other stakeholders. By making knowledge of how to improve conservation on farms important, result-oriented schemes create common goals between farmers and conservationists, leading to cooperation between two conflicting groups (Musters et al., 2001; Matzdorf and Lorenz, 2010). Increasing cooperation between stakeholders in this manner is likely to result in ecological improvements as well as the infusion of previously incompatible values into agricultural production.

Change may also occur in the relationship between farmers and the public. In particular, result-oriented schemes can communicate the extent to which farmers contribute environmental services to society and, consequently, help to justify financial support to the farming community<sup>2</sup> (Matzdorf and Lorenz, 2010). By assuming the responsibility for management practices, credit for providing an attractive and biodiverse landscape may be attributed to the land manager rather than

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<sup>2</sup> Höft et al. (2010) refer to this as building up “environmental reputation capital.”

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being perceived as a regulated management requirement of the government (Burton et al., 2008).

Second, rather than restricting farmers' behaviour or providing rewards for what are effectively externalities to the production process, result-oriented schemes treat environmental goods as a 'product' comparable with other commodities produced on the farm (Klimek et al., 2008; Matzdorf et al., 2008; Matzdorf and Lorenz, 2010; Höft et al., 2010). Thus rather than sitting 'outside' of the farm in a symbolic sense (see Burton et al., 2008), the production of ecological goods becomes part of the focus of farm objectives and the farmer may turn his/her attention towards issues of ecological management (Matzdorf et al., 2008). This may have contributed to an observed increase in farmers' interest in nature as a result of engagement with result-oriented schemes (Richter gen. Kemmerman et al., 2006; Haaren and Bathke, 2008; Matzdorf and Lorenz, 2010).

Finally, it has been argued that result-oriented approaches can contribute to the development of non-economic forms of capital (cultural, symbolic and social<sup>3</sup>) on the farm and, hence, to environmental public goods provision becoming embedded within conceptions of 'good farming' (Burton et al., 2008; Burton and Paragahawewa, 2011).

Action-oriented schemes fail in this respect because (a) symbols of good conservation

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<sup>3</sup> According to Bourdieu (1986) cultural capital consists of resources in the form of knowledge, skills, dispositions and the possession of culturally significant objects. Symbolic capital is the prestige attributed for possessing cultural capital – e.g. community recognition as a 'good farmer'. Social capital, on the other hand, can be measured as the access to group resources provided by being accepted within a social group (see Burton and Paragahawewa, 2011, for further details).

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work are largely invisible to other farmers, and (b) by prescribing fixed management regimes, the government removes the farmer's ability to innovate and thus to display their farming skills and knowledge (Burton et al., 2008). As a result, farmers in their action-oriented conservation roles often perceive themselves as little more than 'glorified park-keepers' (Midmore et al., 2001), and the prescribed nature of the activities renders conservation work neither of particular interest nor of any social value.

In contrast, farmers participating in conventional production have "visible, measurable and comparable results within short periods as a direct feedback of farmers' work" (Lütz and Bastion, 2002: 167) and are able to innovate to improve their economic outcomes. Result-oriented schemes operate similarly. As Rogers (1983: 215) notes, "even though every innovation is judged on economic grounds to a certain degree (by its potential adopters), every innovation also has some degree of status conferral" (also see Wilson 1997; Burton et al., 2008). In allowing innovation, therefore, result-oriented schemes also enable the development of status and prestige (symbolic capital) in environmental provision which, in turn, can be employed for "establishing or reproducing social relationships that are directly usable in the short or long-term", i.e. building social capital (Bourdieu, 1986: 52). Thus, a direct 'market' for knowledge and skills is established, with the farmer earning reciprocal access to resources (e.g. labour, machinery, credit) via the social capital generated (Burton, 2012).

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The importance of social capital for the success of agri-environmental programs has been noted by a number of researchers (e.g. Musters et al., 2001; Jackson et al., 2007; Dobbs and Pretty, 2008; Jones et al., 2009). Social capital is both critical in collective management projects as it “lowers the cost of monitoring behaviour and inducing rule compliance” (Dietz et al., 2003:1908 – also see Dobbs and Pretty, 2008) and important for individual management approaches as higher levels of social capital minimise transaction costs and dense social networks may facilitate awareness and increase scheme participation (Jones et al., 2009). However, farm-based social capital does not necessarily always work in the desired direction (Sutherland and Burton, 2011). If a social network were constructed around intensive productivist agriculture, the social capital may operate against more extensive land uses as farmers in the group place pressure on others to maintain productivist activities. The advantage of building social capital through result-oriented schemes (via cultural capital) is that it is likely to establish networks based on environmental symbolic capital rather than productivist symbolic capital.

#### **4. Stumbling blocks – potential problems with result-oriented provision.**

Despite the potential environmental, economic and social benefits of result-oriented schemes, the literature also suggests two key areas of concern with the approach,

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namely; the increase in the risks associated with result-oriented programs and the implications this has for the ability of schemes to attract and hold participants (e.g. Zable and Roe, 2009; Sattler and Nagel, 2010) and the difficulty of developing suitable indicators of success (e.g. Matzdorf et al., 2008; Kaiser et al., 2010).

#### *4.1. Increasing risk for suppliers*

Result-oriented programs increase risk to farmers in a number of areas. First, the outcome of farmers' actions is dependent on factors outside their control – in particular, climatic conditions (Westerlink et al., 2008; Latacz-Lohmann and Schilizzi, 2005), the behaviour of neighbouring farmers (e.g. providing a seed source for decolonisation – Aviron et al., 2010), and, for mobile species, life-cycle stages such as breeding, feeding, and migrating (Westerlink et al., 2008). Consequently, while action-oriented agri-environmental schemes may be regarded as a steady source of income to support the farm, result-oriented approaches offer no such security. This additional risk led Westerlink et al (2008: 25) to question the fairness of result-oriented schemes asking “whether it is fair to hold a farmer responsible for the outcome of his measures, while he is greatly depending on natural processes and the surrounding environment, including the behaviour of his neighbours.”

Second, where programs rely on a limited number of thresholds (or only one) to determine payment there is a risk that farmers ‘oversupply’ at their own cost if they

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exceed production targets (Gerowitt et al., 2003). This problem diminishes as the payment mechanisms become more sensitive in strongly result-oriented schemes (see Section 5) as any additional value generated is likely to be compensated.

Third, some researchers have noted that engaging as a provider of public goods opens the farm up to closer public scrutiny. As the farmer is now selling a public good, access to information about the farm must be made available, increasing the risk of public disclosure of incriminating information about farm management practices (Haaren and Bathke, 2008; Atari et al., 2009).

Despite concern for additional risks, arguments can also be made that result-oriented schemes reduce risks in certain areas. In particular, schemes that prescribe specific management activities have their own risks attached. For example, setting fixed management dates (such as mowing dates – Riley, 2006; Swagemakers et al., 2009) restricts a farmer's ability to respond to weather events, and placing long-term restrictions on land use change (e.g. woodland planting schemes) limits farmers' options for responding to market forces. In contrast, result-oriented schemes mitigate these risks by allowing farmers the flexibility to decide whether the potential loss of income from the environmental payment is worth the potential income gained from, for example, mowing early or removing the trees before they are due to be harvested.

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Some evidence suggests that farmers in result-oriented schemes desire this flexibility.

In Matzdorf and Lorenz's (2010) study of MEKA farmers, a third stated they would prefer an exclusively result-oriented scheme (without even the current base payment) in order to retain flexibility – while only 7% preferred rigid conditions and a secure premium. They also found that of the 27% that had failed to meet the required number of indicator species, only 13% were affected by factors beyond their control and only a total of 5% were deterred from the project by the risk of a negative outcome. From this the authors contend that “results show that a potential risk does not have a clear negative impact on the willingness to participate” (Matzdorf and Lorenz, 2010: 542).

In addition, diversifying into environmental public goods as a form of production can reduce overall risk. Klimek et al. (2008) report from their study of the Northeim Project that an appropriately designed result-oriented payment scheme can help farmers diversify their total income risk by the production of verifiable ecological goods. Environmental goods may be of particular value because weather and commodity price variations that influence crop production will not necessarily have the same impact on environmental goods. Consequently, while the income is not as certain as in action-oriented provision, result-oriented programs can mitigate the economic impact of conventional crop failure (Stoneham et al., 2003; Klimek et al., 2008).



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However, leaving aside the issue of whether risk is increased or not, it is our contention that we need to think of 'risk' differently in result-oriented schemes. There are two reasons for this. First, unlike in action-oriented schemes where risk is relatively constant, the risk associated with result-oriented payments declines with increased experience as farmers learn more about the production function, develop new skills, expand their knowledge, and forge new social capital with others. In the existing EU schemes, researchers have noted farmers improve their skills over the duration of the scheme (e.g. Baumgärtner and Hartmann, 2001; Wittig et al., 2006) and form new social connections between conservationists/ecologists (Musters et al., 2001), other farmers (Verhulst et al., 2007) and the purchasing organisations (Zabel and Roe, 2009).

Second, result-oriented schemes may provide farmers with non-economic forms of capital by allowing them to personally overcome risk. For example, in Burgess et al.'s (2000: 126) study on the Pevensy Levels (UK) the authors found that farmers saw themselves as "ingenious, inventive and independent individuals capable of surviving the ups and downs of a boom-and-bust agricultural economy ... being able to overcome the adversities of unpredictable nature" and noted that this ability to overcome adversity had become an important part of their local identity. Similarly, Sligo & Massey (2007) observe that the feeling of shared adversity farmers experience in conditions of risk increase both the activity in social networks and levels of social capital generated. Eliminating risk of product failure therefore reduces

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the potential for ideas and practices becoming culturally embedded in notions of “good farming”.

Despite the need for an element of risk, it is clearly undesirable that result-oriented schemes should be highly risky endeavours for farmers. Researchers have suggested a number of means of reducing the risk including offering a base payment to compensate for actions, and a bonus payment for outcomes (Bräuer et al., 2006) – a measure that Schlizzi et al. (2010) note is particularly effective when dealing with risk-averse landowners; making remuneration dependent on a combination of the agent's actions and a weather variable (Loisel and Elyakime, 2006); allowing farmers to undergo subsequent checks to avoid sanctions after extreme weather events (as is currently the case for the MEKA project – Matzdorf and Lorenz, 2010); and the careful choice of (multiple) performance indicators that spread the risk that any particular species will fail in one year (Zabel and Roe, 2009).

#### *4.2. Developing effective indicators of achievement*

An issue that receives considerable attention in the literature is the need for effective indicators of scheme success (Bertke et al., 2008, Matzdorf et al., 2008; Kaiser et al., 2010). In some cases indicators may be relatively simple. For example, where schemes promote breeding success in large carnivores (e.g. OECD, 2010) or easily recognisable bird species (e.g. Stapelholmer Naturschutzvereine, 2007) the indicators

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can be singular (presence/absence) and are likely to be easily recognisable to farmers. However, the majority of existing result-oriented programs in Europe are aimed at promoting the development of biodiversity such as increasing species occurrence in arable farm land or promoting species-rich meadows (Schwarz et al., 2008). As measures of biodiversity are complex and may vary over relatively short distances, it is critical to find indicators that represent the desired outcomes.

A number of papers – both theoretical and empirical – already exist on the practice of selecting indicators for result-oriented schemes (e.g. Wittig et al., 2006; Matzdorf et al., 2008; Zabel and Roe, 2009; Höft et al., 2010) thus, rather than recounting their methods, we collate information from across a wider range of studies on the characteristics of ‘good’ indicators. Requirements for indicators fall into four main groups:

- 1) **Indicators should be measurable and identifiable.** Measurability and identifiability are critical requirements for selecting indicator species. Measurability is necessary to promote ease of monitoring (e.g. Gerowitt et al., 2003; Höft and Gerowitt, 2006; Matzdorf et al., 2008; Zabel and Roe, 2009) and should, according to Matzdorf et al. (2008) be comparable over the contract period. Species should be easily identified as, in the majority of result-oriented schemes, farmers have a role in monitoring their levels of provision (e.g. Gerowitt et al., 2003; Wittig et al., 2006; Matzdorf et al., 2008;

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Zabel and Roe, 2009). To make this easier, it is beneficial if the species' appearance is consistent throughout the year (Höft and Gerowitt, 2006).

- 2) **Indicators should not conflict with agricultural goals.** To be acceptable to farmers and fit in with conventional farming systems it is beneficial if indicator species do not damage conventional agricultural production (Kaiser et al., 2010) and, particularly where the species are considered 'weed species', they are easy to reduce if required (Höft and Gerowitt, 2006).
- 3) **Indicators should be consistent with ecological goals.** Indicators should be consistent with the ecological goals of the project as far as is possible (Kaiser et al., 2010). For example, indicator species known to host beneficial insects should be selected above those that, while representative of the desired habitat, do not play an important ecological role (Höft and Gerowitt, 2006).
- 4) **Indicators should reflect the effort of participating farmers.** As with crops, some indicators are likely to be more difficult to propagate than others. Thus indicators (and payments for indicators) need to reflect the management effort required for production (Zabel and Roe, 2009; Kaiser et al., 2010). An additional factor noted by some, is that indicators need to be attributable to a single producer (Gerowitt et al., 2003). However, as we outline below, there

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are potential benefits to employing indicators that cross geographical boundaries.

Where the objective of the scheme is the promotion of biodiversity, multiple indicators are required in order to reflect the diversity of habitats within the project areas. These indicator lists have specific requirements of their own. In particular, a balance needs to be struck between minimising the number of indicators on the list in order to minimise scheme complexity (Wittig et al., 2008) and having sufficient indicators to represent the biodiversity objectives (Zabel and Roe, 2009). To reflect biodiversity objectives it has been suggested that indicator lists should contain a number of species groups (Roth et al., 2008). In addition, because of spatial variations in habitats across a scheme area, indicator lists should be spatially comparable for any given agricultural unit (Matzdorf et al., 2008) and represent the variety of habitats in the program area (Wittig et al., 2006; Haaren and Bathke, 2008).

A common approach taken to reduce the expense of monitoring indicators on individual farms is self-monitoring. Although identification of species can be difficult, studies suggest that farmers are capable of performing this role. Klimek et al. (2008: 2894), for example, observe that on-the-spot inspections “revealed that farmers were able to conduct floristic inventories by themselves and to rank their grassland sites according to the quality-levels of ecological goods.” Similarly, Wittig et al. (2006)

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note that, following an education program, farmers' identification of species was reliable with very few misidentifications observed. This process can be facilitated by the removal of species that are hard to identify from indicator lists (as noted above) and the provision of training in identification as part of the project (Wittig et al., 2006; Haaren and Bathke, 2008; Klimek et al., 2008). Encouraging farmers to conduct their own monitoring has the added bonus of increasing the social value of expertise in identification and boosting the opportunity for the development of new cultural, symbolic and social capital.

An additional area that may contribute to the establishment of a more pro-environment farming culture is the use of mobile indicator species. Conventionally, mobile indicators are considered to be problematic as they contravene one of the key requirements for effective indicators – the need to be clearly attributable to specific management actions (Gerowitt et al., 2003; Zabel and Roe, 2009). Rather, mobile indicators disperse from favourable habitats into the surrounding farmland where farmers may not have put the same effort into environmental goods provision (Roth et al., 2008), thus effectively rewarding farmers for their neighbours actions, promoting free-riding behaviour, and introducing not inconsiderable difficulties in coordinating and rewarding participants (Zabel and Roe, 2009).

However, there are also some advantages to using mobile indicators. In particular, where attribution to individuals is difficult (particularly when species require different

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habitats for different parts of the life-cycle), effective provision is likely to require farmers to coordinate their environmental goods delivery – consequently encouraging environmentally oriented social capital development between participating farmers. Further, where species are able to cross farm boundaries the status of conservation areas on farms is likely to change from a potential source of pests and disease for neighbouring farms (Mather and Thompson, 1995) to a potential source of income. As a result, the social pressure that is currently widely directed against agri-environmental provision is likely to lessen or potentially even reverse (Burton et al., 2008).

The issue of free-riding may also be addressed in the long-term by social and cultural changes. If, as Bourdieu (1986) argues, we need to take a wider view of capital, the advantages of gaining economic capital through free-riding behaviour are likely to be diminished by potential losses in social capital (i.e. the loss of access to shared resources). A study by Marshall (2004) on self-monitoring of conservation activities by farmers in Australia suggests that while initially farmers are reluctant to apply sanctions to each other, this changes once farmers feel they have met their management responsibilities while others are not meeting theirs. In effect, by creating a 'commons' of mobile indicators result-oriented schemes can employ the same community self-monitoring and compliance mechanisms that Ostrom (2000, 2009) believes makes commons management agreements more effective than even regulatory approaches.

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This discussion emphasises the need for clear definitions of desired outcomes including qualitative and quantitative baseline and threshold or performance indicators. It is, however, important that an individual cannot influence the value of the baseline of the indicators if the monitoring differentiates between different performance levels. Otherwise the indicators may provide incentives for land managers to lower the baseline just before entering the scheme or by sabotaging other's work (Lazear, 1989). Ultimately, the ecological/economic success or failure of schemes will rest on the quality of the indicators employed. Consequently, if it is not possible to develop relatively simple, self-monitorable, indicators as may be the case in some instances, the result-oriented remuneration approach may not be an appropriate means of achieving desired outcomes (Haaren and Bathke, 2008).

## **5. A framework for result-oriented schemes**

The above analysis has examined our emerging understanding of result-oriented approaches in Europe. As the ultimate aim of these schemes is to improve the efficacy of environmental payments by changing participant's behaviour, the analysis has maintained a focus on the social/cultural changes that such schemes might precipitate. At the centre of this change is the structure of the incentivisation payments to farmers. Although, thus far, we have referred to the influence of 'result-oriented' payments, it



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would be incorrect to characterise all schemes as equally result-based. Rather, considerable variation exists in the extent to which incentives are based on outcomes, incentives differentiate between different qualities and quantities of outcomes and the extent to which farmers are able to innovate within the schemes.

From reviewing the literature, we identified three key dimensions along which schemes can differ, namely:

- 1) The proportion of income derived from outcomes
- 2) The sensitivity of the payment structures
- 3) The temporal extent of the contracts and schemes

In the following analysis we discuss how each of these dimensions can vary individually along a spectrum from 'weakly result-oriented' to 'strongly result-oriented' and contend that, as any of these factors can weaken/strengthen the overall result-orientation of the scheme, one of the key objectives in experimenting with scheme design should be to get the balance correct.

### *5.1 The proportion of income derived from outcomes*

Although current 'result-oriented' schemes rely on their outcome-based payments to incentivise provision, for the majority of farmers action-based payments continue to

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exist. The proportion of these payments relative to the outcome-based payments thus clearly has an impact on whether the effect can be described as 'strong' or 'weak'.

Within Europe the strongest form is currently found in the Swedish program for carnivore conservation (currently thought to be the only large-scale performance payment scheme for carnivore conservation in Europe - Zabel et al., 2011) as, in this program, reindeer herders receive no base payments but are remunerated solely on the basis of the number of (certified) carnivore offspring within their reindeer herding grounds (Zabel and Roe, 2008; Zabel et al., 2011). In this case herders are incentivised both to innovate in provision, and to ensure that others do not harm the income earning potential of the carnivores (e.g. through poaching).

While the Dutch meadowbird scheme described by Verhulst et al. (2007) also pays on the basis of breeding success, its result-orientation is weakened by the introduction of specified management requirements once the breeding pairs have been identified – thus limiting the potential for innovation. This represents a weaker type of result-orientation, where the farmer is able to innovate to reach an entry standard but, having joined the scheme, he/she is once again constrained by prescribed management requirements. In a UK example, indicators of success are required to receive Higher Level Stewardship payments – but once farmers are entered in the scheme the management regimes themselves are stipulated by Natural England advisors (Natural England, 2010).

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The result-orientation of a scheme can also be weakened if result-based payments are underlain by action-oriented payments. This may be through incorporating base-payments into the scheme to encourage participation, but, alternatively, it may result from schemes being independently underlain by existing agri-environmental payments. For example, Swiss agri-environmental provision consists of three components: cross compliance in order to qualify for area-related production subsidies, direct payments for specific voluntary environmental activities, and, since 2002, bonus payments granted for meeting minimum ecological quality standards or joining with other farmers to link biotopes (Herzog et al., 2005). The bonus payments can thus constitute a result-based payment. However, as environmental provision is already being compensated for in two other payment tiers, the incentive to achieve bonus payments may be lessened. On the other hand, however, this weaker form of result-orientation may have the advantage of enticing more risk-averse farmers to engage in the production of environmental goods while simultaneously providing an incentive for doing more than simply the minimum required (Schwarz et al., 2008). Further, schemes that do not provide underlying base-payments risk losing participants if the incentive payment falls below farmers' perceived participation costs (Zabel and Roe, 2009).

## 5.2 *The sensitivity of payment structures*

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The strength of the results orientation can also be influenced by the sensitivity of the payment structure to the addition (or loss) of environmental public goods. A close relationship between production and payment is likely to provide a stronger incentive for maintaining and enhancing environmental goods production than when threshold measurements are relatively insensitive to improvements (or losses). Currently payments in most outcome-based biodiversity projects are triggered by reaching outcome thresholds (generally a set number of target species)<sup>4</sup>. For example, in the MEKA scheme in Baden-Württemberg farmers receive payments if they can demonstrate the existence of at least 4 of a list of 28 indicator species on their meadows (Matzdorf and Lorenz, 2010)<sup>5</sup>. However, as Zabel and Roe (2009) point out of MEKA, once farmers reach this threshold, there is little incentive for further improvement – having all 28 indicator species present would not trigger higher levels of payment than having only 4 present.

In contrast, payments in the Northeim project in Lower-Saxony have been stratified into three tiers. To meet quality level 1 respondents are simply required to have at least eight forb species per each 12.6 square metre inspection plot (out of 40 possible indicator species). Quality level 2 requires at least eight forb species plus an additional two indicator species. Quality level 3 requires the baseline eight forb species, plus at least two species indicating rare grassland communities per inspection

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<sup>4</sup> The development of effective thresholds is a critical element of result-oriented scheme success (Zabel and Roe, 2009)

<sup>5</sup> Note that a minimum number of 4 indicator species is an administrative requirement determined by the federal government for all German result-oriented schemes (Wittig et al., 2006).

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plot (Richter gen. Kemmerman, 2006; Klimek et al., 2008). A similar approach was used in the Farm Conservation Scheme where three different meadow qualities were remunerated with different payment levels according to an assessment of appropriate botanical grassland composition (Buckingham et al., 1998).

While setting multiple thresholds for payment levels provides incentives for continued improvements in provision, it can simultaneously increase the complexity of the scheme. As part of the experimental program in Lower-Saxony, Groth (2009) observes that the Steinburg project (Blühendes Steinburg) was developed, in part, to explore the potential for reducing the complexity of the Northeim Project. In this case, two rather than three quality classifications were used, namely: Premium 1 – at least 4 different forb species in all 3 segments of a transect, and Premium 2 – at least 6 different form species in all three segments of a transect (Groth, 2008; 2009) and the number of indicator species reduced from 40 to 32.

The best examples of 'strongly result-oriented' programs are again found in schemes designed to protect individual animal species. Here each individual breeding success outcome is rewarded, meaning that payments measure performance directly rather than through the achievement of an arbitrary threshold. This is the case, for example, in the payment by clutch Dutch meadowbirds scheme (Musters et al., 2001; Verhulst et al., 2007) and the Swedish predator scheme (Zabel and Holm-Müller, 2008).

However, initially the Swedish scheme operated under a budgetary constraint which

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capped the payments irrespective of the number of successful reproductions – thus effectively providing a payment threshold beyond which herders were not incentivised to increase ‘production’. The removal of this cap in 2000 saw an upward trend in predator numbers, but insufficient data are available to be certain the removal of the cap was the cause (Zabel and Holm-Müller, 2008)<sup>6</sup>.

The issue of payment thresholds is a critical one for any new scheme to deal with.

While strongly result-oriented schemes may provide a closer link between provision and financial reward, payments are also more vulnerable to variations in environmental conditions – as well as being more expensive to manage. As is apparent from the variety of approaches used in the German meadowland biodiversity schemes, more experimentation is required to determine the optimum number of thresholds to achieve a balance between incentivisation, payment stability and administration costs.

### *5.3 The temporal extent of the contracts and schemes*

The final dimension to scheme strength is the time frame of the scheme – both in terms of scheme duration and the length of contracts to farmers. Successful provision of environmental goods may take substantial investment by landowners in terms of

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<sup>6</sup> In some cases a cap may be desirable to prevent individual species numbers exceeding an ecologically sustainable level (Schwarz et al., 2008).

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increasing their skills, building knowledge, purchasing new machinery, and so on (Burton and Paragahawewa, 2011). This build up of resources takes time. In order to reduce the risk that this investment is not rewarded, a longer time-frame of guaranteed income availability may be required than is the case for action-oriented schemes. Increasing scheme and contract time-frames is thus likely to strengthen the relationship between payments for outcomes and the outcomes themselves, boosting the efficacy of the scheme.

This may seem to contradict the literature. In particular, a number of studies have suggested that, under action oriented schemes, farmers prefer relatively short contracts to provide them with an opportunity for exiting the scheme or changing the options when contracts expire and are renegotiated (Lütz and Bastion, 2002; Pasquini et al., 2009; Ruto and Garrod, 2009). However in (strongly) result-oriented schemes the flexibility provided by time-limited contracts is replaced by the flexibility to innovate within the scheme – to determine when to change management practices and whether or not to produce environmental goods in any particular year. For the purchaser assurance of continuity of environmental goods provision is thus provided not by fixed legal contract and financial reward (with all assurances terminating at the end of the contract), but as a result of farmers' investment in skills, knowledge and equipment, combined with the cost incurred of re-establishing high levels of environmental goods if provision is halted, and the social cost of withdrawing if neighbouring farmers continue in the scheme. This could also be underlain by

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command and control regulation to provide a safety net for the environment (as is necessary in most applications of neoliberal environmental governance – Coombes, 2003; Bräuer et al., 2006) without significantly reducing the strength of the incentives.

#### *5.4 A framework for result-based agri-environmental schemes*

The above analysis enables a conceptual framework to be constructed based on the extent to which schemes are strongly or weakly result oriented (figure 1).

*Figure 1: The three dimensions contributing to 'weak' and 'strong' result-orientation.*

As an illustration we can take an example of a scheme where most of the payments are delivered on the basis of outcomes but there is (a) only a weak sensitivity to the payment system such as a single tier or entry criteria, and (b) there is no certainty of how long the scheme will run for and contracts to farmers are short term. In this case, while the basis is there for a result-oriented scheme, it is unlikely to be sufficient to encourage the innovation and commitment required to introduce significant and long-term cultural and environmental change. In contrast, a scheme only moderately result-oriented but with a sensitive payment structure to promote continued improvement, and long-term commitment to funding to facilitate investment in skills and knowledge is, we contend, likely to achieve better results. As base payments can encourage risk-



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averse farmers to engage (Schwarz et al., 2008; Zable and Roe, 2009) this would seem a preferable alternative – at least in the initial stages of the scheme.

Getting the balance right between these three key scheme dimensions is likely to be one of the big challenges for Europe's result-oriented schemes in the future. Devising payment structures that compromise between scheme complexity (and difficulty of administration) and scheme sensitivity, developing payment time-frames that both provide the certainty of continuity of payment to farmers but simultaneously deliver value for money to the public, and balancing the incentive provided by outcome-based payments against the need to entice farmers to participate in the scheme are all key issues for scheme development. The second big challenge (currently being addressed in the German programs) is associated with developing appropriate indicators such that the schemes are sensitive enough to deliver locally appropriate results and are able to entice farmers to participate but, at the same time, are not overly difficult or expensive to administer.

Introducing result-oriented schemes to Europe may well be a slow process. Action-oriented policies have an immediate effect on behaviour as payment is made for the behavioural changes themselves. In contrast, the successful implementation of result-oriented payments necessitates the gradual build up of farmers' skills and knowledge, the restructuring of horizontal social networks based on environmental cultural capital, the development of new vertical networks between farmers conservationists

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and policy-makers, and, in general, disembedding conventional farming cultures from conventional beliefs about the 'conflict' between agricultural production and the production of environmental goods.

Given this, we contend, the immediate implementation of 'strong' forms of result-orientation to meet all environmental objectives might be a mistake. Although ultimately the stronger the result-orientation the more likely it is to encourage innovation, weaker forms are likely to be more effective in the initial stages before cultural and social capital has been established. The risks may be too high to make the approach attractive to farmers, and, simultaneously, the risks of a failure of provision and consequent environmental damage too high for funders and the public.

However, while preferable in the initial stages, weaker forms of result-orientation are ultimately unlikely to encourage higher levels of innovation or promote the cultural embeddedness of environmental goods provision. Consequently, we contend that roAEMs should plan for transition from weaker to stronger forms over the time frame of the project. This may take the form of changing the payment instruments to make them more sensitive as farmers' skills in species recognition and management increase, extending the length of contracts once farmers' confidence in their ability to provide (and be paid for it) has developed, or reducing the proportion of base payments as skills, knowledge and social networks increase and reduce the risk of failure.

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Currently the majority of Europe's result-oriented schemes are relatively weak because of high levels of base payments (and an underlying system of EU environmental subsidies), concern for complying with EU requirements<sup>7</sup>, and the short time-frame of many of the schemes due to their trial or experimental nature (e.g. Haaren and Bathke, 2008). Consequently, while these schemes are extremely important for developing our understanding of result-oriented payments, it cannot be claimed that the results are typical of a fully market-based approach to environmental provision. The WTO requirements remain a major stumbling block to strongly result-based schemes as they restrict one of the key dimensions, namely the ability of governments to develop schemes with proportionately high result-orientation and limited prescribed management requirements.

However, Schwarz et al. (2008) contend that a more flexible interpretation of the WTO requirements provides a possible solution to this problem. In particular, the preamble to the Agreement on Agriculture implicitly acknowledges the legitimacy of domestic policies to address environmental market failures as non-trade concerns, and agri-environment schemes could thus be viewed as trade correcting or at least as less trade distorting than previous policies – a stance already adopted by other WTO panels when considering policy changes. Although some commentators have

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<sup>7</sup> For example, Matzdorf and Lorenz (2010) note that the Baden Württemberg result-oriented program embedded a restriction on silage making before the 1<sup>st</sup> of June in order to bring the program in line with Council Regulation (EC) No 1783/2003.

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concluded that this would require high-level negotiations and an ability to demonstrate the limited impact of public good provision on commodity trade (Latacz-Lohmann and Hodge, 2001; Blandford and Josling, 2007; Blandford and Hill, 2008), there is another possible interpretation of the evidence. If it is accepted that domestic policy legitimately addressing environmental market failures is a non-trade concern, then all that is required is to justify the two conditions set out in paragraph 12, that payments have to be part of a clearly-defined government environmental or conservation programme and have to be based on additional cost and income foregone (Barnes et al., 2011).

The requirement to calculate payments based on additional cost and income foregone does not sit well with the intervention logic of strongly result-oriented payments.

Designing a scheme to achieve specific outcomes but then setting payment rates with reference to the costs of actions that may be required rather than the value of the outcome is inconsistent. It may also be inefficient if there are a variety of different ways of achieving a given outcome. The issue of quantifying payment levels which reflect different levels of environmental outcomes remains one of the key challenges for the practical implementation of strongly result-oriented AESs (Schwarz et al., 2008).

Auctions have been considered as one option to address this challenge. The use of auctions not only has the potential to improve the cost effectiveness of agri-

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environmental schemes (Bertke et al., 2008, Stoneham et al., 2003, Latacz-Lohmann and Schilizzi, 2011), but would also satisfy the WTO rules as well as EU requirements defined in the current rural development regulation (Eggers et al., 2007). Bids would be invited for delivering outcomes rather than following management prescriptions, which would resolve the tension arising in strongly result-oriented schemes that seek particular outcomes but would still reward actions. However, whilst auctions reduce the need for government agencies to collate average cost data, some form of demand-side measurement would be needed to establish the maximum unit price or aggregate quantity that public expenditure should be supporting (Schwarz et al., 2008).

## 6. *Conclusion*

In this review paper we have discussed the potential for the introduction of roAEMs in Europe. Despite the general positive nature of the assessment there are, of course, many potential problems involved in implementing result-based measures and however 'good' the theory and promising the initial results, there remains the prospect that it will fail. In particular, while we have illustrated the potential for schemes to generate non-economic forms of capital we also acknowledge that without economic capital, cultural and social capital are unsustainable, i.e. if the farm is not profitable and the farmer ceases farming as a result, the accumulated cultural and social capital is effectively of no value. Non-economic capital alone will not maintain a farm and,

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ultimately, farmers will take any necessary measures to ensure the farm remains profitable – including sacrificing their reputation or skills developed in environmental provision by reversing environmental improvements. How this would develop in a market situation where commodity prices fluctuate substantially and farmers are not compelled to maintain environmental provision is as yet unknown.

There is also the issue of how widely result-oriented approaches should be applied. In this paper we have made the assumption that the purpose of agri-environmental policy is the provision of environmental public goods. However, if some of Europe's trading partners are correct and its main objective is actually to provide farmers with back-door production subsidies (see Bills and Gross, 2005; Dibden et al., 2009), then action-oriented schemes may be a better means of reaching these goals as they constitute non-targeted horizontal payments to farmers (Matzdorf et al., 2008). Similarly, as noted above, there may be situations where result-oriented schemes are simply not effective in meeting the provision-goals, in particular when it is not possible to develop simple, reliable and self-monitorable indicators. In further cases, the potential biodiversity loss may simply be too great to entrust provision to a market-based approach. Finally, very little experience has so far been generated in applying result-oriented AEMs for environmental objectives other than biodiversity conservation or enhancement – thus the question of how widely these approaches can and should be applied remains an open one. Result-oriented schemes may thus be better viewed, not as the logical market-based successor to action-oriented

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approaches, but rather as part of a mix of agri-environmental policy strategies to be targeted at particular situations rather than applied unilaterally.

We are only just beginning to understand how to apply roAEMs in a European context and the likely outcomes. While there are clear political and economic rationales for linking payment to provision, there is as yet neither sufficient understanding of the processes for implementing such schemes, nor any certainty of the environmental outcome – especially at wider scales. In particular, we need more empirical studies into how farmers are likely to respond to result-oriented approaches before initiating major changes to current policies. Consequently, despite growing pressure in government circles for rapid change, we contend it would be a mistake to jump into result-oriented provision without making a major attempt at the EU level to understand exactly what is required for success and what the long-term environmental, economic and social outcomes are likely to be.

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