Optimizing the management of Natura 2000 network in Lithuania (LIFE IP PAF-NATURALIT)

Project No. LIFE16 IPE/LT/016

Overview on EU good practices on innovative agri-environmental measures and recommendations to Lithuania

Review of good practices of outcome-based and collective agri-environmental measures

Dr. Gerald Schwarz

Dr. Steffen Noleppa

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Acknowledgement

The report is part of the LIFE project No. LIFE16 IPE/LT/016 supported by the EU LIFE Programme and the Republic of Lithuania. We particularly thank Zymantas Morkvenas and the Baltic Environmental Forum Lithuania for the continuous and valuable feedback and Sophia Lüttringhaus from HFFA Research GmbH for technical assistance and overall support. The results displayed below, however, are the sole responsibility of the authors.

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List of abbreviations

AEM – Agri-Environmental Measure

BEF – Baltic Environmental Forum

CAP – Common Agricultural Policy

DAFF – Department of Agriculture, Fisheries and Food

ENRD – European Network for Rural Development

EU – European Union

FRESP – Florida Ranchlands Environmental Services Project

HNV – High Nature Value

LCA – Landcare Associations

NOC – National Organization Committee

PEPA – Performance-based Environmental Policies for Agriculture Initiative

PES – Payment for Ecosystem Services

RBAPS – Results Based Agri-environment Payment Scheme

RDP – Rural Development Plan

Executive Summary

Lithuania aims at exploring the revision of its AEMs towards outcome-based approaches and collective concepts. The aims of this report are to review and identify innovations in AEM design, implementation and administration potentially relevant for future biodiversity conservation schemes in Lithuania. More particularly, this analysis focuses on experiences in the application of (a) outcome-based and/or (b) collective approaches in AEMs, which result in better environmental effectiveness and targeting. In addition, it aims at identifying some first lessons learnt for the later design and implementation of future innovative biodiversity AEMs in the Lithuanian rural development plan (RDP).

The review is based on an analysis of the official inventory of the European Commission as regards "result-based agri-environment schemes" and additional literature searches of new outcome-based pilot schemes, cooperation in AEMs and innovations outside the EU. The review covered thirty examples of European outcome-based and / or cooperative approaches in AEMs and eight examples from outside the EU (e.g. North America and Australia).

The report identifies nine key elements of good practice offering innovative aspects for improving the scheme design and implementation, payment design and administration and monitoring of AEMs in Lithuania. These include: cooperative approach in AEMs, cooperation across rural actors, joint implementation of AEMs with advisory support, awareness raising components such as ecological championships, differentiation of different ecologic qualities, combined payments across different levels (e.g. parcel and biodiversity networks), competitive bidding (auction approach), cooperation of farmers with nature protection authorities in implementation and administration, and involvement of farmers in monitoring.

The scale of the application and the spatial targeting of AEMs are important key issues for the design of future biodiversity schemes in Lithuania. Agri-environmental contracts with individual farm managers are limited in delivering biodiversity benefits at landscape, catchment or even wider scale. Individual farm contracts are thus not adequate to address biodiversity concerns and some form of collective action and coordination is needed.

Spatial targeting, result-based design and long-term contracts improve the effectiveness of support instruments. Achieving the desired provision of biodiversity benefits requires spatial coordination of locally implemented collective action for land management. Cooperation and coordination is needed in the long-term to achieve outcomes both at parcel and landscape level.

A common success factor highlighted across many of the reviewed examples is the importance of close and trusting cooperation between land managers, administrations and other stakeholders from the start of the development phase of the scheme. This includes a joint assessment of the extent of the problem(s) the AEM shall address as well as the development of strategic objectives and the payment design. It does not only apply to cooperation between land managers and conservationists but also to cooperation at the administrative level. A jointly designed pilot scheme addressing the different concerns of the involved main stakeholders encourages buy-into the approach and fosters acceptance.

The key questions then become how a new pilot biodiversity scheme can be designed and implemented and what key issues need to be considered in the practical implementation. One of the main dilemmas which needs to be dealt with is that a new biodiversity scheme with too little change and risk (compared to previous AEMs) is unlikely to lead to the desired biodiversity improvements and outcome. But a scheme with too much change, or where the risk is too high, is likely to fail and won't be acceptable for farmers and administrations.

This requires a better understanding of the particular relevance of the identified good practice key elements in a Lithuanian context from the perspective of different key actors such as ministry administrations and environmental NGOs and land managers. A simple exercise conducted with key actors indicate the highest stakeholder priority for piloting a cooperative approach in AEMs in Lithuania and the involvement of farmers in the monitoring of the new measure(s). In addition, at least 50% of the participating key actors indicated the following good practice elements as relevant for testing in pilot schemes: Awareness raising components such as ecological championships, differentiation of different ecologic qualities, combined payments across different levels and cooperation of farmers with nature protection authorities in implementation and administration. An outline of possible pilot scheme will be developed in the next phase of the project.

1 Introduction

Management based agri-environmental measures (AEMs) are used across the European Union (EU) and elsewhere since decades to bridge agricultural activities and natural requirements for the better of society. As such, they have been criticized, among others, for failing to stronger focus on outcomes or results and for not properly addressing collective landscape scale delivery issues. Hence, there is a need for further improvements of the design, targeting and implementation, as well as for greater provision of advice to farmers and investment in improving (collective) institutional capacity. Key issues in the discussion of future revisions are, thus, improved targeting of environmental outcomes, long-term attitudinal and cultural change of land managers, improved spatial coordination and cooperation at landscape scale (Burton and Paragahawewa, 2011; Schwarz and Zilans, 2016) across the EU and beyond.

Lithuania aims at exploring the revision of its AEMs towards outcome-based approaches and collective concepts. In light of this, specific problems of AEMs with biodiversity objectives have to be considered. In the Lithuanian context, these are – among others – the following aspects:

- Most of the AEM support schemes are too generic and not specifically adjusted to conservation objectives of the specific areas (i.e. particular species and habitats).
- Areas managed under the biodiversity conservation support schemes of the AEMs are rather small and scattered across the country; thus, little concentration makes little effect in priority areas.
- All of the support schemes are mainly management-oriented; thus, disconnection between input and outcome provides little value for money.

New approaches aiming at a stronger focus on outcomes and incentivising cooperation and inter-generational/community-wide behavioural change have been tested and implemented in a large number of EU member states and further afield, for instance in the USA and Australia. In the Netherlands, to take an example, the whole system of AEMs was transferred to a collective and result-based approach (Ministry of Economic Affairs, 2016).

The experience from such already existing outcome-based and collective AEM examples in other countries (see also Burton and Schwarz, 2013; Matzdorf et al., 2014; Allen et al., 2014) highlights the potential of these approaches to further improve the implementation and administration of AEM schemes in the EU and particularly also in Lithuania.

Within the frame of the LIFE project "Optimizing the management of Natura 2000 network in Lithuania" examples of EU good practices on innovative AEMs and recommendations for future applications in Lithuania shall be given. The main objective of the respective workload is to provide a basis for the integration of innovative and targeted approaches for biodiversity conservation schemes in Lithuania based on the current evidence of good practices of (collective output-based) AEMs in other countries. Therefore, two deliverables have to be provided:

(1) A review of innovative approaches in AEMs focussing but not exclusively concentrating on the EU and

(2) A proposal for the biodiversity conservation scheme under AEMs in Lithuania.

Consequently, it is the objective of this first project report – i.e. deliverable (1) – to review and identify innovations in AEM design, implementation and administration potentially relevant for future biodiversity conservation schemes in Lithuania. More particularly, this analysis focuses on experiences in the application of (a) outcome-based and/or (b) collective approaches in AEMs, which result in better environmental effectiveness and targeting. In addition, it aims at identifying some first lessons learnt for the later design and implementation of future innovative biodiversity AEMs in the Lithuanian rural development plan (RDP).

To meet the objective, a well-structured analytical concept is chosen. The approach is mirrored by the following structure of the report:

- After these introductory remarks, chapter 2 provides a working definition for outcome-based and collective approaches in the context of this project (sub-chapter 2.1), as well as a short summary of their "historic" development in AEMs in mainly the EU and its member states (sub-chapter 2.2).

- Chapter 3, then, introduces the framework of our review. More particularly, the logic structure of the review, which defines key criteria to identify innovative elements potentially relevant in a Lithuanian context, is discussed (sub-chapter 3.1), and a synthesis of what has been reviewed so far is additionally provided (sub-chapter 3.2).

- Based on this structure and synthesis, key innovative elements in outcome-based approaches and cooperation in AEMs and examples of their application are comprehensively discussed in chapter 4. The chapter includes a summary table of the specifically identified innovative elements with examples of their application (sub-chapter 4.1), discusses in more depth some innovative elements in scheme design and eligibility criteria (sub-chapter4.2), highlights

other innovative elements in payment design (sub-chapter 4.3), and also debates innovative elements in administration and monitoring (sub-chapter 4.4).

- Chapter 5, finally provides some lessons already learnt, i.e. a first set of conclusions and recommendations with respect to future biodiversity conservation schemes in Lithuania and as regards the formulation of the second project paper.

2 Outcome-based approaches and cooperation in agri-environmental measures: definition and development

The following analysis focuses on outcome-based approaches and cooperation in AEMs. Both terms need to be defined in order to properly describe the scope of this study. To set the basis for further argumentation, it is also necessary to discuss most recent developments as regards outcome-based approaches and cooperation. In this respect, the following is especially worth to be considered.

2.1 Definition for outcome-based and collective approaches of agri-environmental measures

Across the EU agri-environmental schemes provide important sources of funding which basically enable farmers to protect wildlife habitats on agricultural land. Although all these agri-environmental schemes are designed to deliver environmental results, they succeed in this to varying degrees. What defines an outcome-based scheme in this respect is that payments are made where a specific result (or outcome) is indeed achieved, making a direct link between the payment and the delivery of biodiversity or other environmental results on the ground (Directorate General for Environment, 2017). Hence, outcome-based schemes focus on payments that reward measurable improvements (or developments) in farmland biodiversity.

More precisely, Directorate General for Environment (2017) defines results-based, i.e. in the context of this study outcome-based[1] payments as agri-environmental type schemes where farmers and land managers are paid for delivering a specific

[1] There is no single agreed definition of what constitutes an outcome-based agri-environmental payment scheme. Other terms also used to describe such schemes include outcome-focused schemes, results-based schemes and payment by results (see also Allen et al., 2014).

environmental result (outcome), e.g. enabling or enhancing the presence on their land of specific breeding birds, butterflies or important flowers found in grasslands.

Hence, outcome-based AEMs can and shall be considered a different type of agri-environmental payments (in comparison to management-based AEMs) where according to Keenleyside and Oppermann (2017) paying for results (outcome) means:

- defining very specific biodiversity-related objectives for the land parcel which are being targeted,
- defining indicators of this biodiversity, which are results or outputs that can be verified (i.e. measured) and
- paying farmers for the (verified/measured) quantity and quality of the biodiversity indicators.

However, while the above definition focusses on parcel level applications, outcome-based payments can also be applied at landscape scale, increasing the complexity of the scheme due to the need for coordination across different service provide (e.g. farmers) (Schwarz et al., 2008).

In outcome-based schemes farmers can choose what management is required to achieve the desired result(s), rather than being required to carry out specific management actions as in the case of management-based AEMs (Directorate General for Environment, 2017). In light of this, Figure 1 provides a more detailed comparison of (a) outcome-based AEMs vs. (b) management based AEMs.

Figure 1: Comparison of outcome-based vs. management-based agri-environmental measures

Outcome-based AEMs	Criteria	Management-based AEMs
Yes	Clearly defined objectives for habitats and species dependent on farmland	**Partial**
Yes	Effectively targeted (in terms of geographical zones, farm types, habitats, and/or species)	**Partial**
Yes	Payment for the presence of measurable biodiversity indicators	**No**
No	Payment (normally as flat rate) for prescribed farm management activities	**Yes**

Source: Own figure based on Keenleyside and Oppermann (2017).

Focussing payments on achieving outcomes rather than on following a set of management activities offers farmers the flexibility to use their knowledge and experience to cultivate their land in a way that benefits both agriculture and biodiversity. As such, outcome-based payment schemes more frequently lead to an enhanced awareness of the importance of biodiversity conservation and protecting environmental resources as part of agricultural activities (see also Directorate General for Environment, 2017).

Although some studies suggest that action-based schemes should ideally 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 (Schmitzberger et al., 2005; Herzon and Mikk, 2007; Schenk et al., 2007). The problem is effectively twofold:

- First, the practice of restricting farmers' behaviour does little to foster commitment to nature conservation (Muster et al., 2001). In fact, restrictions on behaviour are often viewed with resentment and act as a disincentive for scheme participation (Wilson and Hart, 2001).
- Second, providing extrinsic rewards for performing behaviours generally weakens intrinsic motivations rather than strengthening them (Deci et al., 1999). Thus, providing monetary rewards for performing set services may not induce the attitudinal or cultural change required for the necessary long-term behavioural changes (Burton and Paragahawewa, 2011) and may in practice even serve to hinder those changes.

Outcome-based payments, which allow farmers to engage, to innovate and to utilize existing knowledge in environmental provision would address those limitations (Zilans et al., 2016). Outcome-based payments operationalize the learning component of adaptive management for all actors, increase the awareness of land managers about the biodiversity on their land, and contribute to public recognition of farmers' role in supporting biodiversity (Fleury et al., 2015; Herzon et al., 2018). Indeed, a number of studies highlight the potential of the outcome-based approach to improve the environmental targeting and the promotion of attitudinal changes of farmers towards this direction (see, e.g., Schwarz and Morkvenas, 2012).

In practice, many examples combine elements of management-based and outcome-based payments, reflecting the more complex nature of a pure outcome-based PES. It is helpful to review if a payment is more management-based or more outcome-based in its design to consider whether the service providers have the flexibility to consider alternative management options at the local level. If this flexibility is given, the payment for ecosystem services (PES) would address key advantages of outcome-based approaches in fostering innovative management and cooperation between farmers and conservationists (Burton and Schwarz, 2013).

Going a step further, collective approaches can be linked with outcome-based AEMs. According to Sulima (2018), it might be necessary in certain cases to have a minimum number of farmers signing a contract in a particular geographical area. This might be desirable to maintain local landscape, to reduce pollution and/or to protect certain species not only field-based but within a territory or habitat network. In such and other cases, expenditure for a few individual contracts – even if they are outcome-based – may not be effective. One way to ensure that a sufficiently large group of farmers delivers the necessary environmental benefits is through collective approaches with which a territorial approach is chosen to achieve territorial results (or outcomes). The assumption is that such cooperative approaches enhance farmers' intention to participate by facilitating the application of AEMs, but also by generating group pressure (van Dijk et al, 2015).

Such a cooperative approach for agri-environmental measures has been introduced in the Dutch RDP with the beginning of the current programming period. Agri-environmental contracts are made with cooperatives which are then responsible for the implementation of measures and allocation of payments across participating farmers (Ministry of Economic Affairs, 2016). Policy support for cooperation in rural development and agri-environmental land management is also available through Measure 16 in the RDPs of other EU Member States, but the planned expenditure for this measure under Priority 4 is with EUR 439 million across all EU member states low (ENRD, 2016).

New approaches aimed at incentivising cooperation and community-wide behavioural change have recently been proposed in public and private initiatives but, as yet, our understanding of how to optimise their potential for promoting lasting, widespread and cost-effective public good provision is limited. Uetake (2012) distinguishes two types of collective action:

(i) cooperation, i.e. bottom-up, and

(ii) coordination, i.e. top-down, agency-led collective action.

Some innovative institutional arrangements that may represent the basis for collective action for the provision of agri-environmental public goods can also be conceptualised through the definitions of co-management and co-production (see Vanni, 2013)[2].

Particular attention needs to be paid to the engagement of different public, private and civil society actors, identifying demand-driven ways of coupling public and private incentives for public good provision to coordinating support across different

[2] A more detailed discussion of collective action and approaches is provided by Vanni (2014).

land and value chain levels, and to improving not only horizontal (among farmers) but also vertical (between farmers and other actors) cooperation. Few examples of vertical cooperation in agri-environmental initiatives exist such as "Landcare" initiatives or small local examples such as the "Water Protection Bread" in Upper Franconia in Germany (see also section 3.2), which can provide insights into possible cooperation mechanisms for biodiversity support schemes in Lithuania.

2.2 Historic development of agri-environmental measures in the European Union with special emphasis on outcome-based schemes and collective approaches

The conceptualization and implementation of AEMs in first EU member states started in the 1980s – at that time still on their own initiative (Directorate General for Agriculture and Rural Development, 2005) and on a voluntary base (Schwarz and Morkvenas, 2012). The approach, however, soon was taken up by the EU, more precisely in 1985, but remained optional for single EU member states.

Only by 1992, with the McSharry reform, the concept of AEMs was introduced for all EU member states as so-called "accompanying measure" to the Common Agricultural Policy (CAP). Since then, individual EU member states were required to introduce AEMs. With the turn of the millennium, the AEM concept was incorporated into the rural development regulative framework as part of the "Agenda 2000"-CAP and successively into RDPs. Today, AEMs can be considered a "success story". At the end of the RDPs covering the period 2007-2013, the agricultural area under agri-environmental commitments amounted to nearly 46.9 million hectares and represented 26.3 percent of the utilized agricultural area in the EU (28) (Eurostat, 2018).

Within the more general AEM approach of the EU, outcome-based schemes have also been increasing steadily since the 1990s. However, the development was rather slow in terms of numbers and scope (Allen et al., 2014). Probably the first very well-known outcome-based schemes in the EU were the "species-rich grassland" schemes in Germany and France. Of these, the "Baden-Württemberg Grassland Scheme" can be considered the longest running scheme. In fact, it was the first outcome-based AEM under the CAP and became part of the regional agri-environmental programme in the year 2000. Designed as a top-up payment scheme – i.e. not as a "pure" but "hybrid" payment for achieving a biodiversity gain[3] – it became a regional success story with approximately 10,000 farmers applying and

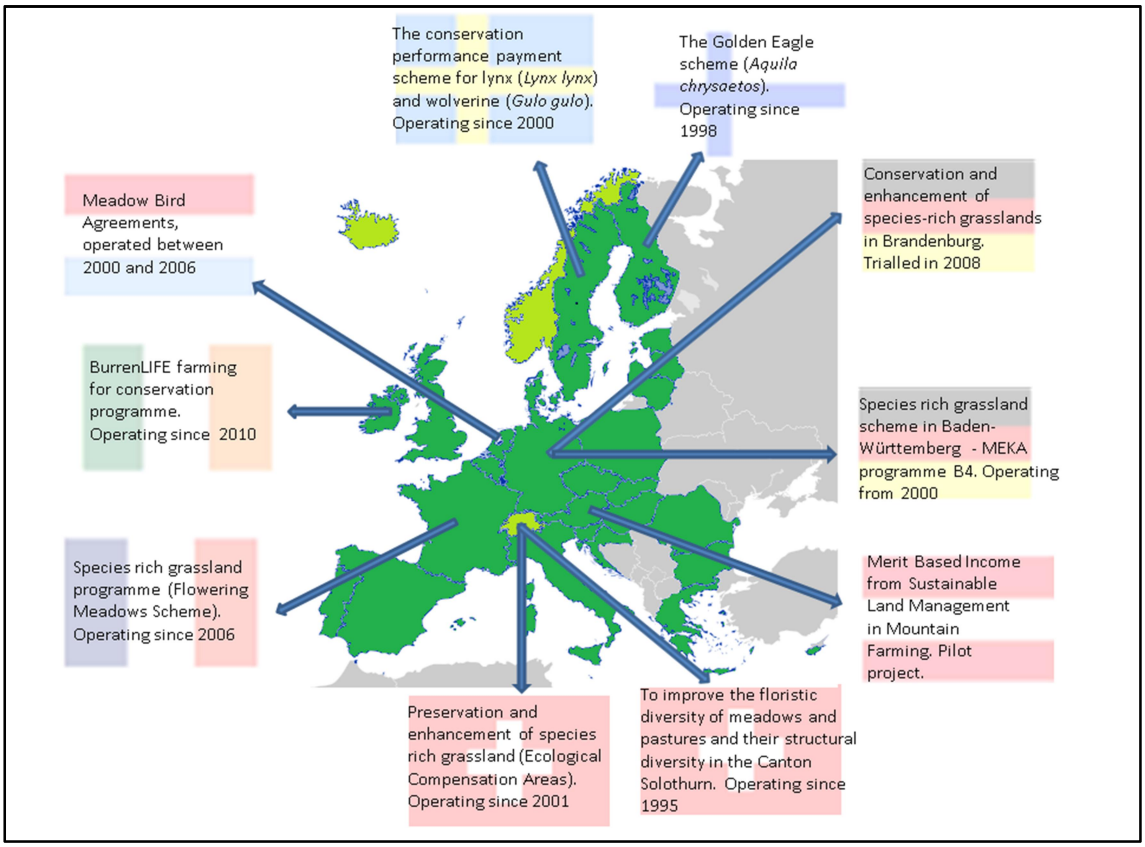
[3] Frequently, a hybrid type of AEMs can be observed. A hybrid type of an AEM is a measure which basically consists of a management-based approach and – often on top of that – an outcome-based concept.

managing more than 60,000 hectares as "High Nature Value" (HNV) grassland (Allen et al., 2014).

This success soon led to interest in developing similar approaches in, for instance, France. Outcome-based schemes have been introduced as a means of moving away from a generalised approach to delivering agri-environmental management. This has led to the introduction of "prairies fleuries" schemes supported and promoted actively by local actors, including farmers and land owners, as well as national stakeholders. Other EU member states (such as Austria, the Netherlands, Sweden and the United Kingdom) followed and by 2014, there were more than 30 outcome-based schemes in operation or planned in EU member states (and EFTA countries) (see, again, Allen et al, 2014). In fact, at that time, outcome-based AEMs were distributed throughout the EU, but the majority of examples was found in Northern and Western EU member states.

Today, distribution of outcome-based AEMs across the EU is more widespread, as Figure 2 partially illustrates.

Figure 2: Major outcome-based agri-environmental measures in the EU



Source: Directorate General for Environment (2017).

According to Directorate General for Environment (2017), these approaches cannot only be found in Germany and France, but also in Finland, Sweden, Ireland, the Netherlands, and Austria. Keenleyside and Oppermann (2017) additionally list Spain. This allows to state that there already is a wide variety of approaches to implementing EU-based outcome-based schemes in practice. As such, outcome-based AEMs are funded in a variety of ways (Directorate General for Environment, 2017): Most of the existing schemes are funded through public funding such as the CAP of the EU, as well as national or regional funds; however, some private initiatives also exist.

Although implementation via individual farmers and land managers is still the "normal" procedure, some implementation already takes place through collective approaches. In the Netherlands, for instance, local communities are participating; or, to take another example, indigenous communities, such as the Sami reindeer herders, are involved in Sweden.

Not only in the EU, outcome-based AEMs became more frequent. Other parts of the world with intensive agriculture have comparable schemes (Batary et al., 2015). Apart from the EU member states (and Switzerland), countries in North America (USA, Canada) and in Oceania (Australia, New Zealand) have placed increasing effort on agri-environmental programs introducing a large number of policy measures to purchase environmental goods and services (such as biodiversity gain) from rural landscapes (Vergamini et al., 2015). Interesting examples relevant for this review can for example be found in North Amercia (see, e.g., Winsten et al., 2011) and Australia (see, e.g., Ansell et al., 2015).

3 Framework of the review

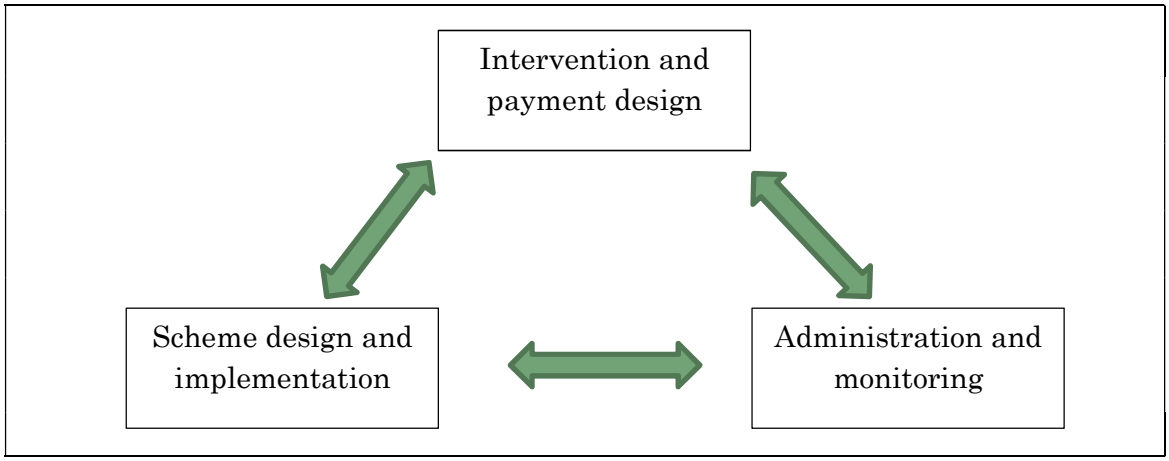
This review is based on a specific logic structure and mainly concentrates on AEMs in the EU. The structure of the review and an overview of reviewed examples are shortly described in the following.

3.1 - Logic structure of the review

Our review is based upon on past reviews carried out and follows the conceptual frameworks used by Schwarz et al. (2008), Schwarz and Morkvenas (2012), Burton and Schwarz (2013), Zilans et al. (2016) and Matzdorf et al. (2014). However, due to the specific requirements of this study, we will use a slightly adjusted logic structure which more particularly aims at identifying innovative elements which have the potential to improve biodiversity support schemes in Lithuania.

In the review we, therefore, differentiate between and focus on three main dimensions, which are summarised in Figure 3.

Figure 3: Three main dimensions of agri-environmental measures of the review



Source: Own figure.

In the context of this study a set of altogether nine key elements offering innovative aspects for improving AEMs could be identified in the review, which could be allocated to the three key dimensions mentioned above. They are defined as follows:

(1) Cooperative approach in AEMs,

(2) Cooperation across rural actors,

(3) Joint implementation of AEMs with advisory support,

(4) Awareness raising components such as ecological championships,

(5) Differentiation of different ecologic qualities,

(6) Combined payments across different levels (e.g. parcel and biodiversity networks),

(7) Competitive bidding (auction approach),

(8) Cooperation of farmers with nature protection authorities in implementation and administration, and

(9) Involvement of farmers in monitoring.

To better structure the following analysis, these nine key good practice elements were properly allocated to the three focal points as visualized with the following Figure 4.

Figure 4: Main dimensions and key good practice elements of the review

Innovative elements in scheme design and implementation	Innovative elements in intervention and payment design	Innovative elements in administration and monitoring
Key element 1: Cooperative approach in AEMs	**Key element 5:** Differentiation of different ecologic qualities	**Key element 8:** Cooperation of farmers with nature protection authorities in implementation and administration
Key element 2: Cooperation across rural actors	**Key element 6:** Combined payments across different levels (e.g. parcel and biodiversity networks)	**Key element 9:** Involvement of farmers in monitoring
Key element 3: Joint implementation of AEMs with advisory support	**Key element 7:** Competitive bidding (auction approach)	
Key element 4: Awareness raising components such as ecological championships		

Source: Own figure.

3.2- Synthesis of what has been reviewed

The review is based on an analysis of the official inventory of the European Commission as regards "result-based agri-environmental schemes" and additional literature searches of new outcome-based pilot schemes, cooperative approaches and innovations outside the EU.

First, the inventory of the European Commission as regards "results-based agri-environmental schemes" was carefully studied. It altogether lists 19 outcome-based agri-environmental schemes (in operation) across the EU – one in Ireland, four in the Netherlands, seven in Germany, one in Austria, one in Finland, one in the United Kingdom, one in Sweden, one in Spain, and two in France – and, in addition, two in Switzerland as displayed in the following Figure 5.

Figure 5: List of outcome-based agri-environmental schemes listed by the European Commission and used for review

Country	Outcome-based agri-environment measure	URL: http://ec.europa.eu/environment/nature/rbaps/fiche/…
Ireland	Burren Farming for Conservation Programme (BFCP)	…burren-farming-conservation-programme-bfcp_en.htm
The Netherlands	Meadow bird agreement with agri-environmental cooperatives	…meadow-bird-agreement-agri-environment-cooperative_en.htm
	Per clutch trials	…clutch-trials-netherlands_en.htm
	Species-rich grassland and arable botanical management agreements	…species-rich-grassland-and-arable-botanical-manage_en.htm
	Meadow Bird Agreements	…meadow-bird-agreements-2000-2006-netherlands_en.htm
Germany	Species rich grassland (Artenreiches Grünland - Kennarten)	…species-rich-grassland-artenreiches-grunland-kenna_en.htm
	MEKA programme B4 - species rich grassland scheme	…meka-programme-b4-species-rich-grassland-grassland_en.htm
	The programme Blühendes Steinburg	…programme-bluhendes-steinburg-germany-schleswig-ho_en.htm
	Grassland bird protection payments	…grassland-bird-protection-payments-germany-schlesw_en.htm
	Harrier nest protection in arable fields	…harrier-nest-protection-arable-fields-germany-nord_en.htm
	Maintenance of traditional orchards	…maintenance-traditional-orchards-germany-various-l_en.htm
	Maintenance of species rich grassland through results-based agri-environmental schemes	…maintenance-species-rich-grassland-through-results_en.htm
Austria	Results-based nature conservation plan (Ergebnisorientierter Naturschutzplan)	…results-based-nature-conservation-plan-ergebnisori_en.htm
Finland	Golden Eagle conservation scheme	…golden-eagle-conservation-scheme-finland_en.htm
United Kingdom	Farm Conservation Scheme	…farm-conservation-scheme-england_en.htm
Sweden	Conservation performance payments	…conservation-performance-payments-sweden_en.htm
Spain	RAPCA (Red de Áreas Pasto-Cortafuegos de Andalucía)	…rapca-red-de-areas-pasto-cortafuegos-de-andalucia-_en.htm
France	Pastoral management plan (Gestion pastorale: HERBE_09)	…pastoral-management-plan-gestion-pastorale-herbe_0_en.htm
	Species rich grassland programme (Flowering Meadows Scheme: HERBE_07)	…species-rich-grassland-programme-flowering-meadows_en.htm
Switzerland	Species rich vineyards (Rebflächen mit natürlicher Arten- und Strukturvielfalt)	…species-rich-vineyards-rebflachen-mit-naturlicher-_en.htm
	Preservation and enhancement of species rich grassland (Öko-Qualitätsverordnung)	…preservation-and-enhancement-species-rich-grasslan_en.htm

Source: Own figure based on Directorate General for Environment (2017).

From these schemes, the vast majority (16) are related to the farm type "Grassland/livestock"; the rest refers to "Permanent Crop", belongs to "Arable" and "Other". What concerns the biodiversity issue mainly taken into consideration by a scheme, more than half refer to "Habitats" and some are related to "Species", only a few to "Ecosystem". Finally, the funding source can be distinguished: Almost all are publicly financed – either via the EU, from a national or regional perspective, only one is privately financed and one by "Other" means (see, again, Directorate General for Environment, 2017).

These examples of outcome-based agri-environmental schemes are officially listed by the European Commission. However, new pilot schemes of outcome-based AEMs have been initiated since then (e.g. outcome-based payments for grasslands in Romania and for arable land in the United Kingdom, both commissioned by the Directorate General for Environment). In addition, the above list does not include outcome-based examples from outside the EU and examples of cooperative approaches in AEMs.

Therefore, a complementary literature search was carried out, updating the results of the reviews conducted in the past (e.g. Schwarz and Morkvenas, 2012). More than 50 articles and reports – all published in 2013 or later – were identified as potentially valuable and have been incorporated into the reference list at the end of this report. Thus, a number of further relevant examples of outcome-based and cooperative AEMs in the EU could be identified in the review. Those examples include schemes targeted at biodiversity or other public goods from agriculture such as water quality, where specific innovative elements could be identified, deemed to be transferable to biodiversity schemes.

Examples of further outcome-based schemes are as follows:

- Results-Based Payments for Biodiversity: a New Pilot Agri-environmental Scheme for the Tarnava Mare and Pogány Havas Regions (see Fundatia Adept, 2018),
- Results Based Agri-environmental Payment Scheme (RBAPS) Grassland Pilot: Wensleydale, Yorkshire Dales (see Natural England, 2018a),
- Results Based Agri-environmental Payment Scheme (RBAPS) Arable Pilot: Norfolk/Suffolk (see Natural England, 2018b), and
- Pilot Results-Based Agri-environmental Measures in Ireland and the Navarra Region (Spain) (see European Forum on Nature Conservation and Pastoralism, 2018).

Examples of cooperative schemes are the following:

- Cooperative approach Netherlands (Ministry of Economic Affairs, 2016),
- Landcare Germany (Landcare Associations in Germany, 2016),
- Wasserschutzbrot (Government of Upper Franconia, 2018), and
- Kooperationsmodell Trinkwasserschutz in Germany (NLWKN, 2017).

Although the analysis focuses on the EU, some interesting examples from outside the EU add value for the discussion and implementation of further innovative aspects. Against this background, the following additional examples are worth to be taken into consideration (in alphabetic order of the author(s) providing more details on the specific case study):

- Environmental Stewardship Program (Australia) (see Burns et al., 2016),
- Medford Water Quality Trading Program (USA) (see Freshwater Trust, 2018),
- Florida Ranchlands Environmental Services Project (FRESP) (USA) (see FRESP, 2018),
- Endangered Woodland Ecosystems (Australia) (see Michael et al., 2014),
- Conservation Auctions in Ohio (USA) (see Palm-Forster et al., 2016),
- Greenfleet Biodiverse Carbon Plantings (Australia), EcoTender (Australia) and Biodiversity Stewardship Program (South Africa) (see Selinske et al., 2017),
- Reef Rescue Program (Australia) (see Taylor and van Grieken, 2015), and
- Performance-based Environmental Policies for Agriculture Initiative (PEPA) (USA) (see Winsten et al., 2011).

Based on this synthesis of what has been reviewed, the next chapter in more depth discusses the – what we consider – "innovative" particularities of these aforementioned approaches.

4 Key innovative elements in outcome-based approaches and cooperation in agri-environmental measures and examples of their application

4.1 Summary table of identified innovative elements with examples of their application

A number of good practice elements of AEMs have been identified in the review of existing examples. These good practice elements will be explained in the practical context of existing AEMs. This section provides an overview of the good practice elements and existing AEMs used to explain the elements in more detail in the following section. Figure 6 provides the overview.

Figure 6: Overview of good practice elements and relevant examples

Good practice (key) element	Relevant example schemes
(1) Farming cooperatives implementing AEMs	Cooperative approach Netherlands (Ministry of Economic Affairs, 2016)
(2) Cooperation across rural actors	Landcare Germany Wasserschutzbrot
(3) Joint implementation of AEMs with advisory support	Kooperationsmodell Trinkwasserschutz in DE Reef Rescue Program (Australia)
(4) Awareness raising components such as ecological championships	Species rich grassland programme (Flowering Meadows Scheme: HERBE_07 National Rural Network Biodiversity Farmer of the Year Award
(5) Differentiation of different ecologic qualities	Species rich grassland (Artenreiches Grünland - Kennarten) RBAPS Arable Pilot in the UK Grassland bird protection payments Conservation performance payments
(6) Combined payments across different levels	Performance-based Environmental Policies for Agriculture Initiative (PEPA) Ordinance for Ecological Quality in Switzerland
(7) Competitive bidding (auction approach)	Conservation Auctions in Ohio EcoTender Bush Tender
(8) Cooperation of farmers with nature protection authorities in implementation and administration	PFEIL – Agri-environmental programme Lower Saxony Kooperationsmodell Trinkwasserschutz in Germany
(9) Involvement of farmers in monitoring	MEKA programme Species rich grassland programme (Flowering Meadows Scheme: HERBE_07) Austrian “Oekopunkte” Programme

Source: Own figure.

4.2 Innovative elements in scheme design and eligibility criteria

Good practice (key) element 1: Cooperative approach in AEMs

The scale of the application and the spatial targeting of AEMs are important key issues for the identification of good practices in scheme design. There is little consensus as to the optimum scale for managing different ecosystem services (Wood, 2010). However, agri-environmental contracts with individual farm managers face the challenge of delivering ecosystem service benefits at landscape, catchment or even wider scale. For example, farmland birds require a mix of habitats and the creation of habitat networks at a landscape scale, and a regional scale is appropriate in considering how to improve the resilience of habitats to climate change (Gimona et al, 2011). **Cooperative AEM contracts can address the delivery of environmental benefits across different scales**.

Facilitated through the option of group applications for agri-environment-climate measures in Regulation (EU) No 1305/2013, Article 28, the Dutch government decided to implement AEMs for joint applications only. Since 2016, individual applications are no longer possible (Ministry of Economic Affairs, 2016). The decision to implement mandatory cooperative applications was driven by four main reasons:

1. AEMs effectively achieving environmental objectives require a cross-farm approach.

2. Because of the dynamics of farmland biodiversity, there is a need for greater flexibility in terms of the content of conservation activities, their exact location and their financial compensation.

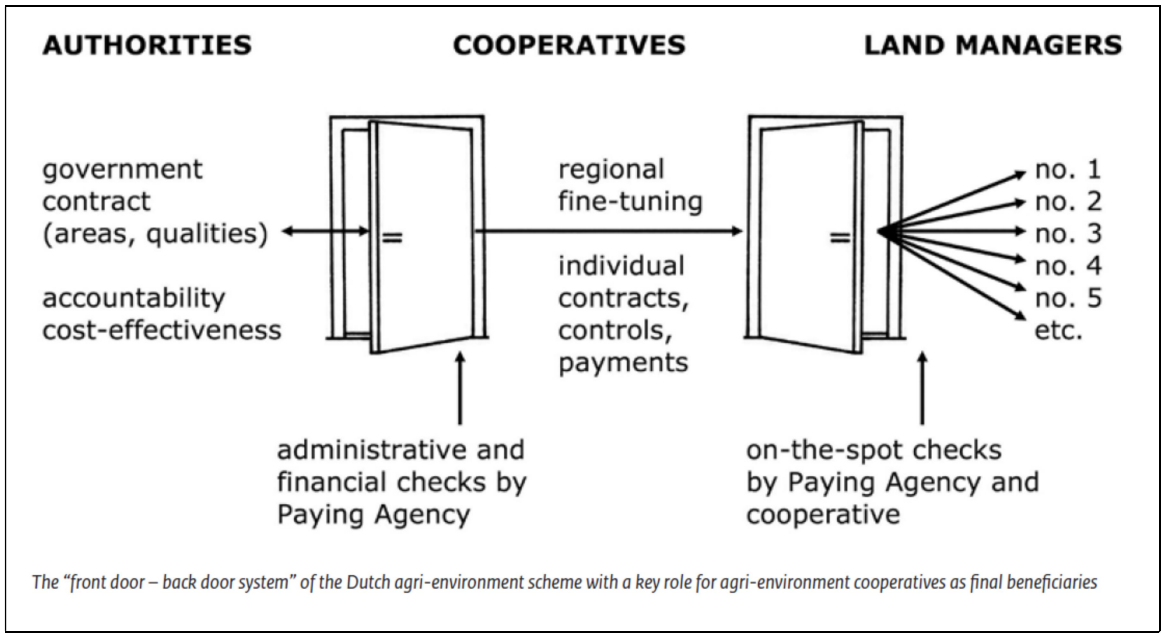
3. Previous individual scheme had a relatively high error rate. The cooperative approach makes it possible to both simplify the administrative processes and to improve scheme compliance.

4. The Netherlands has a long tradition of agri-environmental cooperatives, trusted by farmers and governments, and with the social structures already in place.

The new scheme design uses the so-called “front door – back door” principle. At the front door, the government signs a contract with the regional cooperative. This contract defines the agri-environmental targets and outlines the types of conservation activities that will be implemented to achieve these targets. It is a six years result-based agreement to achieve specific habitats on a specified land area at a budget per habitat based on the average payments per hectare for the different activities. At the back door, the cooperative sets up contracts with farmers. These contracts cover all the specific activities and payments needed at field level to achieve the

habitat at a landscape level. In addition, regional fine-tuning of conservation activities and payments is carried out between the government and the regional cooperative to ensure that the contracts address the specific regional context (Ministry of Economic Affairs, 2016)[4]. Figure 7 visualises the "front door – back door principle".

Figure 7: The Dutch "front door – back door" principle



Source: Ministry of Economic Affairs (2016).

The focus of the Dutch cooperative scheme is on improving habitat condition for rare species and water quality protection at a regional level instead of individual commitments at farm level. The scheme combines regional conservation plans (habitat/focus area) and local input through annual management plans for habitats coordinated by the cooperative. A coordinated cross-farm approach is more effective for species and habitats that exceed farm level (e.g. farmland birds, ecological corridors) and for reducing negative externalities to improve water, soil and air quality. The approach can also help connect protected areas such as Natura 2000 sites.

The cooperative approach can deliver biodiversity benefits in areas with large grassland parcels and few landscape elements, for example, by creating networks of parcels with different vegetation heights providing cover areas for ground breed-

[4] More details on the different tasks and responsibilities of the different key actors in the cooperative approach in the Netherlands can be found in the brochure on the background, procedures and legal and institutional implications of the approach published by the Ministry of Economic Affairs (2016).

ing birds. In areas with small parcel structures the cooperative approach facilitates the maintenance of the parcel structure and landscape elements with specifically coordinated contributions of each of the participating farmer. As a result, the landscape (of the small parcel structure) is seen as an added value both to biodiversity and farmers, who receive payments for the additional labour input.

But the cooperative approach does not come without challenges. The focus of European examples on site-specific single objective schemes reflects the complex nature of implementing cooperative schemes at catchment, landscape or regional level, e.g. with respect to monitoring and coordinating the delivery of results across sites and farms. The transformation of AEMs from individual farm contracts to contracts with cooperatives was possible in the Netherlands due to the long tradition of cooperatives. Experiences in the Netherlands also highlight the particular importance of a good coordinator for the successful implementation of measures across farms. As Davies et al. (2004) conclude, farmers are unlikely to identify the environmental benefits of cooperative action by themselves. They do not see it as their role, nor their area of expertise, to identify opportunities for collaborative environmental working. Dedicated coordinators of collective action need to be set up and funded to identify potential benefits.

Partnership initiatives and cooperative activities tend to build on existing informal social and information networks rather than generate entirely new networks. A possible implementation of pilot cooperative schemes should build on existing networks, if and where possible, for example building on past cooperation established in previous agri-environmental projects. Existing Landcare associations could be integrated in the governance of cooperative AEMs.

Good practice (key) element 2: Cooperation across rural actors

This good practice element addresses the engagement of different public, private and civil society actors to identify demand-driven ways of jointly delivering public and private goods and to coordinate support across different land and value chain levels. Species-rich grassland, hedgerows and meadow orchards can only be preserved if used and cared for continuously. An example for such good practice is the **Landcare Associations, which collaborate with local farmers for the management of such habitats with a high biodiversity value**. This contributes to the opportunity for farming businesses to diversify income and supports regional development.

The main purpose of the Landcare association in Germany (and other countries) is suitably summarised in a kind of vision statement of the Landcare Associations in Germany (2016): “Farmers, conservationists and representatives of the local communities who team up in Landcare Associations work on a voluntary basis and

share the same rights. Their close cooperation is the backbone for mutual understanding, trust and acceptance. These are the best possible conditions for implementing even complex measures."

The German Association for Landcare is the umbrella organization of at the moment 155 Landcare Associations (LCA) in Germany. These regional non-governmental associations link nature conservation groups with local farmers and local communities. These three groups are equally represented in the association. The often-opposing interest groups work together in LCAs voluntarily to care for the cultural landscape and traditional farming systems. Project coordinators also ensure the combination of traditional knowledge and new scientific results to foster farming practices and agri-environmental and rural development measures which improve a sustainable income to farmers and conserve the diverse mosaic of landscapes including its biodiversity benefits.

Key for the success of the projects is the close cooperation of farmers, local communities, conservation groups and government authorities. Local LCAs such as the LCA in the Black Forest have been widely promoted as good practice examples for successful landscape stewardship. The LCA projects generate economic benefit for farmers through the use of market approaches, encouraging people to buy locally from producers. This helps farmers to market their quality products like apple juice or lamb meat. Those products can be labelled "nature-conservation-products" because they were produced in an environment friendly and sustainable farming system. The initiation of regional marketing has increased the revenue of local farmers from sales on local markets. The benefit to the landowner is a more predictable market and, if local, lower costs in transportation and distribution. The cooperation of rural actors with local farmers has the potential to combine environmental and economic interests, and the provision of private and public goods.

Of particular relevance to biodiversity support schemes in Lithuania is the engagement of LCAs in networking biotopes. Many endangered species will only survive if they live in connected habitats. LCAs provide mosaics in the landscape by establishing corridors which they create or amplify in cooperation with farmers and communities, or by planting hedges and restoring natural stretches of water. It could be reviewed to what extent Lithuanian LCAs could play an active role in setting up cooperative pilot schemes.

Good practice (key) element 3: Joint implementation of AEMs with advisory support

The explored good practice elements will be new ideas to the majority of land managers in Lithuania. This may lead to rejection and misinterpretation of the agri-environmental innovations and resulting contracts. It is important to investigate

concerns early and to regularly engage with land managers. It is also important to use simple tools to communicate program intentions (Burns et al. 2016). **Providing high levels of advice and support to land managers participating in outcome-based AEMs is a key factor for the success of such a scheme** (Herzon et al., 2018). .Joint implementation of AEMs with advisory support can address these issues.

The Kooperationsmodell Trinkwasserschutz in Lower Saxony, Germany, includes voluntary agreements between the water company and the farmers to improve the quality of groundwater, specifically reducing nitrate levels and the amount of pesticide and sulfate pollutants (Matzdorf et al., 2014). The second important tool in this example is known as the supplementary water protection advisory service, which is free for farmers and financed through the Rural Development Programme.

Advisers are primarily agricultural engineers with many years of practical experience and are often members of the Chamber of Agriculture. The advisers have accompanied the project from the beginning and helped to develop it. As a result high levels of trust between the advisors and the farmers developed and the relationship of trust between farmers and the advisers has played a very important role in the success of the measure (see also key element 8). Similar positive experiences in terms of trust development were obtained in the Reef Rescue Program in Australia (Taylor and van Grieken, 2015).

Similarly new biodiversity support schemes could be jointly implemented with support for biodiversity advisory service. The advisory service would provide guidance and training on how to practically manage land to achieve the optimum habitat conditions which is critical in outcome-based AEMs. In cases where no specific biodiversity advisors exist, training and specific qualifications of existing advisory services are required.

Good practice (key) element 4: Awareness raising components such as ecological championships

Schemes with an outcome-based approach permit the land manager to innovate, thus, drawing on their experience and local knowledge to achieve better and more cost-effective results. Examples such as the 'Flowering Meadows Scheme' in France show that by making knowledge of how to improve conservation on farms important, result-based schemes create common goals between farmers and conservationists, leading to cooperation between two conflicting groups. **The recognition and sense of achievement can be further promoted through the organisation of championships** as in the case of the "Flowering Meadows" contracts in France. National championships of agri-ecological excellence raised the recognition of successful implementations and managements of outcome-based projects

amongst the farming and rural communities (NOC, 2011). The championships basically highlight that biodiversity conservation is not about obeying mandatory obligations or prescriptions but is the result of good farming (Oppermann et al., 2012). The majority of the meadows assessed in these championships obtained high scores both on agricultural and ecological values. De Sainte Marie (2014) concludes that the results demonstrated that species richness could be combined with a viable fodder production, thereby challenging the traditional paradigm which, for so long, has governed the relationship between naturalists and farmers.

Similarly, biodiversity awards for farmers have been introduced in Ireland. The National Rural Network Biodiversity Farmer of the Year Award recognises a farmer who is farming in a sustainable manner by encouraging biodiversity and protecting the environment. The aim of this new award is to raise awareness of the importance of biodiversity in the farming community. Agriculture relies on biodiversity in many ways: Bees pollinate crops, earthworms build soil fertility, bacteria and soil biota breakdown nutrients and birds and insects keep plant disease and pests in check (Irish National Rural Network, 2018).

Attracting wider public attention to the innovative nature of an AEM and to the important role of farmers in delivering biodiversity can serve as an additional reward instrument (Fleury et al., 2015). It may not essential for the scheme's instigation, but may increase long-term support in running and enlarging the scheme (Herzon et al., 2018).

4.3 Innovative elements in payment design

Good practice (key) element 5: Differentiation of different ecologic qualities

Transparency is a key issue for successful implementation and operation of agri-environmental measures. Outcome-based payments do not involve prescribing particular activities to farmers, but the transparency of outcome and its validation and measurement are important not only for farmers, but also in the context of justifying payments and international acceptability. A balance needs to be struck between allowing sufficient flexibility in the range of indicators being used and ensuring that they are specific enough to be used in assessing that objectives are being achieved. Herzon et al. (2018) group requirements into three main criteria:

- Not be easily achievable by means other than agricultural management,

- Be understandable and linked clearly to biodiversity objectives that are acceptable to land managers and paying agency representatives (i.e. not seen as 'bad farming"), and
- Be easily measurable following initial training.

Options for indicators range from the numbers of a single species to a composite indicator with species numbers and habitat attributes as in the case of the the Burren Farming Conservation Programme (see DAFF, 2010). A combination of indicators at different levels is required, if farm level and landscape level payments are to be combined within one scheme. An important aspect is to ensure that the indicator thresholds do not reward the deterioration of the most biodiverse sites. This can be prevented by having multiple indicator thresholds linked to different payment levels (Burton and Schwarz, 2013). Examples of different payment levels can be found in the semi-natural grassland payment in Lower Saxony (Germany) and other Federal States of the country, the RBAPS Arable Pilot in the UK, in payments per nest sites in the Grassland bird protection payments in Schleswig-Holstein (Germany) and individual animal (carnivore) in the Conservation Performance Payments in Sweden. **Using different thresholds also accounts for different contributions of individual farmers** participating in a cooperative scheme as described under key element 1.

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 is apparent from the variety of approaches used in the German grassland biodiversity schemes, experimentation is required to set the payment at an appropriate level that reflects the full cost of achieving the desired outcomes (including time spent on training and monitoring of ecological results). The participation risk for newcomers to the scheme can be reduced by setting relatively easy entry conditions with an increasing demand for a higher target and higher payments later (Schroeder et al., 2013).

In hybrid outcome-based schemes providing a bonus payment on top of a management-based payment, the payments are dependent on some management prescriptions that aim to maintain baseline conditions. Hybrid schemes may also be required because not all biodiversity aims can be practically measured through indicators. However, as Herzon et al., (2018) conclude, the owners of the sites with the highest biodiversity may still not receive a sufficient incentive for maintaining exceptional biodiversity, if the threshold reflects the average situation. Options to calculate payments vary from a single bonus payment for the results additional to

the baseline payment for management to an iterative process of auctioning (see also key element 7 for further information).

Good practice (key) element 6: Combined payments across different levels (e.g. parcel and biodiversity/habitat networks)

Whilst a focus at the plot, field or farm level may be sufficient to target some environmental goods and services, others **require a wider spatial perspective** which takes account of patterns as well as extent. These include habitats that encompass a mosaic of different land uses and features across a relatively large area, or landscapes. However, even smaller areas of habitats networks often tend to go beyond one farm. Consequently, the delivery of many biodiversity benefits depends on a landscape or catchment scale approach (Schwarz et al., 2008).

Combining payments at farm level with a bonus payment at landscape level, if a result - in this case a particular biodiversity outcome – is achieved at landscape level, is similar to the idea of an agglomeration bonus. Parkhurst et al. (2002) propose the use of an agglomeration bonus to address the issue of the spatial coordination problem in AEMs. The principle of this mechanism is that a land manager gets a payment for participating in an AEM, which is then topped-up with an additional payment if the enrolled plot is contiguous to a plot enrolled by another land manager. Similarly, a bonus payment can be used to achieve "a critical mass" of land managers signing up to an AEM increasing the chances of larger scale effects, e.g. at landscape scale or catchment scale.

Spatial coordination can be incentivised by bonus payments for a particular habitat network or catchment pattern (e.g. Ordinance for Ecological Quality in Switzerland (OECD, 2007)). Building on the experience of the Performance-based Environmental Policies for Agriculture Initiative (PEPA) in the US a second pilot scheme is analysed which, in addition to a farm level payment, provides a bonus payment at catchment level, if certain predefined in-stream thresholds of water quality are achieved (J. Winsten, pers. comm.). This provides a remuneration of collective efforts and results at catchment level.

In principle experiences with combined payments (or bonus payments at higher higher level) could be translated to biodiversity conservation schemes. **Payments for individual farms could be topped up by a bonus payment, if the establishment of ecologically valuable habitat networks has been achieved and landscape level biodiversity benefits achieved.** This, however, increases the complexity of the scheme. Suitable indicators at parcel level and habitat or landscape level are required and coordination efforts occur to ensure that the most appropriate parcels are included in the scheme (Schwarz et al., 2008).

Good practice (key) element 7: Competitive bidding (auction approach)

With the use of auctions land managers are invited to submit tenders specifying their proposed actions and cost (bid) levels, and a subsequent evaluation process identifies the biodiversity benefits involved and then the most cost effective proposals. Typically those bids offering the highest environmental benefit per unit cost are selected until the available funds are used up or some threshold rule is reached. It is basically an auction with a single buyer (e.g. the government agency) and many sellers (land managers) (Rolfe et al., 2017).

Land managers would be asked to tender for biodiversity projects as listed by Government. This would encourage a more targeted approach where farmers are viewed as potential providers of environmental services or outcomes which society wants to buy. The underlying logic is that society can achieve its environmental objectives at least cost because the most efficient providers of these services are awarded the contracts. The auction approach has been used in various schemes in Australia and the US (e.g. EcoTender (Australia), Bush Tender (Australia), Auction for Landscape Recovery (Australia), Conservation Auctions in Ohio, and the US Conservation Reserve Program). In Europe there is less experience with auctions in AEMs. Some pilots have been tested such as Klimek et al. (2008) and Latacz-Lohmann and Schilizzi, (2005).

Auctions can yield additional benefits in terms of both environmental outcome and cost-effectiveness (Schilizzi and Latacz-Lohmann. 2016) and can address issues of over- and under-compensation (Klimek at el., 2008). A suitable summary of the experiences with auctions is provided by Rolfe et al. (2017). Based on a review of more than 100 tender applications the authors conclude that tenders are robust, relatively simple to apply and deliver more cost-effective allocations of public funding than other grant mechanisms. The reasons for their limited use can be related more to political and bureaucratic forces and inertia rather than to economic and design limitations.

Although subject to some concerns over their repeated use, auctions offer a possible means of not only improving efficiency relative to the current use of flat-rate payments but also relaxing the WTO constraint on the basis for payment calculations. Auctions are acceptable under the EC Rural Development Regulation and bids can be interpreted as reflecting costs incurred and thus may permit to set a suitable payment level for an outcome-based approach. However, the setting of a public budget from which to fund a scheme and the identification of a maximum acceptable price to pay for a unit of a given public good requires a measure of demand to match the supply-side bid – and this implies recourse to some form of environmental valuation technique (Schwarz et al., 2008). In the context of a possible new bio-

diversity conservation scheme in Lithuania auctions could potentially be used to test payment levels and to get a better understanding of the "real" cost of land managers to deliver the desired outcomes.

4.4 Innovative elements in administration and monitoring

Good practice (key) element 8: Cooperation of farmers with nature protection authorities in implementation and administration

Evidence from the evaluation of AEMs in Lower Saxony (Germany) indicates that the cooperation between farmers and nature protection authorities can increase the area under biodiversity management and can improve the suitability of included areas for the creation of habitat networks (Sander, 2017). Similar experiences were generated in the "Kooperationsmodell Trinkwasserschutz" in Germany, where water protection advisors and the nature protection authority act as intermediaries (Matzdorf et al., 2014). The advisers are primarily agricultural engineers with many years of practical experience and are often members of the Chamber of Agriculture. They are familiar with the region, maintain contact and have developed a trusted close relationship with farmers and land management organizations. The Lower Saxony Water Management, Coastal Defence and Nature Conservation Agency is entrusted with the administration of processing and evaluating the operations.

The cooperation between farmers and the lower nature protection authorities is promoted through two types of measures, **support for qualification to establish specific agri-environmental advice and a bonus payment for farmers**. Farmers receive a bonus payment, if they cooperate with the lower nature protection authority in the selection of parcels (in terms of location and size) for the agri-environmental contracts. The bonus payment is justified with higher transaction cost.

The results of the evaluation carried out by Sander (2017) indicate, however, that the qualification support for specific agri-environmental advice was more important than the bonus payment. But in some cases, the bonus payment increased the willingness of farmers to meet and enter cooperation with the lower nature protection authorities. One option could be a temporary bonus payment in the early phase of a new biodiversity support measure to entice cooperation. The experience emphasises the importance of accompanying agri-environmental (biodiversity) advisory service being jointly provided with AEMs (see also under key element 3).

Key element 9: Involvement of farmers in monitoring

The responsibility for monitoring is an important aspect in the design of outcome-based payments and provides options to deal with additional monitoring efforts

required to measure the performance of participating farmers. In a number of existing outcome-based payments (or payments with outcome-based components) farmers are actively involved in the monitoring of the environmental outcome. Examples include the so called "MEKA" programme in Germany, the "Flowering Meadows" contracts in France, the Dutch Meadow Bird Agreement and the Austrian "Oekopunkte" Programme. Key issues in ensuring reliable results from the self-monitoring done by farmers are sufficient training provided to farmers beforehand, suitable and cost-effective monitoring strategies and the use of new technology where appropriate.

The involvement of farmers in the monitoring is good practice and valuable regardless of whether the managers are required to conduct their own verification of achieved ecological results, because it enables the assessment of one's performance and facilitates adaptive management (see, e.g., Russi et al., 2016). The involvement of certified experts and voluntary organisations (for example, environmental and community groups) – in addition to farmers – in the development and testing of monitoring approaches is identified as important for the scheme success (see, e.g., Fleury et al., 2015). Joint monitoring, in particular in the early years of an outcome-based payment, would allow farmers to discuss emerging issues with the expert during the monitoring. Experts and voluntary organisations can also provide training to farmers and can help to adjust the scheme in line with principles of adaptive co-management as illustrated by landscape stewardship initiatives in Europe (García-Martín et al., 2016).

Dispute can emerge over the results of the monitoring, e.g. if the monitoring result is under the required threshold. Herzon et al. (2018) argue that a robust system of dispute resolution (fair to both sides) helps to increase farmers' confidence in the outcome-based schemes. In Ireland, farmers are not only given training in the assessment that determines payment levels but also are encouraged to challenge the scores given by the independent assessors (Herzon et al., 2018)

Visual monitoring can help to reduce the resources required and can be conducted by the farmers themselves. The experience from the Dutch Meadow Birds Agreement shows that monitoring by farmers and volunteers seems to work well with easily identifiable indicators. Costs for the farmers associated with additional monitoring and training efforts could be incorporated into the calculation of payment rates by adding a transaction cost component. In the Dutch Cooperative different key species indicators are monitored collectively (birds and amphibians) to reduce cost and effort and drones are used to identify bird nests (Vala, 2018).

5 Lessons learnt

The scale of the application and the spatial targeting of AEMs are important key issues for the design of future biodiversity schemes in Lithuania. Agri-environmental contracts with individual farm managers are limited in delivering biodiversity benefits at landscape, catchment or even wider scale. Individual farm contracts are thus not adequate to address biodiversity concerns and some form of collective action and coordination is needed.

Spatial targeting, result-based design and long-term contracts improve the effectiveness of support instruments. Achieving the desired provision of biodiversity benefits requires spatial coordination of locally implemented collective action for land management. Cooperation and coordination is needed in the long-term to achieve outcomes both at parcel and landscape level.

A common success factor highlighted across many of the reviewed examples is the importance of close and trusting cooperation between land managers, administrations and other stakeholders from the start of the development phase of the scheme. This includes a joint assessment of the extent of the problem(s) the AEM shall address as well as the development of strategic objectives and the payment design. It does not only apply to cooperation between land managers and conservationists but also to cooperation at the administrative level. A jointly designed pilot scheme addressing the different concerns of the involved main stakeholders encourages buy-into the approach and fosters acceptance.

The key questions then become how a new pilot biodiversity scheme can be designed and implemented and what key issues need to be considered in the practical implementation. One of the main dilemmas which needs to be dealt with is that a new biodiversity scheme with too little change and risk (compared to previous AEMs) is unlikely to lead to the desired biodiversity improvements and outcome. But a scheme with too much change, or where the risk is too high, is likely to fail and won't be acceptable for farmers and administrations.

This requires a better understanding of the particular relevance of the identified good practice key elements in a Lithuanian context from the perspective of different key actors such as ministry administrations and environmental NGOs and land managers. A simple exercise has been conducted with key actors to define either a low or high priority for each key element, or to indicate that a particular element is not relevant at all. Preliminary results of this exercise indicate a high priority of at least 50% of the participating key actors for the following good practice elements:

- **Key element 1 Cooperative approach in AEMs**
- Key element 4 Awareness raising components such as ecological championships
- Key element 5 Differentiation of different ecologic qualities
- Key element 6 Combined payments across different levels
- Key element 8 Cooperation of farmers with nature protection authorities in implementation and administration
- **Key element 9 Involvement of farmers in monitoring**

Elements highlighted in bold were defined as high priority elements from all actors. The preliminary results suggest a focus on designing a pilot scheme which will be testing the coordinated implementation of an outcome-based biodiversity scheme on a group of farms and paying specific attention to options how farmers can be involved in the monitoring of the outcome. An outline of possible pilot scheme will be developed in the next phase of the project.

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