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Collaborative Governance Approaches Addressing Institutional Fit to Improve Success of Agri-environmental Programmes in Europe

Master Thesis in the Study Programme Agricultural Economics

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Abstract

European agricultural landscapes are characterised by interlinked ecological and social systems. Benefits from these ecological systems to humans are multi-faceted but require institutional structures that sustain ecosystem functions. However, agri-environmental programmes for nature conservation in these landscapes often lack in alignment with local ecosystems, resulting in problems of effectiveness and efficiency. This study focuses on collaborative approaches to agri-environmental programmes, which recently gained in attention in research but also politics. These local partnerships involving farmers, public authorities and civil society aim at coordination of measures at landscape-scale. By combining a literature review with own empirical research, it was possible to provide for a case study overview that reflects the variety of such arrangements in different European landscapes, next to gaining deeper understanding in functionality of collaborative initiatives from interviews conducted in Flanders and the Netherlands. For this in-depth analysis of design characteristics, a framework was developed that compiles economic and integrative concepts and helped to find key characteristics improving institutional fit and thus performance, compared to conventional programmes. Results highlight a participatory and holistic approach to programme design to achieve acceptance and responsibility. Flexibility, cooperation in implementation and monitoring, and a broad involvement of professional support stimulate motivation and learning. Moreover, a pressure to address a problem fosters collaboration, as well as an existing local network to build upon. The study further indicates challenges of agri-environmental collaboration that can be summarized to an adequate level of governmental intervention. Governments should facilitate funding, knowledge and legislative framework without overregulating local initiatives. If this balance succeeds, collaborative agri-environmental programmes bear capacities to continuously maintain ecosystem functions. Besides further research on network dynamics, long-term evaluation of outcomes is required to enable a better comparison to conventional programmes, as a basis for policies supporting collaboration.

Keywords: Social-ecological Systems, Payments for Ecosystem Services, multi-partner governance, institutional design characteristics, landscape management

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Contents

List of Figures

List of Tables

List of Abbreviations

ABC Eco²	Agrobeheercentrum Eco²
ABG	Agrobeheergroep
AEA	agri-environmental agreement at the landscape scale
AEP	agri-environmental programme/s
ANV	Agrarische Natuurvereinigingen
BOs	beheerovereenkomsten, part of Flemish AEP
cAEP	collaborative agri-environmental programme
CAP	Common Agricultural Policy
cf.	confer
EC	environmental cooperative
EDS	Ecosystem Dis-Services
e.g.	exampli gratia
ES	Ecosystem Services
et al.	et alii
EU	European Union
HDSR	Hooghemraadschap de Stichste Rijnlanden
ibid.	ibidem
LEADER	Liaison entre Actions de Développement de l'Économie Rurale
LIFE	L'Instrument Financier pour l'Environnement
MEA	Millennium Ecosystem Assessment
NGO	Non-governmental Organisation
NNN	Natuurnetwerk Nederland
NTS	National Trust for Scotland
OECD	Organisation for Economic Cooperation and Development
PES	Payments for Ecosystem Services
PNR	Parc Naturel Régional
RVO	Rijksdienst voor Ondernemend, Dutch Enterprise Agency
SES	Social-Ecological Systems
TCs	transaction costs
UNEP	United Nations Environment Programme
VLM	Vlaamse Landmaatschappij, Flemish Land Agency
VMM	Vlaamse Milieumaatschappij, Flemish Environmental Agency

1 Introduction

1.1 Agricultural Landscapes as Social-ecological Systems

Agricultural activities are embedded in social and ecological processes. Crops and agricultural incomes are influenced by weather conditions as well as agricultural policies, local associations, and markets. Ecosystems are directly influenced by agricultural activities, like nitrate application, and indirectly by regulating legislation. The interaction processes mentioned demonstrate the need for systemic thinking: in **social-ecological systems (SES)** which are characterized by interactions of social actors and institutions[1] within a certain biophysical unit forming dynamic networks of social and ecological processes that are interlinked and correspond to each other. The concept emphasizes the integration of humans in nature and the importance of multiple perspectives in analysis and management (BERKES et al. 2008). Most European landscapes are SES that are shaped by agricultural activities due to their close relation to natural assets. These **agricultural landscapes** both provide and rely on ecosystem services and biodiversity (ZHANG et al. 2007).

The anthropocentric concept of **Ecosystem Services (ES)** categorizes direct and indirect benefits from nature to humans and aims at facilitating complex decision processes related to the interaction between ecological and social systems. The Millennium Ecosystem Assessment (MEA) distinguishes four categories: *(1) Provisioning ES* are products obtained from ecosystems, like food or water. *(2) Regulating ES* are benefits from the regulation of ecosystem processes, e.g. waste decomposition or purification of water and air. *(3) Supporting ES* are regarded as the basis for production of all other ES. Examples are nutrient recycling and soil formation. *(4) Cultural ES* is a category for non-material benefits like recreation site, cultural and historical value (MEA 2005). Recently, the supporting function is often replaced by **biodiversity**. The Convention on Biological Diversity defined biodiversity as the number, variety and variability of all living organisms in ecosystems. It covers genetic diversity within populations as well as diversity of species and ecosystems (UNEP 1992). Biodiversity is highly important for stabilization of the natural system through adaptation and is thus regarded as the basis for ES (MATZDORF et al. 2014).

[1] Institutions are understood as conventions, norms and formally sanctioned rules within a society providing human coordination (VATN 2016).

Agricultural activities primarily optimize provisioning services of marketable goods like crops, milk, or fuels while depending on supporting and regulating ES, such as soil fertility and pollination. Furthermore, the farmers' management enable the provision of **non-marketed services** like habitats for certain species or aesthetic landscape (ZHANG et al. 2007). These are depicted separately in Figure 1 due to their characteristics of **public goods**: they are non-excludable and non-rivalrous, e.g. all people can enjoy the landscape shaped by agriculture[2]. Moreover, they can be described as positive externalities because they create benefits to others who did not choose to incur that benefit (OECD 2013). They are often not taken into consideration by the decision maker, e.g. the farmer, who focus on marketable goods. ZHANG et al. (2007) also refer to **ecosystem dis-services (EDS)** originating from agricultural activities, like nutrient runoff or habitat loss. These can also be described as **negative externalities** because they create costs to others who did not choose to incur that cost.

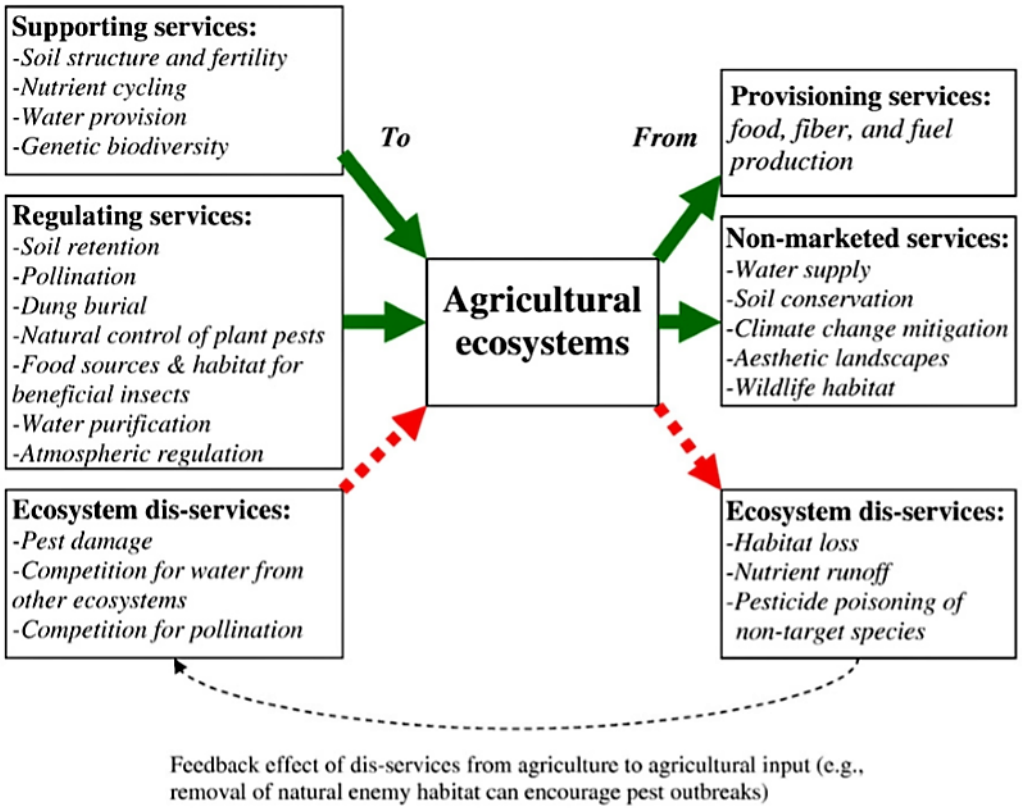

Figure 1: Flows of ES and EDS in Agricultural Landscapes (adapted from ZHANG et al. (2007)).

[2] There is a distinction between the pure public goods described and common-pool resources which are rival but lack of exclusionary systems, like water supply, and are therefore detected to overexploitation (OECD 2013).

The flows of ES and EDS often overlap. While agriculture is increasingly intensified to provide marketable services, the provision of non-marketed services is often prevented. "*Agricultural intensification, for instance, results in increased mechanization, more frequent mowing, increasing livestock densities, the removal of landscape elements such as hedges and hedgerows, lowering of groundwater levels, intensified nitrogen and phosphorus emission and deposition, and intensified use of pesticides. These developments in turn contribute to disturbance, loss of habitat, and eventually loss in flora and fauna*." (RUNHAAR et al. 2016, p.264). Furthermore, Figure 1 shows the importance to mitigate EDS from agriculture due to **feedback-effects** in long-term. But the problem with public goods and externalities is the **absence of economic incentives**. Public goods are likely to be undersupplied, because those who provide them are not adequately paid for the benefits they supply to others (OECD 2013). Since nobody can be excluded from enjoying landscape, individual consumers are not willing to pay for it (Free-rider problem). Negative externalities, in turn, are likely to be overproduced since they are related to marketable outputs for which an incentive exists (ibid.). Therefore, agri-environmental policy instruments are of increasing importance with growing awareness of issues like loss of biodiversity and climate change.

1.2 Performance of Agri-environmental Programmes

In the EU, the Common Agricultural Policy (CAP) target environmental problems through several instruments. Greening and cross-compliance are mandatory rules for all farmers who receive direct support within the first pillar requiring them to comply with relevant environmental legislation. **Agri-environmental programmes (AEP)** under the second pillar of the CAP are incentive-based instruments providing payments to farmers for voluntary environmental commitments (UTHES and MATZDORF 2013). Farmers who temporally adopt predefined practices from a 'menu of measures' receive governmental compensation for additional costs and loss of income (MEYER et al. 2015). Examples are reduction of pesticide application rates, or habitat measures such as delayed mowing. AEP are financed through the second pillar, the Rural Development Programme, and additional national contributions. The EU imposes basic institutional requirements[3] for AEP and provides co-financing of 2,5 billion euro per year, whereas member states are responsible for implementation (UTHES and MATZDORF 2013, WESTERINK et al. 2017b).

[3] For instance, implementation of the Water Framework Directive and Habitats Directive.

The **performance of AEP** has been investigated in a range of studies focusing on different AEP and using different indicators. KLEIJN and SUTHERLAND (2003) reviewed studies on AEP outcomes across Europe and found that a positive biodiversity response was reported in only 54 percent of the cases while the European continent faces an overall decline in biodiversity. This trend was confirmed in a study by KLEIJN et al. (2006) stating marginal to moderately positive effects on biodiversity in five EU countries. Especially for intensively farmed regions, less successful results were reported suggesting that more conservation efforts are required. Another survey of existing literature by UTHES and MATZDORF (2013) also summarizes a patchy success of AEP in delivering ecological effects. Problems with effectiveness, among others, result in decreasing efficiency of AEP. Several authors refer to indices that high public and private costs not corresponding to environmental effects decrease acceptance and uptake of AEP (METTEPENNINGEN et al. 2011, FRANKS 2011).

Some **problems in scheme design** stressed by UTHES and MATZDORF (2013) are time lags between actions and impacts, unintended effects due to insufficient knowledge on causes of environmental problems, as well as trade-offs between different ecological objectives, e.g. if the time of tree cuts overlaps with the breeding period of field birds. These problems are often associated with the horizontal character of AEP neglecting site-specific issues (UTHES et al. 2010). Other problems originate from **insufficient participation**. Regarding farmers' acceptance of AEP, it is important that they might adopt practices inaccurately, if they are not fully convinced, or refuse to participate at all. Acceptance limiting factors are management restrictions, a lack of policy coordination or the attitude of farmers regarding environment and bureaucracy (UTHES and MATZDORF 2013). Another reason for insufficient participation is financial constraints. Application on AEP often correlates with farm size since bigger farms can easily afford to enrol land in these contracts due to economies of scale (FALCONER 2000).

1.3 Collaborative Governance Addressing Institutional Misfit

Problems in design of AEP require an institutional analysis considering the complexity and dynamic of SES. Several authors point out that environmental problems in societies arise due to a **misfit** between the scales of ecological processes and institutions responsible for managing them. They may be arranged in such a way that one or more functions of the SES are disrupted, or inefficiencies occur (CASH et al. 2006, CUMMING

et al. 2006). Specifically, a problem of fit in space or in time involving human institutions and the biophysical scale of the resource, are best examined dimensions of misfit (YOUNG 2002). Considering AEP, a **spatial misfit** is identified in that prescribed measures often not provide for the locally optimal option. Most importantly, the level of action is the farm scale, whereas most ES require management at the landscape scale (PRAGER et al. 2012). Landscape elements, such as buffer sites along streams or ecological corridors, require spatial coordination of measures across farm holdings (WESTERINK et al. 2017b). A **temporal misfit** is identified in the contract length of six years which prevents from continuity in measures to achieve sustainable ecological effects (UTHES and MATZDORF 2013). In addition, the time for adaptations in design, since AEP are developed and revised in a complex and bureaucratic process, might not correspond to environmental developments requiring immediate changes (ibid.). Thus, limited **effectiveness** and **efficiency** of AEP result from an institutional misfit.

Consequently, institutional changes are to be considered. On a policy level, in the light of conflicts and mistrust between farmers, nature conservationists, and public authorities, it is contested how to improve the performance of AEP along with a high level of agreement in private sector and civil society (SCHOMERS et al. 2015). One approach is **collaborative governance** which gained in attention in natural resource management since it aims at partnerships between actors from all spheres of society: state, market and civil society (VATN 2016). A better adjustment of management on local conditions, local coordination and enhanced motivation could lower costs and increase environmental effectiveness (FOLKE et al. 2005, PRAGER et al. 2012, SCHOMERS et al. 2015). Latest research on alternative governance for AEP focused on collaborative initiatives throughout Europe, which emerged since the 1990ies. **Collaborative approaches to AEP (cAEP)** are local groups of farmers, public authorities, and actors from civil society aiming at coordination of environmental management. The contracting of farmers is locally organised and strives for simplicity, flexibility, and the resolution of conflicts (PRAGER 2015a; 2015b). Most recent, the **EU introduced an option for group applications** to AEP recognizing effectiveness of collaborative approaches[4]. In the Netherlands, collaborative groups are established nation-wide and form an integral part of the agri-environmental policy (RUNHAAR et al. 2016). Other countries have regional collaborative initiatives (e.g. BOULTON et al. 2013, TODERI et al. 2017).

[4] See Regulation (EU) No 1305/2013, article 28, sub-clause 2.

1.4 Research Approach and Aims

This master thesis is affiliated in a research project lead by the Leibniz Centre for Agricultural Landscape Research (ZALF). The project title is 'Civil-Public-Private-Partnerships (cp^3): Collaborative governance approaches for policy innovation to enhance biodiversity and ecosystem services delivery in agricultural landscapes'. Within this frame, the master thesis focuses on collaborative approaches to AEP. These are embedded in a regional or local context and differ throughout Europe, as existing case studies show. Since a broad emergence of collaborative initiatives is relatively new in this field, scientific literature and case studies differ in their methodology and intent. A lacking common definition to distinguish from other governance arrangements and few case study overviews represent the **state-of-the-art in literature**. A synthesis of EU-wide insights is, for instance, provided by PRAGER et al. (2012), PRAGER (2015a), and WESTERINK et al. (2017b), emphasizing opportunities but also indicating challenges of cAEP. To date, there is a lack of evidence whether collaborative approaches are generally more successful than conventional AEP. For a systematic comparison, more research on characteristics linked to long-term monitored outcomes is required.

The focus of this master thesis is on **characteristics of collaborative AEP** as opposed to conventional AEP. Since a detailed analysis of outcomes is outside the scope of this study, the aim is to investigate in how far collaborative approaches mitigate institutional misfit of AEP and thus improve their performance. An analysis of design characteristics is based on a **combination of literature review and own empirical research**. The two-step approach aims to provide both broadness and deepness of information. Previous sighting of literature considers collaborative initiatives using the group option of the CAP, as well as initiatives with a different funding source and a project character. For this study, collaborative AEP include all initiatives targeting agri-environmental management in a collaborative way due to insufficiencies of conventional AEP. Hence, the first step is to **provide for a case study overview** showing the spectrum of arrangements in cAEP while accounting for different regions, farming systems, and ES targeted. The overview indicates the potential of such approaches in different contexts and classifies them according to terminology and concepts presented in theory. The second step is a **deeper analysis** of case studies **based on qualitative interviews** following the research question:

Which design characteristics of cAEP improve institutional fit and thus increase effectiveness and efficiency?

BHATTACHERJEE (2012) highlights the advantage of case study examination in supporting theory building and, particularly, in understanding complex interrelations, because a variety of factors may not be known in advance. However, a **positivist method** is chosen which **tests hypotheses** on design characteristics derived from theory available at this stage. This is a deductive approach in contrast to the inductive approach of starting with data and deriving a theory from what was observed (ibid.). Accordingly, implications from case studies based on literature incorporate the hypotheses on design characteristics and additional case studies based on interviews are chosen to test the hypotheses. The advantage of empirical case studies providing for new aspects, however, remains. By contrast with the overview, all empirical case studies are in intensively farmed regions showing the potential of cAEP in a more **conflictual context**.

This study proceeds with Chapter 2 explaining **theoretical foundations** on governance before approaching a definition of collaborative governance and, specifically, cAEP, as far as provided in literature at the current state. The chapter continues with the **analytical framework** of this study: first, the derivation of hypotheses on design characteristics, as the step of structuring available literature for the analysis of own empirical data, and second, considerations on testing the hypotheses. Chapter 3 explains the **methodological approach** before Chapter 4 presents the **results**, which are divided into two parts. The results from previous literature review are presented in an overview of single case studies found. Thereafter, empirical results from own case studies are provided in detail. A **discussion** of results with respect to the hypotheses and a reflection on methodological limitations follows in Chapter 5. Finally, the **conclusion** in Chapter 6 summarizes the findings of this study and their implications.

2 Theory and Analytical Framework

2.1 Underlying Theories of Governance

2.1.1 Governance: Actors, Structures and Transaction Costs

Governance is a concept of processes and structures that steer public and private activities. VATN (2016) defines **governance processes** as shaping of priorities, acknowledging and possibly resolving conflicts, and realizing human coordination. For example, environmental governance on the use, management, and protection of environmental resources and processes is a conflictual field deciding, among other, about using land for farming, building activities, or nature protection. Governance occurs at different levels from global environmental agreements to national parliaments to community-based organisations. The processes are organised by **governance structures,** which are shaped by **actor constellations** and decision-making procedures. Property and use rights that define access to benefit streams from a resource are of fundamental importance, as well as rules concerning interactions. These can be the formal and informal rules governing the economic process, the political process, and institutions of civil society. Actors involved in governance, and their motivations, are divided into three groups: economic actors owning or using productive resources, political actors defining property or use rights and interaction rules, and civil society actors offering legitimacy to political actors (VATN 2016).

Economic actors are producers, to which should be focused here, and consumers. Production based on private property, e.g. firms, typically serve the owners' interest by maximising profits and accumulating capital. However, VATN (2016) points out that in smaller firms or units of household-based production, e.g. farms, aspects of lifestyle and reciprocity are equal motivations. Production can also be based on public property including wider goals, e.g. firms running railways or forests, or the state delivering public property like schools or health care systems. Finally, production can be based on common property, e.g. households sharing the management of a pasture. Common property organizations aim at balancing interests, and responsibility for the common resource may create social cohesion (OSTROM 1990, VATN 2016).

Political actors are public authorities and international governmental organisations, like World Trade Organisation or World Bank, and have the power to decide on rules at different levels of societies. In the context of AEP, political actors at EU- and national level decide on the design while pursuing different objectives. In the pluralist perception

of the state, politics is a market in which political actors compete for power and undertake bargains with other actors, based on interests they represent. However, the institutional perception adds that interests and positions of political actors are socially constructed and may be changed through the political process by learning and deliberation (MARCH and OLSEN 1995 in VATN 2016, p.148).

Civil society actors are very different, ranging from individuals to political parties, but generally strive for a well-being of (groups of) citizens. According to VATN (2016), they form the normative basis for a society, which develops in organized and inorganized ways. NGOs represent a variety of voices and can be a channel of participation in the democratic process. An example is participation of nature-related NGOs in the revision process of the CAP. VATN (2016) further mentions a trend towards civil expert organizations and think tanks. But in general, knowledge building is specialised in the form of research in universities and institutes characterized by the capacity for independent thinking and critical reflection on developments in society. Moreover, mass media are actors of civil society, as well as political parties and organizations representing business, like farmers' associations.

Actor constellations and decision-making procedures form a variety of **governance structures**. There are three ideal types of structures: hierarchies, markets and community management. VATN (2010) describes **hierarchies** as a system of command, whereas markets are a system of voluntary exchange. In hierarchies, the decision power is top-down, based on contractual relationships. This is an advantage in reducing costs of coordination, but there are higher costs of controlling because individuals' incentives to commitment are restricted. In ideal **markets**, the decision power rests with each participating agent, determined by the largest willingness-to-pay. However, in practice, formally equal parties have different capacities to pay (ibid.). But in comparison to hierarchies, markets have an advantage in providing individual incentives due to autonomous decisions and competition. The third type, **community management**, has neither a market nor a hierarchical character. Cooperation is a key element in decision-making, but relations are rather informal and often based on norms and reciprocity (VATN 2016). Hence, the functionality of community management in its ideal form is restricted to a relatively small number of actors. Although governance strategies often adopt an approach based on one type, in fact, there are mostly hybrid structures that incorporate advantageous elements of the ideal types (VATN 2010; 2016). These overlaps are depicted in Figure 2 classifying conventional AEP as a hybrid form of hierarchies and markets.

Figure 2: AEP as Hybrids of Hierarchies and Markets (based on MATZDORF et al. (2013)).

Different governance structures deal with different transactions at low transaction costs. The emergence of **transaction costs (TCs)** can be explained by the necessity of actors to coordinate for production or consumption activities. There are different types of TCs: Search and information costs, negotiation and decision-making costs, monitoring- and enforcement costs, and adjustment costs (FURUBOTN and RICHTER 2005). They depend on the behaviour of actors, attributes of the transaction, governance structure, and institutional environment. Attributes ascribed to transactions are asset specificity, uncertainty, and frequency. **Asset specificity** refers to the amount of transaction-specific investments like technology or know-how. When high investments are necessary, hierarchies operate best due to efficient information gathering and coordination opportunities, e.g. a firm specialised on the operation of wind farms. **Uncertainty** can exist concerning the future state of nature or behaviour of the contracting partner. Market governance is most efficient if uncertainty and asset specificity is low. In this case, individual incentives are not inhibited because costs of information and risks are low. Finally, the attribute of **frequency** refers to the advantage of decreasing TCs if similar transactions repeat over time (FURUBOTN and RICHTER 2005).

As indicated before, ES are provided by complex ecosystems which are governed by complex social systems. Hence, transactions have a considerable degree of specificity and uncertainty. Governmental action to mitigate environmental problems through legal regulations or economic incentives has historically been the dominant strategy. However, it is criticized for being slow and delivering weak results (VATN 2016). Hierarchical organizations tend to separate complex problems treated by specialized competencies. This sometimes leads to inflexible policies being detached from the needs of people.

Moreover, there can be problems with transparency (ibid.). Resulting attempts to **change governance structures** concern an increase of market mechanisms or community management. Some developments **towards markets** are privatizing water services, carbon trading systems, or certification schemes. In theory, they are more efficient because service delivery is based on the individual willingness-to-pay. But in practice these structures often failed in turning a complex and adaptive natural system into tradable commodities (VATN 2016). MURADIAN and RIVAL (2012) state that pure market structures are least effective in provision of ES due to high TCs required for coordination.

By contrast, the approach to **enhance community management** aims at participation, communication, and cooperation between multiple actors in a network structure (VATN 2016). This strategy was major influenced by research of Elinor Ostrom who found that common pool resources are often successfully managed by local collective action (self-governance). Thereby, bottom-up development of diverse institutional arrangements to overcome self-interested behaviour occurs in view of conflicts and resource exhaustion. Ostrom showed that the 'tragedy of the commons', which is automatic depletion of common resources due to absence of market incentives, does not necessarily occur and developed design principles for community management of common pool resources (OSTROM 1990). VATN (2016) highlights the advantage of a broad legitimate basis resulting from the development of a common understanding, although this approach tends to be slow at changing actions.

2.1.2 Payments for Ecosystem Services and AEP

The governance structure of AEP is a hybrid form and can be attached to the concept of **Payments for ecosystem services (PES)**. The concept emerged in the context of a rising attention to market governance and is related to the ES approach, which is characterized by the attachment of a social and economic value to nature (MATZDORF et al. 2014). The idea behind is that this value expresses the demand on a specific ES by describing its beneficiaries' willingness to pay for it, when benefits from the ES decline. In this case, the willingness to pay rises and results in private negotiations for a continued provision of an ES (ibid.). In this ideal solution, known as the **Coase-theorem**, it is a precondition to define those who benefit from the ES and those who supply it. A solution is only possible, if property rights are well defined (VATN 2010). An example is the ES of pollination negatively affected by the application of pesticides that harm bees. Regarding

property rights, it is to determine whether farmers have the initial right to use pesticides. Either farmers must buy the right to use them from society (polluter-pays-principle) or farmers are paid to refrain from their use (**provider-gets-principle**). The latter is reflected in a definition of PES in MATZDORF et al. (2014, p.12): "*Land users are paid (…) for reducing allowable negative external effects on ES or for taking action to preserve or restore ES and biodiversity*". Ideally, those who are paid have an interest to opt for appropriate and efficient solutions. Thus, the form of payment would rather be output-based, in contrast to input-based payments like a premium for a measure (ibid.).

In practice, privately negotiated PES rarely occur due to the complexity of social-ecological systems. Instead, PES appear as varieties of hybrid governance structures. The absence of **transaction costs** is a basic assumption of the Coase-theorem, but in fact, a lack of information available, environmental awareness, and attitude towards risk, prevent from initiating a private negotiation (VATN 2010, MATZDORF et al. 2014). However, **intermediaries** function as players who support the emergence of PES by mediating between service providers and beneficiaries. Intermediaries are stakeholders who have ecological expertise, specific information or contacts and who are trusted by the future contracting parties. For ES, it is often difficult to identify the buyers due to free-riding-behaviour. Thus, **governments** play an important role in establishing PES by pursuing general interest objectives and acting as a buyer on behalf of its citizens. Due to this function as a financier it is also a form of intermediary (MATZDORF et al. 2014, SCHOMERS et al. 2015, VATN 2016).

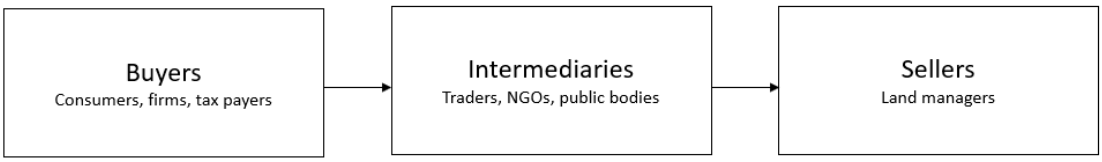

Figure 3: The Structure of Actors Involved in PES (adapted from VATN (2016)).

Although a market model is the idea behind PES, the dominant format is that of public payments based on taxes and fees – by command instead of trade (VATN 2010; 2016, SCHOMERS et al. 2015). Moreover, PES based on public payments are often a supplement to regulatory legislation (MATZDORF et al. 2014). Considering AEP, cross compliance regulations determine a standard for agricultural practices below which the polluter-pays principle applies. Above this standard, farmers are paid for additional efforts (UTHES and

MATZDORF 2013). MATZDORF et al. (2014) classify **AEP as a PES type** of voluntary governmental payments for voluntary actions. Thereby, government acts as a buyer and finances the provision of ES through programmes applying the provider-gets principle. However, **hierarchical elements**, besides the origin of funding, relate to environmental objectives and input-based payments (SCHOMERS et al. 2015). The measures required are primarily prescribed and farmers have no opportunity for negotiation. Therefore, AEP are often described as 'take-it-or-leave-it' contracts (METTEPENNINGEN et al. 2009, MEYER et al. 2015).

2.1.3 Performance of AEP from a Transaction Cost Perspective

Problems of AEP in scheme design and insufficient participation resulting in deficient ecological outcomes were introduced in Chapter 1. Relating these outcomes to high costs of designing and running AEP raises doubts on its **efficiency**. METTEPENNINGEN et al. (2011, p.642) describe AEP as a "*contractual mechanism for the transaction of environmental goods and services between the farmer, as a seller, and society, represented by the public authorities, as buyer*". Thus, efficiency depends on private TCs borne by the farmer and public TCs borne by the government.

METTEPENNINGEN et al. (2011) identify factors influencing high **public transaction costs** in AEP. First, the number and heterogeneity of actors involved is considered. The more farmers differ, the higher public TCs are to design a horizontal programme. Second, behavioural issues are considered. Trust could reduce costs of monitoring and control but barely plays a role in large programmes. Compliance is mainly influenced by farmers' attitudes and understanding of the programme. Concerning the attributes of transactions, it is important to which degree AEP are targeted towards site-specific environmental problems (asset specificity). There is a trade-off between public costs of designing spatially targeted programmes and environmental effectiveness. Another attribute is an **information asymmetry** between farmers and the government. Compliance cannot be fully controlled which results in uncertainty regarding outcomes of the transaction. Furthermore, an important factor is the institutional environment of AEP. The higher the number of different parties involved in the design process, the higher public TCs are due to conflicting opinions (METTEPENNINGEN et al. 2011).

Private transaction costs in AEP are described by METTEPENNINGEN et al. (2009). First, there are search costs which comprise gathering information on AEP and comparing

alternative options. Decision-making costs involve choosing a measure, or a set of measures, and the field on which to apply them, as well as comparing the compensation payment to expected costs. Both search and decision-making costs depend on experience of the farmer with AEP, trust in the government, provision of advice and education, and whether a specific investment is required. Negotiation costs can be ascribed to administrative costs of application, though a real negotiation on contract terms is absent in 'take-it-or-leave-it' contracts. Finally, monitoring costs for the farmer occur with keeping fertilisation records or accompanying the control agency to the fields (METTEPENNINGEN et al. 2009). The lacking continuance in AEP prevents from cost reduction through frequency of transactions. Several authors highlight that private TCs are not be underestimated since they have a **significant effect on participation** in AEP. Considering that farmers tend to be averse to administration, their perception of private TCs is important, regardless of real measurable TCs. The authors therefore opt for simplification of programmes and contracts (METTEPENNINGEN et al. 2009, FALCONER 2000, FRANKS 2011).

2.1.4 Institutional Misfit Decreasing the Performance

Effectiveness and efficiency determine performance of AEP and are addressed in the revision process of the CAP through adaptations on the measures or application procedure. However, from an SES-perspective it is required to tackle the cause of the problem by asking whether the institutions are well aligned with ecosystems they govern. **Scale** is important in dealing with complex systems that comprise many subsystems, e.g. a small watershed being part of a larger watershed (BERKES et al. 2008). Problems in managing natural resources often arise due to a **misfit** between the scales of ecological processes and institutions responsible for managing them (CUMMING et al. 2006, YOUNG 2002). Specifically, a problem of fit in space or in time involving human institutions and the biophysical scale of the resource are examined dimensions of misfit (CASH et al. 2006, YOUNG 2002). Another type of misfit can occur at the functional scale (VATN and VEDELD 2012). It concerns failure of institutions to account for social and ecological interdependencies affecting functionality of ecosystems and is associated with gaps in governance (EKSTROM and YOUNG 2009). In addition to scale, **interplay** is another (overlapping) aspect of misfit referring to problems when institutional arrangements negatively affect results of related arrangements at other scales (VATN and VEDELD 2012).

A **spatial misfit** occurs, e.g. if the scale of social organisation is too small for global environmental problems such as regulating carbon emissions and managing oceanic fisheries. In turn, global conventions or national regulations targeting the average location can have unfortunate impacts at local scales that differ from the mean (CUMMING et al. 2006, BERKES et al. 2008). MOSS (2004) exemplifies a spatial misfit between River Basin Districts and political territories of water management occurred with implementation of the EU Water Frame Directive at national level. CASH et al. (2006) mention large-scale scientific knowledge that has little relevance to local decision makers, e.g. global climate models being useless to subnational decision making, or local or indigenous knowledge being neglected in international treaties on fisheries. A **temporal misfit** occurs, e.g. if the management of long-lived and slowly reproducing species require consistent long-term policies that are difficult to achieve over relatively short electoral periods. In turn, large bureaucracies may take time to deal with ecological changes that demand immediate action (CUMMING et al. 2006, YOUNG 2002). A **functional misfit** occurs, e.g. if a city grows beyond the ability of the ecosystem to provide it with fresh water (CUMMING et al. 2006). This problem of scale is the most overlapping with problems of interplay. Hence, with problems of institutional fit, interactions and interdependencies among and between social and ecological systems are in the focus. Figure 4 represents a SES as a network, visualizing these interactions and interdependencies (A). One can think of a simple example of institutional fit if two actors, who profit from the same resource, are interacting to coordinate its use (B).

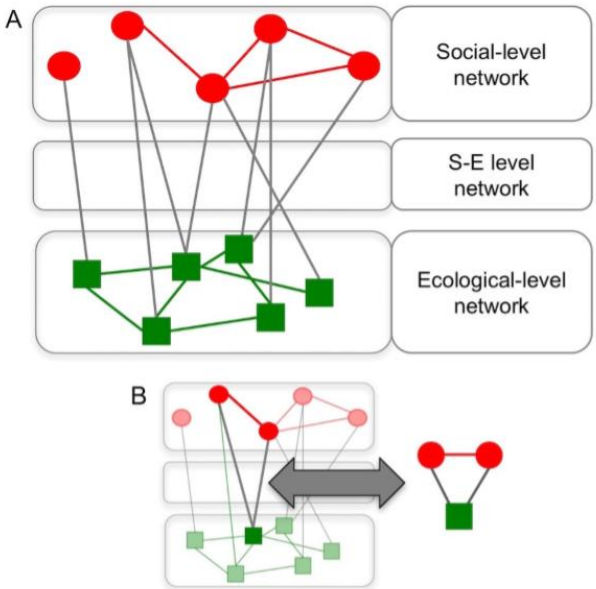

Figure 4: A Social-ecological System Represented as a Network (adapted from BARNES et al. (2017)).

An institutional misfit can **decouple costs and benefits of ES** (CUMMING et al. 2006, GUERRERO et al. 2015). Therefore, considerations on effectiveness and efficiency of AEP suggest such a misfit at the cause of the problem. For example, a spatial misfit is identified in that the level of implementation is the farm level, whereas ecological improvements occur at a landscape scale (PRAGER et al. 2012). A temporal misfit is identified in the contract length of AEP which may be too short to achieve sustainable ecological effects (UTHES and MATZDORF 2013). A further reflection on examples undermining a misfit of AEP is provided along with the introduction of hypotheses in Chapter 2.2. What is important is that the concept of misfit as an explanation for deficient effectiveness and efficiency of AEP raises the attention for changes in governance. One approach assumed to mitigate institutional misfit is **collaborative governance** because it aims at interaction between stakeholders from all spheres of society and from multiple scales (local, regional, and national) (BODIN et al. 2016). This approach gained in attention in different sectors, including management of schools, public health, planning, and natural resource management (ANSELL and GASH 2007).

2.1.5 Collaborative Governance Approaches

In environmental policy, a **shift from government to governance** is observable for the last decades. DRIESSEN et al. (2012) refer to acknowledges that the public sector is not the only controlling actor. There is a rising attention on interactions between societal actors: state, market, and civil society. "*The emergence of these hybrid forms of environmental governance is based upon the recognition that no single agent possesses the capabilities to address the multiple facets, interdependencies and scales of environmental problems that may appear at first sight to be quite simple*" (LEMOS and AGRAWAL 2009, p.79). Different types of **hybrid governance structures** are illustrated in Figure 5. However, these hybrid forms also have limitations. For example, public-private partnerships may face a democratic deficit and increase rates of extraction of natural resources (VATN 2016). In this study, a focus lies on 'multi-partner governance' including all spheres of society. This form neither neglects the markets' strength to mobilise human incentives nor the deployment of solidly united relationships and local knowledge embodied in communities, while the state still plays a significant role in coordinating and authorising actions (LEMOS and AGRAWAL 2009). Other terms related to this arrangement

are ‘interactive governance’ or ‘multi-level governance’ emphasizing the need for co-ordination between all actors at various levels (DRIESSEN et al. 2012).

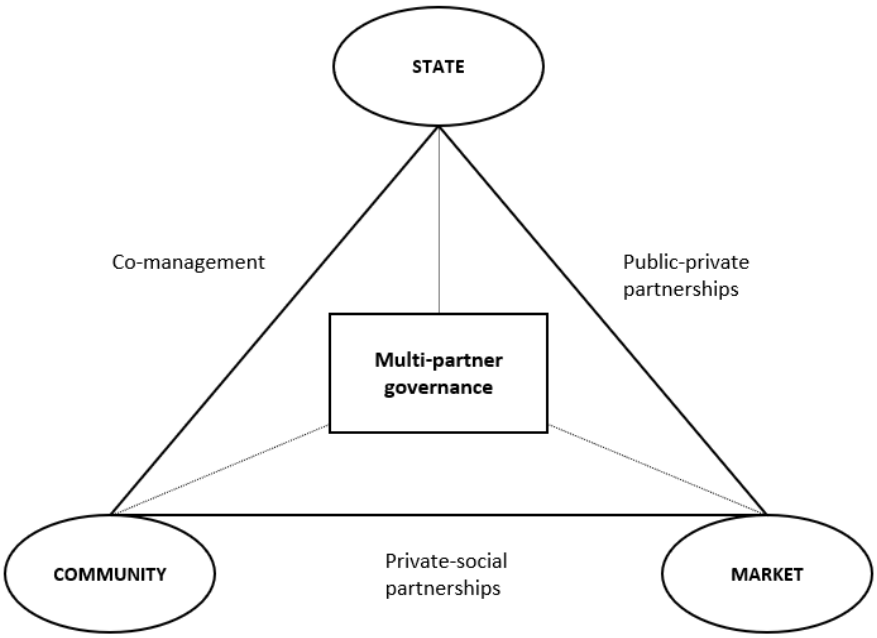

Figure 5: Hybrid Governance Structures (based on LEMOS and AGRAWAL (2009)).

In line with these terms, **collaborative governance** is defined by EMERSON et al. (2011, p.2) as “*the processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished*”. However, it is to mention that there is a lack of a definition which is commonly used in literature. ANSELL and GASH (2007) state that a wide-ranging use of the term ‘collaborative’ reflects the way it has emerged from many local experiments, often in reaction to previous governance failures. There is not ‘the one’ model of collaborative governance.

Concerning alternative arrangements for AEP, PRAGER (2015b, p.376) defines **agri-environmental collaboratives** as “*a form of place-based collaboration and collective action, based on partnership principles and voluntary participation. They (…) adopt their own constitution and have a mixed membership of farmers, conservationists, municipalities, rural residents, and other stakeholders. (…) These collaboratives exist in many countries under different names, but they have in common that they identify sustainable landscape management as their goal and carry out activities that support this goal*”. Furthermore, it is to clarify that collaborative AEP negotiate payments from beneficiaries

to providers of ES. However, unlike conventional AEP, it is a hybrid governance structure incorporating all three ideal types (Figure 6). Another link to the concept of **PES** can be drawn from the mediating character of cAEP. The variety of stakes providers and beneficiaries have, particularly require a facilitation of transactions by an **intermediary**. Typically, governmental actors provide funding while civil society actors support knowledge building. Also, one can regard the collaborative organisation itself as an intermediary (PRAGER 2015b, WESTERINK et al. 2017a). Other authors similarly refer to cAEP, emphasizing spatial coordination at **landscape scale** as well as capacities for conflict resolution and for motivating actors as their main advantages (FRANKS and EMERY 2013, MCKENZIE et al. 2013, GARCÍA-MARTÍN et al. 2016).

Figure 6: AEP and cAEP as Hybrid Governance Structures (based on MATZDORF et al. (2013)).

Concerning **initiation** of cAEP, PRAGER (2015b, p.376) states that "*they are typically initiated bottom up by local stakeholders, albeit in some cases there have been incentives for their establishment from regional government or research*". Moreover, there is a **distinction between collaboration and coordination** referring to different degrees of joint working (PRAGER 2015a). BOULTON et al. (2013) describe collaboration as cases when land managers meet, work together, and maintain a dialogue, whereas in a coordinated approach, land managers work towards the same objective but in isolation. This could occur when advisers help to identify neighbouring farmers and direct a joint application to ecological focus areas, but implementation is rather individual[5]. According to BOULTON et al. (2013), both coordination and collaboration can be bottom-up or top-

[5] This study will focus on the distinction according to different degrees of joint working. By contrast, BODIN (2017) distinguishes collaborations addressing coordination problems from those addressing cooperation problems. In the first situation, most actors agree on the objectives and need to coordinate actions, whereas in the second situation, actors have different opinions and interests, which require negotiation.

down evolved. PRAGER (2015a) placed initiatives reviewed by BOULTON et al. (2013) in a coordination-collaboration spectrum, accounting also for top-down or bottom-up initiation (Figure 7). Despite exceptions, there is a tendency that the combination top-down, coordinated approaches occurs with primarily public benefit, like with management of protected areas. The combination bottom-up, collaborative tends to evolve with increaseing private benefit, e.g. catchment management.

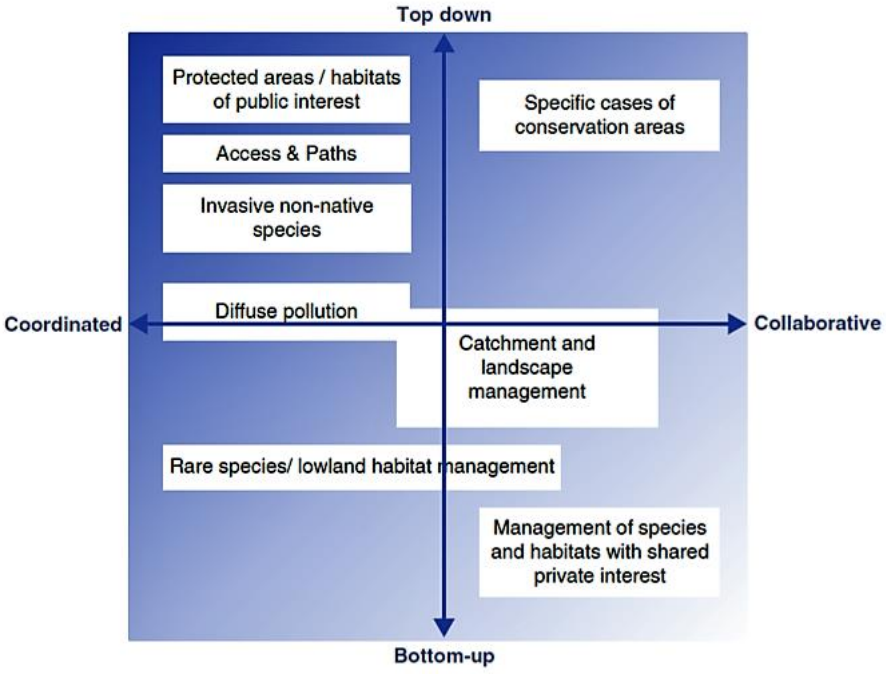

Figure 7: Collaborative Initiatives in the Coordination-collaboration Spectrum (adapted from PRAGER (2015a)).

PRAGER (2015a) suggests that combinations of collaborative and coordinative elements as well as bottom-up and top-down elements occur, **depending on the local context**. The more objectives are complex, contested and interlinked with developments in the wider landscape, like catchment management, collaborative approaches fit to the social-ecological context. They are suitable to mediate different interests, despite of requiring more effort (ibid.). Although definition and terminology in the context of collaborative governance and, specifically, cAEP, are rather ambiguous to date, common and frequent findings in literature provide a basis to refine key design characteristics **enhancing the fit of AEP**.

2.2 Analytical Framework

2.2.1 Developing and Testing of Hypotheses

The analytical approach to the research question on design characteristics of collaborative AEP builds upon the link between collaborative governance and PES theory. As a first step, **hypotheses on design characteristics** were compiled. MEYER et al. (2015) provide for assumptions on important design rules for the success of AEP and PES, which were used as a first orientation. The hypotheses were then derived by reflecting literature on cAEP, including case studies, which either directly or indirectly mention design characteristics (e.g. MILLS et al. 2011, PRAGER et al. 2012, WESTERINK et al. 2017b). In addition, design principles by Ostrom, for management of common pool resources, were considered (OSTROM 1990, OSTROM 2000). For the analytical approach at hand, the basic assumption is that cAEP **increase performance** of AEP **by improving institutional fit**. Accordingly, key design characteristics of cAEP that improve institutional fit were considered by comparing disadvantages of conventional AEP with advantages of cAEP. In a circular process of constant revision, the derivation of hypotheses finalized as provided in the table below. It should be acknowledged that design characteristics and drivers of emergence are interlinked, as well as the hypotheses themselves.

Table 1: Overview of Hypotheses on Design Characteristics (own elaboration).

RQ: Which design characteristics of cAEP improve institutional fit and thus increase effectiveness and efficiency?
H1: holistic local approach (several goals) better than single goals
H2: pressure to address a problem better than absence of pressure
H3: flexible approaches better than prescriptive ones
H4: participatory approach better than no participation
H5: cooperation in implementation and monitoring better than no cooperation
H6: broad involvement of professional advise/support better than single consultation
H7: Existing local network (incl. local key player) better than absence of network

The second step was the preparation of a **framework for testing the hypotheses**. SCHOMERS et al. (2015) provide an analytical framework for the performance of PES (cf. Appendix 1). According to this, effectiveness is influenced by participation levels and ecological accuracy that is mainly influenced by spatial targeting. Efficiency is influenced by public and private TCs. SCHOMERS et al. (2015) argue that PES implementing governance structures influence certain **determinants of effectiveness and efficiency**.

For this study, a shortened version of the framework was derived by focusing on those determinants assumed to be affected by cAEP (Figure 8). The selection was compiled by regarding the application of the framework on German Landcare Associations by SCHOMERS et al. (2015) and general literature on cAEP (PRAGER 2015a, WESTERINK et al. 2017b). By applying the shortened framework on own empirical case studies, it should be tested whether determinants are positively influenced by design characteristics hypothesized to improve the fit of cAEP. However, neither the determinants nor effectiveness and efficiency are independent from each other (SCHOMERS et al. 2015).

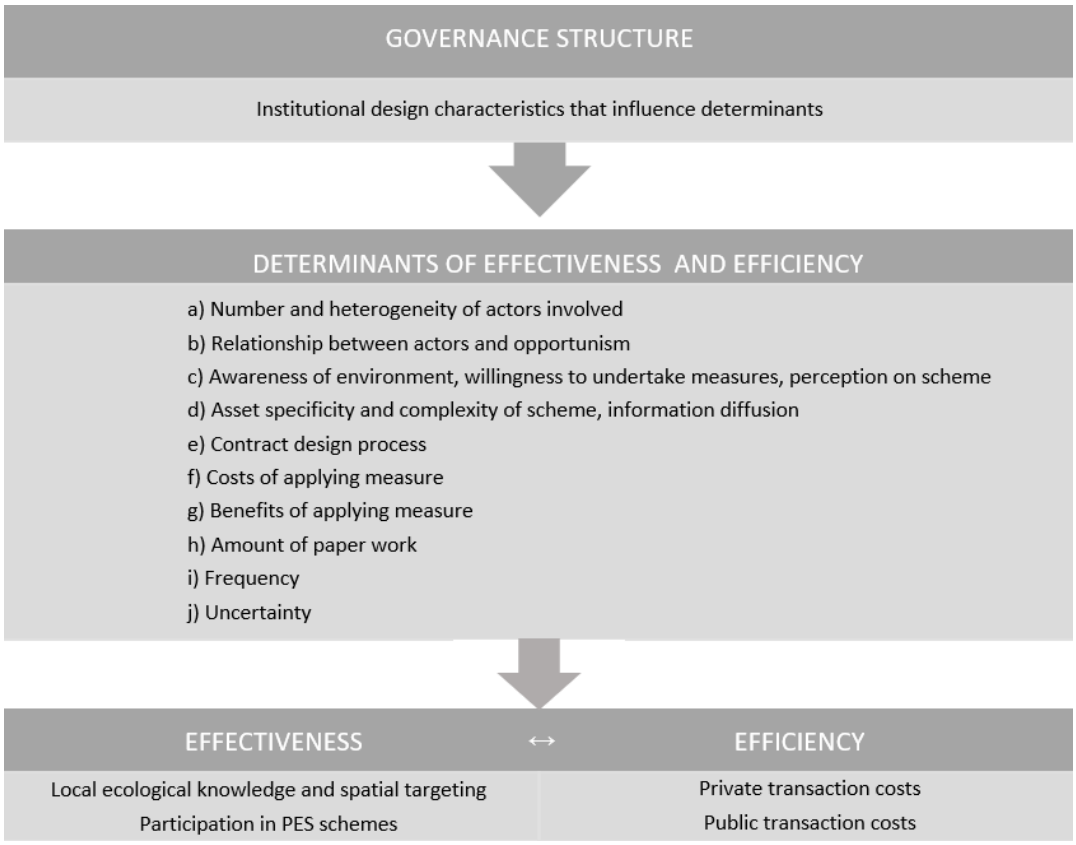

Figure 8: Framework for Testing the Hypotheses (based on SCHOMERS et al. (2015)).

In the following section, the derivation of each hypothesis on design characteristics improving institutional fit is explained. Possible influences of each design characteristic on determinants of effectiveness and efficiency are added to show the logic of the two steps described above. It is to point out that the presentation of hypotheses only considers **positive effects** on effectiveness and efficiency. The awareness that design characteristics may also negatively affect determinants of effectiveness and efficiency is important and is explicitly discussed in Chapter 5.

2.2.2 Presentation of Hypotheses

H1: holistic local approach (several ES) better than single goals

The first hypothesis was derived following the assumption in MEYER et al. (2015) on the importance of focusing on one environmental goal by addressing the respective ES. In conventional AEP, farmers often apply for single measures from the catalogue targeting single goals. This results in **neglecting interactions of ecosystems** and can be linked to a **functional misfit** (BODIN et al. 2016). Trade-offs between different ecological objectives can occur. While implementing one measure, effects on non-target species are often neglected (UTHES and MATZDORF 2013). The fact that farmers experience problems like unintended effects further supports their negative attitude and scepticism (PRAGER et al. 2012). Another problem occurs due to the mindset of **separating ecological and economic goals**, or, regulating and provisioning ES. On the one hand, they are often seen as contrary while ecological demand from society increases, which results in contesting behaviour of farmers (UTHES and MATZDORF 2013). On the other hand, there are farmers solely participating due to economic goals. As compensation payments are based on regional average opportunity costs, overcompensation occurs for farms that could easily implement measures at relatively low TCs (FALCONER 2000). Moreover, AEP are often seen as a secure source of income compared to volatile commodity prices and physical yield variations (UTHES and MATZDORF 2013). However, if farmers apply for AEP without being convinced, measures are likely implemented inaccurately.

By contrast, collaborative AEP are assumed to have a holistic approach targeting several ES that are related to the respective area. This results from the participation of all relevant stakeholders **including several (diverging) interests,** which are balanced in a process of negotiation (PRAGER 2015a). They rather have a **landscape approach**, considering the whole territory and combining different social-ecological objectives (PRAGER 2015b, GARCÍA-MARTÍN et al. 2016). Unintended ecological effects can thus be avoided in advance. The groups "*build bridges and deliver local and national policy objectives whilst simultaneously support their members' interest*" (FRANKS and MCGLOIN 2007, p.484). PRAGER (2015b) notes that economic interests are often served by the ability of groups to generate additional income, for example by establishing common marketing structures. Collaborative AEP deal with "*broader objectives such as improving the image of farming, providing recreational infrastructure or maintaining a network of landscape elements*" (PRAGER 2015a, p.62).

The holistic approach of cAEP is expected to improve *perception on the scheme* and *willingness to undertake measures* (cf. determinant c in Figure 8). These determinants related to motivation increase **effectiveness** through higher participation and accuracy (SCHOMERS et al. 2015, PRAGER 2015b). The harmonized objectives fit to the area in terms of implementation capacity (*costs* (f)) and ecological demand (*benefits* (g)) because both the demand (state or civil society) and supply side (farmers) participated in the decision process integrating local knowledge (PRAGER 2015a). This balancing decrease *uncertainty* (c) in terms of trade-offs and thus also contribute to **efficiency**.

H2: pressure to address a problem better than absence of pressure

MEYER et al. (2015) hypothesise the importance of application of measures to a certain area or habitat. However, conventional AEP are horizontal measures aiming to include many farmers and cover a wide area. A **lack of coordination** of types of measures and application locations which fit to the local ecological demand is another component of **spatial misfit** (PRAGER et al. 2012, LENIHAN and BRASIER 2009). Corresponding to the deadweight effect described, the logic of land enrolled in AEP does often not follow local ecological targets. UTHES and MATZDORF (2013) refer to participation of bigger farms having lower opportunity costs or farms already managing relative extensively. Moreover, farmers tend to enrol less productive areas into AEP and sometimes intensify management on the other areas (ibid.). The lack of spatial targeting has another dimension in that it questions the sense of AEP, which increases popular discontent.

Collaborative AEP, in turn, focus on a specific local ecological problem (LENIHAN and BRASIER 2009, TODERI et al. 2017). PRAGER (2015b) states that groups **tailor AEP to the regional context** which results from the motivation to address a specific problem or conflict. "*Collaboration is necessary where farmers need to negotiate potentially conflicting objectives and appropriate management, for example, common grazing, improving fresh water quality, and creating a habitat mosaic for rare species*" (PRAGER 2015a, p.62). The existence of a conflict is thus a **consequential incentive for actors to engage** in collaboration (EMERSON et al. 2011). By contrast, conventional AEP fail to balance limited local benefits from ES and high public costs. This is in line with Ostrom, emphasizing that common pool resources are often successfully managed by local collective action overcoming self-interested behaviour in view of conflicts and resource exhaustion. The second design principle of OSTROM (1990) for management of common pool resources opts for congruence between appropriation and provision rules and local

conditions. Taking account for spatial and temporal heterogeneity of these resources is best performed at local scale under the condition of congruence between appropriation and provision rules resulting in a balance between costs and benefits of collective action (OSTROM 1990, COX et al. 2010). Hence, in view of a local ecological problem cAEP bear the potential to achieve a balance, which fosters the actors' engagement.

The pressure to address a problem, similar to H1, is suspected to improve **effectiveness** through motivation related determinants like *perception on the scheme* and *willingness* (c) to participate since local stakeholders see reasonability and benefits of applying measures. Moreover, it increases the *number* (a) of participants by addressing people's responsibility to contribute to a solution. A feeling of common responsibility for the area may also influence the *relationship between actors* and reduce *opportunistic* (b) behaviour (SCHOMERS et al. 2015). Finally, problem solution by compiling local knowledge can lead to reduced TCs and contribute to **efficiency** (ibid.).

H3: flexible approaches better than prescriptive ones

The third hypothesis covers two aspects mentioned by MEYER et al. (2015). First, the relevance of technical, temporal and area-wise application flexibility is highlighted, and second, flexibility in contract length. In conventional AEP, prescribed measures are sometimes inappropriate for the local context (**spatial misfit**). For example, there were cases of grassland extensification with delayed cutting that caused a decrease of soil invertebrates, so birds preferred conventional fields as forage areas (KLEIJN et al. 2001). These unintended effects were already described, but it is important to stress that the **lack of flexibility prevents from local adaptation to problems**, in spatial or temporal application or the operation itself (UTHES and MATZDORF 2013). Moreover, motivation to participate in AEP is lowered by strict management prescriptions disregarding farmers knowledge and innovative capacity (HODGE 2001). "*Expert knowledge can readily bypass local expertise*" (PRAGER et al. 2012, p.245). The lack of flexibility is not only related to the application of measures but also to contract length. Conventional AEP have relatively **short contract periods** compared to time periods needed to achieve a sustainable ecological effect (UTHES and MATZDORF 2013). This corresponds to what CUMMING et al. (2006) describe as a **temporal misfit**. There is no incentive for continuity in measures which are ecologically desirable. Instead, fall-backs can occur after payments are received (HODGE 2001).

Collaborative AEP improve spatial and temporal fit by leaving application flexibility to the farmers, making use of their knowledge of the local context (WESTERINK et al. 2017b). Flexible approaches allow for **spontaneous adaptation** of measures in case of urgent need (PRAGER 2015a). An increase in acceptance and **motivation** is another positive effect (PRAGER 2015b, MCKENZIE et al. 2013). Moreover, temporal fit is improved since cAEP strive to increase contract length to take advantage of learning effects, leading to a constant improvement of the programme, and trust[6] building (GARCÍA-MARTÍN et al. 2016, BOULTON et al. 2013). As cAEP often use mixed funding, the basis for **continuity** of the initiative and its aims is more secure (PRAGER 2015a).

A flexible approach in application of measures is assumed to increase **effectiveness** and **efficiency** through influencing motivation (c) of farmers. Most importantly, flexibility reduces farmers' *costs* (f) because they can implement measures based on their local knowledge and adapted to their farming systems (SCHOMERS et al. 2015). Regarding contract length, it is assumed that benefits arise from *frequency* (i) of transactions as well as from reduced *uncertainty* (j) concerning the behaviour of actors (ibid.).

H4: participatory approach better than no participation

The next hypothesis is oriented at MEYER et al. (2015) assuming the importance of mutual design. The design of conventional AEP is the responsibility of EU agricultural administration involving nature protection administration in commenting as well as other relevant administration at different levels (UTHES and MATZDORF 2013). However, there is a **lack of participation of local stakeholders** which represent the relevant scale for many ecological processes. According to CASH et al. (2006), a **misfit** also results from a lack of interplay between social organizations. Diverging local administrative and ecosystem boundaries further complicate the local interplay needed (PRAGER et al. 2012). This leads to deficient alignment of management prescriptions and opposing attitude of farmers, who feel patronized (UTHES and MATZDORF 2013). Further criticism on conventional AEP concerns the high **bureaucratic** level, resulting from a hierarchical structure, and slow processes of scheme adaptations that are not in line with problems occurring in

[6] This concept is not examined in detail for this study. Some authors focus on intermediaries in cAEP and the linked concepts of trust, social capital, bonding and bridging organizations (PRAGER (2015b), WESTERINK et al. (2017a), SCHOMERS et al. (2015)).

ecosystems (**temporal misfit**). Reasons are that public authorities tend to include own objectives of budget maximization or avoiding additional workloads (ibid).

Collaborative AEP improve spatial and temporal fit by **actively involving farmers and other local stakeholders** in the design process. Priorities and demand for ES differ between regions, social groups, and over time. "*For this reason, it may be necessary to extend the focus beyond land managers to rural communities*" (PRAGER et al. 2012, p.245). Hence, the design is better adapted to local conditions and implementation is improved because farmers feel ownership for the programme (TODERI et al. 2017, PRAGER et al. 2012). This is in line with Ostrom's third design principle suggesting that most individuals affected by the operational rules can participate in modifying them (OSTROM 1990). COX et al. (2010) explain that local stakeholders have best access to information about their situation resulting in a comparative advantage in designing effective rules for that location. Moreover, cAEP tend to be flexible in adaptation of rules and strive to **reduce bureaucracy** (PRAGER 2015b, WESTERINK et al. 2017b).

Collaboration in the design process is supposed to result in a higher *number and heterogeneity of actors* (a) involved which has a significant influence on the effort required in terms of legitimacy and acceptance. By involving nature experts and farmers, *benefits* (g) and *costs* (f) need to be balanced which improves **effectiveness** and **efficiency** (PRAGER 2015a). For example, a reduction in *amount of paperwork* (h) is likely to be considered. The *relationship between actors* (b) can improve by communication, conflict resolution, and learning during negotiations, which increase *information diffusion* (d), *awareness of environment* and *willingness to undertake measures* (c) (SCHOMERS et al. 2015).

H5: cooperation in implementation and monitoring better than no cooperation

MEYER et al. (2015) suggest implementation support of nature protection agencies, in addition to collaboration on design. Conventional AEP target the single farm level leading to individual, disconnected actions instead of encouraging coordination at landscape level (PRAGER et al. 2012, KLEIJN et al. 2011). A **lack of coordination** of measures for ecological networks to improve biodiversity conditions are particularly problematic in intensively farmed regions (UTHES and MATZDORF 2013). This **spatial misfit** between the scale of management and the scale of ecological processes results in a lack of demonstrable benefits. In combination with the prescribing character of measures and

monitoring by public authorities, there is an inability of conventional AEP to rise ecological awareness of farmers (EMERY and FRANKS 2012).

In collaborative AEP, actors coordinate measures at landscape level maintaining **ecological networks** (PRAGER 2015a, FRANKS 2011). The groups facilitate both co-operation among farmers and between farmers and actors of nature protection. Shared responsibility for environmental improvements fosters **sharing** of machinery and tools, or undertaking tasks of others, and mutual **learning**. This can further improve **trust** and respect among actors and cooperation increasingly builds on reciprocity (PRAGER 2015a, WESTERINK et al. 2017b, FRANKS 2011). Moreover, cooperation on monitoring is seen as beneficial to rise environmental awareness because participants **directly observe results** of implemented measures, which spurs motivation (EMERY and FRANKS 2012, BOULTON et al. 2013). Likewise, Ostrom's design principle on effective monitoring by monitors who are part of or accountable to the appropriators suggests that monitoring is often a byproduct of collective action detecting non-compliance at relatively low costs (OSTROM 1990, COX et al. 2010, MILLS et al. 2011).

Cooperation in implementation and monitoring could bear the advantage of shared *costs* (f) among farmers concerning implementation costs, but also of saved costs resulting from better *information diffusion* (d), e.g. if farmers share knowledge and experience with certain measures (SCHOMERS et al. 2015). Regarding also **efficiency**, public costs could be lowered because TCs of controlling opportunism are partly shifted to the group, especially if they carry out ex-ante monitoring (ibid.). Within the group, where actors know each other, *opportunistic behaviour* (b) is easily controlled. This contributes to an increase in accuracy of applying measures and thus **effectiveness**. A reduction of *un-certainty* (j) is further achieved through mutual trust. Over time, collaboration tend to improve the *relationship between actors* (b) by creating trust, especially between farmers and nature conservationists (WESTERINK et al. 2017b).

H6 broad involvement of professional advice/support better than single consultation

This hypothesis orientates at MEYER et al. (2015) stating that advice services are relevant to success. A lack of training and education has been identified as participation limiting factors in conventional AEP (UTHES and MATZDORF 2013). Even though access to advice is available, a **functional misfit** often occurs because advice targets **individual farmers** at **selective occasions**. Learning effects and a rise of environmental awareness are

therefore limited. According to UTHES and MATZDORF (2013), farmers often **contest advice** if they feel that prescriptions are inappropriate and tend to carry out measures inaccurately if they are not convinced of their effectiveness.

Collaborative AEP involve actors for advice services and training to ensure a **common knowledge basis** by organising educational events with the group. Thereby, knowledge transfer from professional advisers to farmers as well as knowledge transfer among farmers is important. It contributes to **environmental awareness**, sense-making and even to changing mindsets (PRAGER 2015b). External advisors are often well known to group members and support the group with administrative and mediation tasks (MILLS et al. 2011, PRAGER and VANCLAY 2010). A **long-term support creates trust** between advisor and farmers as well as other actors, which improves implementation of imparted contents (OECD 2013). Another beneficial aspect of broad involvement of advice is reducing risk for farmers concerning own mistakes in implementation of measures but also mistakes of others that regress to the groups achievements (FRANKS and MCGLOIN 2007).

A broad involvement of professional advice or support is expected to have an important influence on *information diffusion* (d) and thus improves **effectiveness** and **efficiency** of applying measures. Efficiency of advisory services themselves are enhanced due to group meetings instead of individual consultations (MILLS et al. 2011). Furthermore, the *amount of paperwork* (h) can be reduced by constant external support decreasing private but also public TCs if forms are filled in correctly (SCHOMERS et al. 2015). The organisational support of a 'neutral' party involved in conflict resolution has a positive impact on the *contract design process* (e). Finally, technical advice and operational support reduces *uncertainty* (j), both in terms of what to do and the contribution of others (ibid.).

H7: Existing local network (incl. local key player) better than absence of network

The aspect of the last hypothesis is not mentioned in MEYER et al. 2015 but is particularly important for collaborative approaches. Conventional AEP target individual farmers and thus lack a social incentive to participation, compliance and coordination to extenuate the **institutional misfit**. By contrast, cAEP operate at a larger scale often involving an existing social network based on regional identity and sense of place (PRAGER 2015a). There may already be a **basis of communication and trust** among farmers, or between farmers and civil or even public actors, which results in increased willingness to collective action (MILLS et al. 2011, OECD 2013). Existing structures may be **experienced in**

resolving conflicts. In later publications, Ostrom examined attributes of resource appropriators conducive to form self-governance associations. The importance of prior organisational experience and local leadership through participation of actors in other local associations or through neighbouring groups is highlighted in OSTROM (2000). Group and group member characteristics can function as drivers. Particularly, **key individuals** with the skills and determination to **move the group** forward can play an important role (MILLS et al. 2011, FRANKS 2011). Several authors suggest that governments should support existing networks, because it is less costly and time-consuming than initiating a group without existing personal connections (PRAGER 2015a; 2015b, BOULTON et al. 2013, MILLS et al. 2011).

In building upon an existing network, the *relationship between actors* (b) is presumed to be on a good basis for the *contract design process* (e) as well as for joint implementation and monitoring. *Uncertainty* (j) regarding the behaviour of others may be reduced which further contributes to **efficiency** in cooperation (SCHOMERS et al. 2015). Another advantage is that existing networks provide social incentives to participate that are related to regional identity, neighbourhood, and reputation. This increases *willingness* (c) to participate, so the *number of actors* (a) is sufficient to achieve ecological **effectiveness** (ibid.).

3 Methodology

3.1 Data Collection

The two-tiered approach for this study, described along with its aims in Chapter 1, encompassed a mixture of methods. A combination of literature review, qualitative interviews and field visits for the empirical case studies, and an expert interview at the end balanced detailed but contextualized insights with more generalizable findings.

In the previous **literature review** using Google scholar, different examples from Europe were searched for from which **eight case studies** were selected to be compared in a general **overview** that aims to point out general interrelations and represent the diversity of governance arrangements that can be related to collaborative approaches. Due to the absence of a common definition, a variety of search terms included 'collaborative governance', 'collective management', 'interactive governance', or 'multi-stakeholder approach'. Often, following up on the literature cited in cases discovered proved to be more successful than using search terms. The selection of case studies was theoretical instead of random due to criteria referring to;

- involvement of stakeholders from all spheres of society,
- a landscape approach and spatial coordination,
- co-financing from EU,
- success and sustainability of the agri-environmental initiative.

Nevertheless, it reflected existing literature (including scientific and grey literature) in a way that most examples were from Western and Northern Europe and represented cases from sparsely inhabited regions with cattle farmers involved.

For the **deeper analysis of design characteristics**, **four case studies** from Belgium (Flanders) and the Netherlands were selected;

(1) the project 'Levendige Boerensloot' in the West of Utrecht (LBs), NL,
(2) the Gouwe Wiericke Programme (GWP), NL,
(3) the Triple C-project in Essen (TrC), BE,
(4) the polders of Kruibeke-Bazel-Rupelmonde (KBR), BE.

These case studies were selected because they are in more intensively farmed landscapes with higher population density and thus a higher conflict potential. This selection criterion was added to the ones described above[7]. Another additional criterion was that both cases

[7] This study neglects German Landcare Associations due to the aim to review initiatives from abroad. These initiatives are described by PRAGER and VANCLAY (2010), in comparison to Australian Landcare groups.

represent projects currently running and co-funded by the EU. These were also regarded important to gain insights about the potential of collaborative approaches for future CAP policies. All four case studies were not directly found in literature but resulted from contacting researchers who published on collaborative AEP in those regions and provided for contacts in public and private organisations. Finding interview partners and selecting case studies were interlocked processes.

The interviews were prepared and conducted as **in-depth interviews**, which are rather unstructured but a good form to explore individual perspectives on processes, outcomes and challenges of the cAEP the respective interviewee was involved in. Regarding the analysis of a multi-stakeholder governance approach, it was particularly important to include the different perspectives of public and private stakeholders. Accordingly, the following interviews were conducted in October and November 2017:

Table 2: Overview of Interviews Conducted (own elaboration).

Interview	Interviewee	Case study
BE01	expert on farmer groups from ABC Eco²	KBR, TrC
BE02	farmer and project coordinator from ABC Eco²	TrC
BE03	regional coordinator for East-Flanders from ABC Eco²	KBR
BE04	farmer and regional coordinator from ABC Eco²	KBR
NL01	project coordinator from water board HDSR	LBs
NL02	Province of Utrecht	LBs, GWP
NL03	farmer and board member of farmer group	LBs
NL04	project coordinator from water board HDSR	GWP
NL05	Province of Zuid-Holland	GWP

All interviews were conducted face-to-face and took place within arranged appointments. The interviewees knew about the content of the interview and were able to prepare themselves. The advantage of in-depth interviews is the atmosphere of a conversation. The interviewee may feel more comfortable when the interviewer manages to create a climate of empathy and communicates interest and attention (LEGARD et al. 2003). This is the basis for detailed responses about reasons, feelings, beliefs and opinions, and it allows for unintended topics to appear (ibid.).

Nevertheless, an **interview guideline** for all interviews was developed to ensure that all aspects are covered[8]. The guideline contained 14 questions and followed the logic of asking about design characteristics hypothesized and their impacts. It included also an open-ended question about challenges, which was always posed towards the end of the interview. All other questions were posed during different stages of the interviews or used as a check-list if the interviewee already covered subjects. The adaptability of the interviewer was important by spontaneously interposing appropriate questions and dropping questions if during the conversation their insignificance occurred (LEGARD et al. 2003). It was also due to the nature of interviews that their length ranged from 45 to 90 minutes. Another reason is that some interviews required a translation between English and Dutch, but most were conducted in English. Also, some interviewees invited a college to join the conversation. All interviews were **recorded and transcribed** to enable an analysis of the content, except from BE02. Due to technical reasons, the interviewer simply took notes during this interview.

Finally, one additional **expert interview** (EI) was conducted to gain further information from an **outside perspective**. This interview took place during a symposium in March 2018 which the interviewee attended as a researcher in the field of, among other, agri-environmental policy. Questions regarding the data collected and general challenges of cAEP were derived beforehand with the expectation to get assistance with interpretation of the data. Information obtained from the expert interview, as well as recommended literature, were added to the discussion of this study.

3.2 Data Analysis

First, and most important, there were restrictions in comparability of both the case studies from literature and the empirical cases. A critical awareness of this while analysing the data collected was essential. The selected **case studies from literature** were compared in their temporal and spatial context and ES targeted and were classified according to terminology and concepts presented in theory. Thereby, differences between cases became clear and showed the problem of comparability. In addition, all cases were from different countries and had different legal conditions despite of a common EU-legislation. Nevertheless, interdependencies also mentioned in literature occurred, next to proving the diversity of cAEP. The empirical case studies were added to this overview which helped

[8] The interview guideline can be viewed in Appendix 2.

to undermine interdependencies while embedding them into the context of literature findings.

The **empirical case studies** were then analysed in detail by relating the hypotheses on design characteristics to each case and examining in how far each governance structure impacts determinants of effectiveness and efficiency based on SCHOMERS et al. (2015). A table used for this step of analysis is in Appendix 4. All in all, Figure 9 illustrates the analytical steps of testing hypotheses, which were derived beforehand. However, comparability of the case studies was again restricted. On the one hand, generalizability of findings was improved by applying a multiple case design. On the other hand, the four case studies again represented different legal contexts since collaboration on agri-environmental measures is mandatory in the Netherlands. Moreover, one case study from each country was embedded in the context of a Special Area of Conservation under the Natura 2000 network, which was assumed to further increase conflict potential.

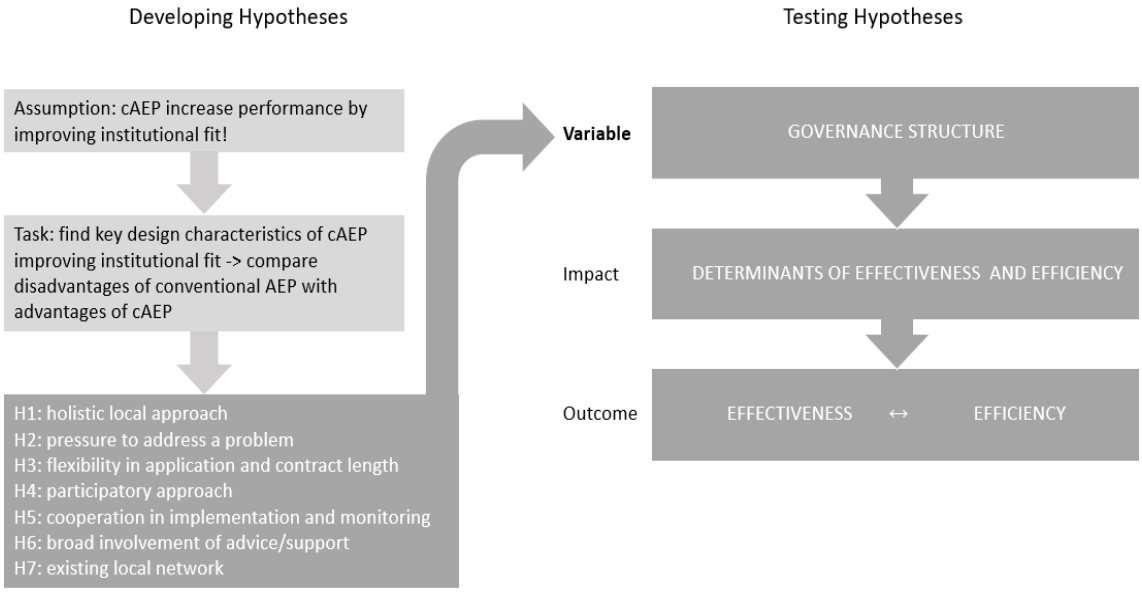

Figure 9: Illustration of Analytical Steps (own elaboration).

Another issue required critical awareness, was **verifiability of hypotheses**. Following **critical rationalism theory** going back to Karl Popper, humans are restricted to a subjective perception of the world and can thus not claim their experiences and opinions to correspond with actual reality. In "*The Logic of Scientific Discovery*", Popper criticises the doctrine of empirical verifiability of theories. Inference to theories from singular

statements which are ‘verified by experience’ is logically inadmissible because universal statements “*are never derivable from singular statements but can be contradicted by singular statements*” (POPPER 1959, p.19). Such a contradiction is seen as a progress in revision of theories. POPPER (1959, p.18) therefore suggests that “*not the verifiability but the falsifiability of a system is to be taken as a criterion of demarcation*”. In line with these considerations, a logical analysis of hypotheses derived in this study was as follows: a hypothesis was ‘not rejected’, respectively ‘accepted’, instead of ‘confirmed’ if the case study showed that determinants were positively affected.

4 Results

4.1 Case Study Overview

4.1.1 Introduction to Case Studies

The overview of case studies found begins with a brief description of all cases followed by a classification according to the theory presented beforehand. This includes four examples from Belgium and the Netherlands which were used for the in-depth analysis (indicated with *). In contrast to the others, these four cases were chosen later within the research process and are mainly based on empirical data that will be presented in Chapter 4.2. Nevertheless, the in-depth case studies are included here in order to be classified in accordance with cases from literature and complete the spectrum of arrangements found under the term of collaborative AEP[9].

Balmacara Estate - Scotland

Crofting is a traditional farming method including extensive cropping on poor arable land and keeping cattle on common grazing land. It shapes the landscape and contributes to cultural identity and attraction of tourists. In Balmacara Estate, an area owned by the National Trust, farmers and three townships worked together with the Trust to maintain decreasing crofting activities. A lacking fit of AEP with this farming system was one major complaint. Consequently, the Traditional Croft Management Scheme was introduced in 2006 in order to target this small-scale farming and numbers of participating crofters increased (BOULTON et al. 2013, NATIONAL TRUST FOR SCOTLAND 2012).

Söne Mad - Sweden

The Söne wetland was historically used as common grazing land before the Swedish Air Force operated on the area. When they left, the land was overgrown and covered with bushes which inhabitants considered as unpleasant. Moreover, people complained about a foul smell that appeared due to biophysical changes of the wetland area. In 1995, the Söne Mad grazing association was established to reactivate common grazing and to restore the open landscape of a semi-natural grassland rich in biodiversity. Landowners lease their land to the association while farmers are responsible for common fencing and keeping grazing pressure constant. The association shares agri-environmental subsidies received for landscape management, but the payments do not specifically target collective action (OECD 2013, WÄSTFELT et al. 2012).

[9] A separate listing of literature for the cases found is provided in Appendix 3.

Pontbren Catchment – Wales

The farmer initiative aimed at more sustainable farming recognizing an insecurity of high input costs with ongoing intensification and an uncertain future for farm subsidies. High stock numbers degraded hedges and woodlands on their farms, which beside shelter for livestock also provide control of flooding. Consequently, they increased hedges and other landscape elements and even experimented with reductions in livestock numbers and developed strategies for product marketing. They became a co-operative in 2003 and thus were able to handle group finances. By operating as a group, they could access alternative sources since the AEP was regarded as inflexible. The group became interesting for research projects, which secured additional funding sources and opened flexibility for new environmental effort, e.g. building ponds (WYNNE-JONES 2017, MILLS et al. 2011).

Bauges Massif, Northern Alps – France

The mountainous area faced a growing conflict after becoming a Parc Naturel Régional (PNR) in 1995. Farmers under economic pressure saw opportunities in selling products under the new label but a growing commitment to Natura 2000 inconvenienced many of them. Therefore, the PNR officers developed the project "Flowering meadows" together with the national agricultural research institute which was tested in a competition for the best agri-ecological balance of species-rich grassland meadows in 2007. The resulting project is based on a payment that depend on the output using a list of indicator plant species, which was developed with the farmers. The list includes valuable species from an ecological point of view as well as one valuable fodder plant. Other regions in France followed the example of this area (SAINTE MARIE 2013).

Burren, County Clare – Ireland

The Burren LIFE project[10] was introduced in 2005 to limit nitrate pollution of water and maintain the landscape by supporting traditional extensive livestock grazing practices which were decreasing due to economic pressure and a lacking fit of AEP on local conditions. The project aimed at developing individual whole-farm management plans using modern technology combined with traditional management systems. Local governmental departments and agencies, farmers and conservationists collaborated on these plans. Experiences from this lead to the Burren Programme started in 2010 which provides also payments on the output and succeeded to increase enrolment of farmers (BURREN LIFE PROGRAMME 2016, LENIHAN and BRASIER 2009).

[10] LIFE is an EU-funded programme for environment and climate action.

Aso Valley, Marche Region – Italy

The regional authority for AEP introduced agri-environmental agreements at the landscape scale (AEAs) in the period of 2007-2013. The aim was to coordinate one commonly agreed measure from four local environmental priorities above the farm level. In the Aso valley, the AEA on water was chosen to reduce high input of pesticides in the dominant fruit-growing region. Parts of the area were included in a Nitrate-Vulnerable Zone. The motivation of farmers to apply for an AEA was triggered by a local advisor who they trusted. Measures were discussed in participatory meetings and an agreement was achieved on a new technique on mating disruption of pests. Regional officers negotiated with the EU to enlarge the eligible area to make the application beyond the Nitrate-Vulnerable Zone as requested from local stakeholders. The project continues during the period of 2014-2020 (TODERI et al. 2017).

Dommel Valley, Limburg – Belgium

The Dommel Valley Watering is a local organisation for water management in the province of Limburg. In 2006, a project started to convince farmers to mount inter-connected buffer strips alongside brooks running through their land. In addition to reduced run-off, the application of fertilisers and pesticides was reduced. Combined with a strategy of adapted mowing both water quality and biodiversity could be improved. This was possible, because the water organisation is respected by farmers due to its high farmers' membership. Moreover, there were concerns among farmers regarding expropriation to meet nature protection targets. For the management of buffer strips the Flemish Land Agency provided subsidies through the national AEP. In 2008, the project received co-financing by becoming part of an EU-Interreg[11] project and involved an increasing number of farmers until 2012. Some of them are now organised in a group for continued work on water conservation (WESTERINK et al. 2017b, KROM 2017, OECD 2013).

Northern Frisian Woodlands Association – Netherlands

The farmer initiative aiming at autonomy in conservation activities was an important pilot project for the new Dutch AEP and is still a pilot project for the EU. In 1992, farmers in the area founded two environmental cooperatives including objectives like maintenance of landscape and reduction of nitrogen emissions in an action plan. The planning involved citizens, the province and a farmer organization who all contributed to knowledge gathering and administrative support. In 1995, they received the official status of a

[11] Interreg is an EU funding initiative for cross-border cooperation targeting sustainability.

governance experiment. In 2001, four cooperatives joined the establishment of the Northern Frisian Woodlands association and a central office staffed by three employees supported the association in coordination and application activities. An inspection committee was established to monitor whether farmers commit to the agreements. Moreover, new projects for the reuse of timber, a niche milk product and a region-branding focusing on tourism evolved (TERMEER et al. 2013).

Levendige Boerensloot, Utrecht – Netherlands (LBs)*

In the west of Utrecht, an agri-environmental farmer group collaborate with the water board and the province on water conservation measures. The group already existed before the new Dutch AEP and used to work on meadow bird protection. In 2008, a pilot group on Green-Blue Services worked on ditch maintenance, water storage and the installation of little woods and a walking path through their lands. In 2014, they started cooperating with the water board on ecological ditch maintenance, networks of buffer strips and joint monitoring of biodiversity and water quality. From 2016, the province included water management in their framework plan for the AEP. Due to this additional funding, the number of participating farmers could be increased (NL01, NL02, NL03).

Essen-Kalmthout, Antwerp – Belgium (TrC)*

The EU-Interreg project Triple-C runs from 2016-2020 and aims to increase water storage in certain catchment areas including knowledge of the agricultural community. Farmers in the north of Flanders are vulnerable to extreme weather and therefore a farmer group in Essen-Kalmthout was formed to work on spatially coordinated water management. Through the project acquired by the Flemish umbrella organisation for agri-environmental farmer groups they receive subsidies to build small dams in the ditches alongside their fields. Next to water level regulation the farmers collect data which is gathered by the province of Antwerp to improve erosion and flooding models (BE02).

Gouwe Wiericke Programme – Netherlands (GWP)*

The area of Gouwe Wiericke is characterized by pastures intersected by a network of ditches. Since the national nature network plans to build a corridor of wetlands through the area a strong resistance is formed. After 20 years, the conflict led to the installation of a local stakeholder platform responsible for planning and implementation. In 2016, local agricultural and nature related parties, municipalities and water boards signed a contract to reach the goals of the nature network. They jointly develop multi-objective plans for the region and provide a set of incentives for farmers in the core zone to the

ecological corridor. The local agri-environmental farmer groups participate in this contract and direct measures on the entire planning. Nevertheless, negotiations are still going on and the corridor is not implemented yet (WESTERINK et al. 2017a, NL04, NL05).

Polders of Kruibeke-Bazel-Rupelmonde – Belgium (KBR)*

The Polders of Kruibeke are located in an area for controlled flooding, which is also a nature reserve to protect meadow birds. Agreements with farmers having been ex-propriated were reached after years of conflict. The farmers are organised in a group since 2009, which helped to have a voice in meetings of the stakeholder platform setting up the agreement. Now, they still use the meadow area and help to maintain it. In addition, they have contracts for mowing the dykes. The group regularly meets to coordinate activities and engages in other collaborative projects of landscape management in the region. They are supported by an organisation working on the establishment of agri-environmental groups in Flanders (VIKOLAINEN et al. 2013, BE03, BE04).

4.1.2 Classification of Case Studies

Spatial and temporal context

The case studies introduced above can be divided into two groups. First, there is a group from more remote areas with relatively **low population density** (less than 30 inhabitants per km²). The landscapes are partly shaped by agriculture. There are similarities between the Irish, Scottish, Swedish and Welsh examples considering rough climate conditions, open landscapes and barely arable land where the main farm activity is livestock keeping. Despite of its slightly higher population density, one case study from France is added to this group since it is in a remote mountainous area with dairy farmers. Second, there is a group of cases from Belgium, the Netherlands and one from Italy located in areas with a **higher population density** (more than 100 inhabitants per km²). Rural areas are to a large extent shaped by agriculture. However, different interests on land bear a higher conflict potential, because compared to areas from the first group land is scarce. The case studies from the Netherlands and Belgium are similar in climatic conditions and the farm activity of livestock keeping and a few crops, whereas the Italian case study refers to fruit production in a Mediterranean climate.

In terms of **scope**, there is a wide range in size of areas operated within as well as numbers of farmers participating. Most of the cases from the first group involve a smaller number of farmers (up to 25), whereas most cases from the second group are marked by a higher number of farmers. Regarding temporal aspects, two initiatives were founded earlier in the 1990ies. Other cases emerged between 2001 and 2007. The four empirical examples emerged even later although farmer groups in the Dutch cases already existed before becoming embedded in collaborative structures. Once established, most case studies are permanent and not limited to the duration of a project but their goals, actors involved, or funding sources **changed over time** (e.g. Pontbren). Although the analysis of initiatives is restricted to a static approach here, the author acknowledges their dynamic character.

ES targeted and additional goals

The goals are connected to the spatial and temporal context. In most cases, **several interlinked ES** were targeted depending on the local ecological demand, e.g. landscape elements and biodiversity or water quality and biodiversity. The longer initiatives existed, the more goals and tasks evolved over time. This holds for environmental goals in the focus as well as for **additional socioeconomic goals**. For example, in Balmacara, the traditional farming system was maintained, which is important for identity and attraction of tourists. In the Swedish case, some farmers turned to organic farms exporting spelt. Similarly, in the Italian example, farmers were able to build up a production chain. The Flemish case in Essen targets water storage and additionally provides data for land-use models. In some initiatives from intensively farmed regions improving the public image of farmers and their relationship to nature-related stakeholders was targeted (e.g. Dommel valley). Additional goals often contribute to **sustainability** of the initiative or serve as a driver from the beginning on. For example, in the oldest case in Frisia, developing marketing opportunities and regional reputation enabled the farmers to expand in ES targeted and vice versa.

Governance approach

The governance arrangement depends to a certain extent on the spatial and temporal dimension and goals. When comparing underlying governance structures of the case studies it is reasonable to consider the examples from remote regions separately from the examples in regions where pressure on land is higher. Accordingly, Table 3 shows highlighted factors influencing or resulting from participating actors and their way of interaction for the case studies in more remote areas.

Table 3: Factors Characterising Case Studies in More Remote Areas (own elaboration).

Cases / Parameters	Balmacara (SCT)	Söne Mad (SWE)	Pontbren (WLS)	Bauges (FR)	Burren (IRL)
Ownership of land	National Trust Scotland	non-farmers	farmers	farmers	farmers
Initiation	bottom-up	bottom-up	bottom-up	top-down	top-down
ES targeted	landscape, biodiversity	landscape, biodiversity	landscape, flood control	biodiversity, landscape	biodiversity, water quality
Source of funding	private	public (AEP)	mix of public and private	public (AEP)	public (AEP among other)
Contracting	farmer-NTS	farmer-group	farmer-group	farmer-agricultural ministry	farmer-project leader
Implementation and monitoring	joint	joint	joint	individual	individual
Type of approach	collaborative	collaborative	collaborative	coordinated	coordinated

The cases can be further classified by linking spatial context to the type of approach and its initiation according to the **coordination-collaboration spectrum** provided in PRAGER (2015a) (cf. 2.1.5). First, there are three small-scale examples from Scotland, Sweden and Wales. They can be characterised by the goal to manage **habitats with shared private interest** among a small group of farmers. These are bottom-up initiatives and have a collaborative approach where they negotiate on contracts and jointly work on implementation and monitoring tasks. Another similarity is that these cases emerged partly due to a lacking fit of conventional AEP to their farming systems. Second, the examples from France and Ireland can be characterised by the goal to manage **habitats of public interest**, top-down emergence and a coordinated approach. Despite of a joint negotiation of the programme, implementation is done by individual farmers under individual contracts. In both examples a return to traditional extensive farming practices occurred.

Regarding the case studies from areas with higher pressure on agricultural land Table 4 shows highlighted aspects influencing or resulting from participating actors and their way of interaction. Also, these cases can be further classified following the example in PRAGER (2015a). There is a large group of examples operating with **catchment and landscape management** which have both top-down and bottom-up as well as coordinated and collaborative elements. For example, activities started independently, but the initiative was supported by an intermediary (e.g. TrC). Hence, they are at the centre

of the spectrum, which is shown in Figure 10 below. The Italian case can also be matched to 'management of diffuse pollution' and has a rather coordinated approach with individual contracting and implementation, which also applies to the cases of Dommel and TrC. By contrast, the cases of Frisia and LBs emerged from a tradition of bottom-up farmer groups and are rather collaborative with elements of joint monitoring. The remaining cases of GWP and KBR form a separate group of **specific cases of conservation areas**. Despite of bottom-up farmer groups operating in these collaborative networks, the network itself is top-down initiated as a process of stakeholder participation in a public project.

Table 4: Factors Characterising Case Studies with Higher Pressure on Agricultural Land (own elaboration).

Cases / Parameters	Aso Valley (IT)	Dommel (BE)	Frisia (NL)	LBs (NL)*	TrC (BE)*	GWP (NL)*	KBR (BE)*
Ownership of land	farmers	farmers	farmers	farmers	farmers	public/ NGOs	public
Initiation	mixture	mixture	mixture	mixture	mixture	top-down	top-down
ES targeted	water quality, bio-diversity	water quality, bio-diversity	water, bio-diversity, landscape	water quality, bio-diversity	water storage	bio-diversity, water quality	flood control, bio-diversity
Source of funding	public (AEP)	public (AEP among other)	public (AEP among other)	mix of public (AEP) and private	public	public (AEP among other)	public (AEP among other)
Contracting	farmer-agricultural authority	farmer-project leader	farmer-group	farmer-group	farmer-project leader	farmer-group (among other)	farmer-group (among other)
Implementa-tion and monitoring	individual	individual	joint	joint	individual	joint	joint
Type of approach	coordinat-ed	coordinat-ed	collaborat-ive	collaborat-ive	coordinat-ed	collaborat-ive	collaborat-ive

Finally, Figure 10 below shows the classification of all cases found on the coordination-collaboration spectrum provided by PRAGER (2015a). The allocation can only depict a tendency as cases are in fact multi-facetted and dynamic. Nevertheless, there is certain evidence that the combination of top-down and coordinated approaches appears in cases with primarily public benefit, whereas the combination of bottom-up and collaborative

approaches emerges with increasing private benefits. The specific cases of conservation areas constitute an exception.

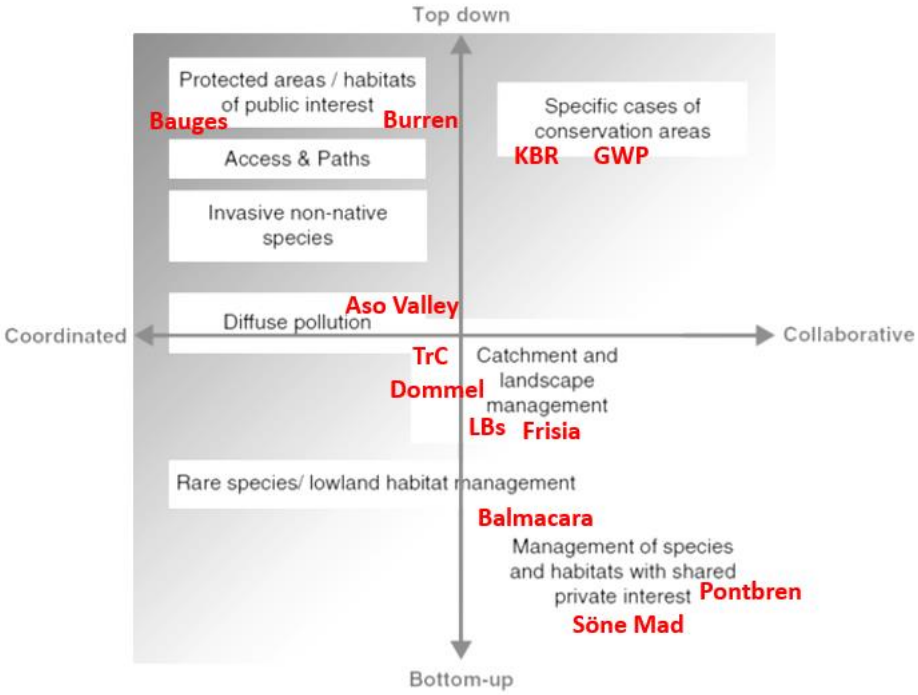

Figure 10: Case Studies Classified in the Coordination-collaboration Spectrum (based on PRAGER (2015a)).

The case study overview shows the scope of different landscapes, social circumstances, goals and arrangements in which cAEP operate. Next to differences, one can observe similar patterns and interdependencies of which some formed a basis for the hypotheses made and will also enter in the discussion. The author notes that the overview at hand is rather a spotlight on the case studies and aspects to be analysed. The in-depth analysis focuses on cases in areas with higher pressure on land of which two are related to the establishment of nature reserves.

4.2 In-depth Results from Empirical Case Studies

4.2.1 The Change to a Collective AEP in the Netherlands

In the Netherlands, a high proportion of land is used for agriculture despite of a relatively large population density (RUNHAAR et al. 2016). Accordingly, **pressure on agricultural land** is high, resulting among other from designation of land to nature reserves. Many farmers traditionally oppose nature elements and extensive farming because they perceive it as a threat to their businesses (NL02, NL05, WESTERINK et al. 2015). The first agri-environmental policy was introduced in 1975, with two different approaches. Firstly, the creation of nature conservation area by taking agricultural land out of production or having farmed nature areas. Secondly, compensation payments to farmers who implement nature conservation measures, with a focus on meadow birds. However, both the approaches were barely successful since many farmers **refused to sell their lands** and **rejected to engage in measures** (RUNHAAR et al. 2016). These problems remained along with the introduction of an ecological network structure in 1990, to which the AEP was adapted. In line with other EU countries, the Dutch AEP provided for a menu of measures designed by the national government who contracted individual farmers (ibid.).

However, next to the development of public policies, and partly as a reaction to top-down governance, farmers started to self-organize in **environmental cooperatives (ECs)** in the 1990ies, aiming at more responsibility and freedom in implementing measures (RUNHAAR et al. 2016). The most popular EC is the Northern Frisian Woodlands association because it was a pioneer in self-organizing conservation measures and later cooperating with researchers who were funded by government as the EC gained in attention through increasing success (TERMEER et al. 2013). In reaction to the growing number of ECs, the government aimed at transferring the AEP to be compatible for collective contracts recognizing their institutional advantages. A **collective approach to AEP** was tested in four pilot regions from 2011 to 2014, and due to efforts of the Dutch government the group option was introduced at EU-level (WESTERINK et al. 2015, TERWAN et al. 2016). After the government decided to fully transfer the Dutch AEP to a collective approach, 40 new collectives were established as legal entities and certified as conservation organisations by 2015. The old cooperatives merged to a large extend in these new farmer collectives '**Agrarische Natuurvereinigingen**' (**ANVs**) (RUNHAAR et al. 2016, TERWAN et al. 2016).

From 2016, the AEP was substantially revised. Farmers are now required to be organized in one of the 40 ANVs to apply for the programme, which is still voluntary. The approach is often described as a **front-door-back-door principle** (NL02, TERWAN et al. 2016). The collectives develop and propose bids to the provinces and they contract them 'at the front door'. The contracting of individual farmers is made with the collective 'at the back door'. Hence, the ANVs perform the local fine-tuning of conservation measures and payments needed to reach outcomes at landscape level. Furthermore, an important change was the focus on **core areas** that are promising from an ecological perspective (RUNHAAR et al. 2016). A regional plan determines all possible areas for different fields of conservation, e.g. for bird protection. This selection is performed by the provinces which set regional targets in accordance with national targets, based on EU directives (NL02).

In line with designated areas, the collectives submit a **project plan** that is checked and used as a basis for budget allocations by the provinces, which contract the collectives for six years. Additionally, the collectives are required to submit an **annual management plan** (NL02, TERWAN et al. 2016). For receiving the annual payment, the collectives send a request to the governmental agency Rijksdienst voor Ondernemend (RVO). They provide for a digital system, where every farmer continuously reports on measures and the collectives send a record on all measures applied per year (RVO 2018). RVO initiates on-field controls on 5 percent of the collectives each year (NL02). Also, the collectives conduct on-field **monitoring** and involve in ecological guidance. In this way, the risk of insufficient management is reduced and possible adjustments to the contracts are detected. The collectives are required to control their own farmers as well as controlling other collectives (NL03, TERWAN et al. 2016).

Goals of the new Dutch AEP are increased ecological effectiveness through cross-farm coordination at landscape-scale and increased efficiency through a reduction of governmental implementation costs. These are **shifted to the collectives** which are assumed to have lower transaction costs for contracting individual farmers (NL01, NL02, TERWAN et al. 2016). However, long-term evaluation and monitoring is still pending. Although RUNHAAR et al. (2016) classify the new system as public-private governance, many ANVs **operate within a wider network** of actors, including also stakeholders of civil society. For example, by cooperating with nature organisations, research, or water boards they can be classified as collaboratives.

4.2.1.1 The Project ‘Levendige Boerensloot’ in the West of Utrecht

Area and context

The rural west of Utrecht belongs to an area known as the Green Heart and is located between highly urbanized areas. The lands are mainly owned by farmers having cattle on pastures that are intersected by many small ditches as part of an artificial, historical canal system for drainage. Farmers have always been involved in maintaining the ditches by dredging and cutting vegetation alongside the brooks (NL01). With ongoing agricultural intensification, many farmers **fear of losing land** to nature protection areas resulting from economic pressure and land scarcity as well as cases of farmers who were expropriated (NL02, NL03). However, some farmers engaged in **ECs** for the protection of meadow birds since the area is of high importance for species like godwits and lapwings (NL02). Moreover, ECs in the province started a **pilot project** in ‘Green-Blue Services’ in 2008. They created walking paths, little woods and tested ecological maintenance of ditches and water storage (NL03, GROENBLOUWE DIENSTEN UTRECHT WEST 2008).

Actors of collaboration

The farmers of the collective Lange Ruige Weide, which was in the pilot project, merged with three neighbouring ECs to the ANV Rijn and Gouwe Wiericke. They still have their own boards and some own activities. The ANV operates at the boarder of **two provinces** resulting in some farmers working with the Province of Utrecht and others with the Province of Zuid-Holland (NL03). The Province of Utrecht is the responsible authority in this case for developing the ‘natuurbeheerplan’, the designation of suitable areas for four fields of conservation. The most important civil actor is the **water board** Hoogheemraadschap de Stichtse Rijnlanden (HDSR), a large organisation which operates many different projects and services within the region. Since it has a management board involving different political parties as well as representatives from economy, agriculture and nature organisations, the water board is in the farmers’ confidence (HDSR 2018).

Initiation

Resulting from successful involvement of farmers in the pilot project, the water board initiated a new project called ‘Levendige Boerensloot’ in 2014, when ECs merged into ANVs. It aimed at changing the practice of ditch maintenance to improve biodiversity and water quality. In using new techniques and machines, the implementation of water framework goals should be facilitated (NL01). Along with the Dutch AEP revision in 2016, **water was added as a field of conservation** by the province since water measures

are also connected to bird conservation (NL02). The availability of governmental funding enabled the collectives to scale up the cooperation with the water board. The farmers' additional interest in the measures is to ensure stability of the banks and fertilisation by nutrients from the ditch being spread onto their fields (NL01).

Contract and implementation

Firstly, there is one contract between collective and province, while individual contracting of farmers is made with the collective. The **package of measures** for water conservation encompasses ecological ditch maintenance by using a ditch pump for dredging that spreads the mud onto the field, careful mowing on the edge of the bank and provision of buffer zones. This maintenance is done once a year, by contrast with every five years for the conventional way of dredging. On average, farmers get 130 euro per km of ditch per year which is now equally funded by HDSR and EU (NL01, NL03). The province is the contracting actor combining this package with other measures applied, but they cooperate with HDSR on checking submitted plans of the ANV. They have annual meetings with all stakeholders but contact between collective and water board is more regular because it has an advisory character (NL01). Monitoring is carried out by the collective itself and the governmental agency who mainly check whether mud from the ditch is at least two metres away from the edge (NL01, NL03). Secondly, an additional contract between HDSR and a few farmers, who already participated in the pilot project, is on an **extra monitoring**. The water board pays them to count species and measure water levels. This monitoring is two times per year and usually carried out jointly by a farmer and a volunteer (often becoming ecologists), in addition to professional controls delegated by HDSR (NL01, NL03).

Outcomes

In 2014/2015, 17 farmers participated and after water conservation was introduced into the natuurbeheerplan, more farmers became involved through the collective covering now 15 percent of the area (NL01, NL03). Experience with collaboration on water measures due to pilot projects in the province helped to increase participation (NL02). Most importantly, there is **one farmer encouraging others** through his function as a board member and the conduction of on-farm demonstrations. He also changed to a traditional cow type adapted to extensive farming (NL03). However, the level of uptake is stagnating now and there is a tendency that large farms remain uninvolved (NL01, NL02). Regarding **ecological outcomes**, number and diversity of plants and small animal species on the ditch edge increased. The development of water plants is moderate (NL01). Also, the

decrease in numbers of meadow birds is only reduced (NL02). However, there is a rise in awareness of nature among participating farmers, especially due to the monitoring whereby results are directly visible (NL01). The water board started **new projects** on water storage and sustainable soil management with motivated farmers from the pilot group building on mutual trust and experience (NL01, NL03). In general, relationships between all stakeholders and among the farmers are described as good. Despite of starting problems in communication and decision making when four organisations merged, the ANV professionalises, e.g. by hiring administrative support (NL03).

Challenges

A major obstacle are difficulties with the shift of governance tasks to the collectives in combination with a lack of compensation. The collectives are dissatisfied with the amount of **administrative work**, although 20 percent of the subsidies are foreseen to cover these costs (NL02, NL03). Due to requirements of transparency, the complex digital reporting system was established by RVO under initial software problems (NL01, NL02, NL03). Especially, for on-field monitoring, collectives are required to carry out monitoring without receiving extra compensation (NL03). However, the internal monitoring helps to avoid mistakes and the fear of not being paid that is still problematic (NL02, NL03). All interviewees pointed out that **time is needed** for the collectives to professionalise more and for farmers to change their mind sets and traditions, but also to make investments like buying adequate machines, although they can be shared. Moreover, **trust** is still to be improved, also in the farmers' efforts, but the complex control system currently undermines **flexibility** of the collective: "*And it was said that those collectives (…) will be responsible for the contract with the farmer but in practice that is not the case and that is a serious problem. Although it was said that the collective has a back-door and a front-door procedure, in practice each individual measure needs to be communicated (…) and approved*" (NL03). Many farmers decided to apply measures without contracting, because they see no benefit in receiving subsidies in relation to the administrative effort (NL03). Furthermore, there is a discussion about the designation of focus areas. Ecologists opt for an improvement in ecological quality of areas under contract, e.g. by higher water levels, but many farmers opt for more quantity of measures by increasing the number of designated areas (NL02).

4.2.1.2 The Programme 'Veenweiden Gouwe Wiericke'

Area and context

The area of Gouwe Wiericke is part of the 'Green Heart', a lowland area with pastures intersected by a network of ditches and drained for centuries. The waterways and moist grasslands provide a habitat for sensitive bird species like the black-tailed godwit (WESTERINK et al. 2017a). The largest part of Gouwe Wiericke is in the Province of Zuid-Holland. In line with the EU habitat directive and water framework directive, many lands in Gouwe Wiericke became an important part of the Natuurnetwerk Nederland (NNN). An implementation of the network requires a **corridor of wetlands** through primarily agricultural land (ibid.). One important part of 290 ha NNN is in the north of Bodegraven, where many farmers are active of which about 30 currently use the lands of interest to implement the nature reserve. In general, farmers own lands outside the NNN-area (often adjacent to it) but also rent land within the area. Due to the phosphate legislation attaching the number of cows to number of hectares, the importance of available land increased for farmers. This pressure is on top of a general **scarcity of agricultural land** since the area is surrounded by highly urbanized areas. Thus, farmers oppose a designation of lands to nature because this implies a change to extensive farming and coping with higher water levels. The resulting conflict is emotionally charged (NL04, NL05).

Actors

Multiple stakeholders are involved in the conflict: the province, municipalities, water boards, agricultural and nature related organisations. The water boards, HDSR and Rijnland, are service providers for all water related issues in the region. They regulate water levels and improve water quality but are restricted in implementation without a commonly accepted plan. HDSR is responsible for the area of Bodegraven (NL04). The nature-related organisations, Natuurmonumenten and Staatsbosbeheer, own most of lands relevant to the corridor but lend them to farmers (NL05). The agricultural parties, a local organisation of the farmer union and 'De Parmey', the **farmer collective** in Bodegraven, **oppose** the corridor. The collective formed in 1997 and is engaged in providing landscape elements and bird protection. In a report from 2008, they emphasize existing efforts and ecological achievements, while raising concerns about the possibility to reach targets of the NNN (DE PARMEY 2008). The agricultural parties are supported by a majority within the agricultural community that is strongly represented by local political movements. This lead to a **conflict between municipalities and province** who is required to implement ecological targets of the national government and EU (NL05).

Initiation of the collaborative approach

Limited success in buying land for about 20 years, changes in legislation and staff involved, as well as budget cuts, resulted in a change of strategy by the province in 2010. They **invited the municipalities** to develop their own plan to realise the NNN-objectives. But a lack of ecological ambitions in the resulting plan prevented from an agreement (NL05). The province also invited a **team of researchers** from Wageningen University to engage with stakeholders by organising and mediating meetings and information events. While ANVs and water boards achieved contracts in a pilot project on ecological ditch maintenance for 2014/2015, the province refrained from participation in funding due to internal inconsistencies between departments (WESTERINK et al. 2017a). However, the province made a proposition to municipalities and water boards to form a **leading platform** for the implementation process. In 2016, stakeholders signed a contract in which they committed themselves to reach the goals of the nature network (NL05).

Contract

The board of the programme 'Veenweiden Gouwe Wiericke' represents all relevant stakeholders and the programme combines three individual plans on **nature, agriculture and recreation**. These plans cover a wider area of which part is relevant for the ecological corridor (NL05). Special **instruments** were developed to come to an accommodation with farmers. Firstly, the province guarantees the level of subsidies for conservation measures for 12 years. There are subsidies for a change of designation to nature which is linked to major changes in the farming system and for the application of conservation measures through the ANVs. Secondly, the province helps farmers to rent extra land if farmers install landscape elements. Moreover, in cases of relocation or termination of business, help is organised to search for other lands, buy the lands, or to aid with the relocation. Also, costs for agri-ecological advice are absorbed (NL05, PROVINCIE ZUID-HOLLAND EN DE STUURGROEPEN VEENWEIDEN 2017). The participative planning process includes regular stakeholder **meetings** and personal advice and information events for farmers, such as discussion evenings or excursions to regions where farmers perform 'nature-inclusive' agriculture (NL04, NL05). The ANVs contribute to the development of the programme plan while continuing the coordination of conservation measures within the AEP (STUURGROEP VEENWEIDEN 2017).

Outcomes

The ecological corridor is not implemented yet since **negotiations are still in progress**. In areas with less number of farmers, they achieved arrangements for relocation or a

change in farming business. In these areas, the implementation process started. However, in the part of Bodegraven where many farmers are, the creation of individual solutions is ongoing (NL05, STUURGROEP VEENWEIDEN 2017). Reasons are the scarcity of land and that farmers' resistance remained, although some recognized the opportunity to participate in an agreement originating from the entire region (NL04, NL05). Thus, a **smaller commission was established** including four representatives from agriculture and one representative each from municipality, HDSR, Natuurmonumenten and province. They negotiate on a plan starting from no-regret-measures and achieved that stakeholders listen to each other in regular meetings, compared to the situation before, building mutual understanding for difficulties and boundaries (NL04, NL05).

Challenges

A major challenge is the creation of **trust**. The provision of guarantees and help by the province is an attempt to prove **reliability** to the farmers, as a basis for investments. The province acknowledges that a lot of former changes in national policies created uncertainty (NL05). A second challenge are **limits of the participative process**. For the programme, the parties signed to finish implementation of the corridor in 2021. Therefore, the **designation** of all areas within the borders of the NNN need to be changed from agriculture to nature. Thus, for Bodegraven, the province demands a decision on this by the municipality reminding them on the agreement they signed (NL05). However, most representatives in the municipality want to continue bargaining and remain a veto right for farmers. "*What they want is the opportunity for the farmer to always say no without any consequences. Then I would be bargaining for the next ten years because he might always think, "maybe there is a better deal than I got right now"*" (NL05). Indeed, the aim of the participative process is not efficiency but nevertheless, the ecological corridor is a public project to be implemented at some stage (NL04). Employees of the province or water board are paid for the large amount of time required, but **for farmers it is extra work**, especially for the ANVs, on top of the amount of administrative work with the new AEP. Hence, representatives from the farmer groups receive a payment as a compensation for their participation (NL05).

4.2.2 AEP in Flanders and the Evolvement of Collaborative Approaches

In Flanders, pressure on agricultural land is high due to demographic density and different stakes. Especially, interests between nature-related and agricultural parties are diverging as demand for nature reserves and ecological farming practices rises. Farmers usually have **negative associations with nature** (BE01). They fear expropriation and limited economic sustainability of their businesses. Many farmers refrain from agri-environmental contracts because they fear possible sanctions. Due to the fragmented structure of agricultural land with borders that are often not straight, probability of errors in management is increased (BE01). Agri-environmental measures are 'agromilieumaatregelen' covering reintroduction of old breeds or animal welfare and '**beheerovereenkomsten**' (BOs) focusing e.g. on management of landscape and biodiversity. The first ones are half-financed by the Department Landbouw en Visserij, the agricultural agency, while BOs are half-financed by the nature-related agency Vlaamse Landmaatschappij (VLM) (BE01, DEPARTMENT LANDBOUW EN VISSERIJ 2018). Although the **group option** of the CAP was introduced into Belgian law in 2015, it is not fully implemented yet due to **administrative difficulties**. The payment system is still on an individual basis and control mechanisms and sanctions are not adapted to group contracts (BE01, WESTERINK et al. 2017b).

During the last 20 years, some initiatives tried to bridge agricultural and nature-related interests by creating multi-stakeholder groups, e.g. in the Dommel valley. Experiences from these initiatives formed a basis for the development of **Agrobeheercentrum Eco² (ABC Eco²)** (BE01, WESTERINK et al. 2017b). The beginning of ABC Eco² was an EU-funded project from 2008 to 2010. A few employees from the farmer union cooperated with the VLM on establishing six groups of farmers for nature conservation. The follow-up project for another two years was named Eco², which means economy combined with ecology. This represents the approach and shows the importance of **framing**. The same applies to the name of the groups: "*The inspiration for the groups came from the Netherlands where you have the 'Agrarische Natuurvereinigingen'. But it looked too much as nature organisations and it was difficult to get this introduced to the farmer union. So, 'management group' was a more neutral term.*" (BE01). An increase to 16 'Agrobeheergroepen' (ABGs) was achieved during that time. In 2012, they founded the non-profit organisation ABC Eco² which is now stimulating farmers to cooperate on nature conservation and functioning as an umbrella organisation for the farmer groups supporting them with organisational tasks (BE01). WESTERINK et al. (2017b) highlight

the **hybrid identity** because different stakeholders are represented in the board: agricultural and nature-related governmental organisations, two farmer unions and at least one farmer from an ABG of each of the five provinces.

Currently, there are 31 ABGs working on landscape management and nature conservation measures. These informal groups have a management board which is elected every five years (BE01). Measures depend on the region but are usually options from BOs designed by the government. **Spatial targeting** is achieved by coordination through the ABGs, without official registration in management plans (WESTERINK et al. 2017b). The initiative often comes from the farmers in reaction to a local problem or, sometimes, from the VLM (BE01). The ABC Eco² develops **win-win-solutions**. For example, one of the first groups was on the management of hollow roads, tree-lined roads between fields that were historically maintained by farmers who used the wood for heating. They convinced farmers to reactivate the management because they would have less shade on the field and could better pass with tractors. *"We found that there was some subsidy on the maintenance of these elements, but the subsidy was only applicable if you do the management of the whole line of trees, of the whole landscape element. So, we had to convince many farmers to apply for this subsidy and then we arranged the management in the group (…) There were farmers who didn't want to do the work but if another farmer likes to do it and he can earn some money (…) coming from the subsidy of the others, then it's a win-win."* (BE01). As a group application for subsidies is not into practice yet, group members usually keep the part for income forgone of the subsidy they receive while passing on the management-related part to the group. The farmer who in fact did the management is paid from this. Legal contracts between individual farmers and the group are facilitated by '**werkers in aanneming**', a special purpose company which provides assurances and machinery for associated farmers (BE01). For redistributing and coordinating, ABC Eco² receives a small part of the payment (WESTERINK et al. 2017b). Next to financing, there are co-operations with other organisations, especially on technical advice and research.

Relationships and social aspects play a crucial role. ABC Eco² uses network structures of the farmer union at local level to introduce their ideas. To prevent from a negative setting, **trust** of the local farmer union coordinator and the most influential farmers is important (BE01). Moreover, ABC Eco² tries to keep ABGs small (10-20 farmers) to benefit from social cohesion and trust between the farmers reducing the risk of non-cooperation or bad management (BE01, WESTERINK et al. 2017b). Another principle ABC Eco² works on is **facilitating learning**. The ABGs are a good forum for both vertical and horizontal

knowledge transfer, because farmers feel more confident about exchanging knowledge on environmental issues. Additionally, farmers are encouraged to specialise on different subjects, so the group increases in professionality and decreases errors. This contributes to the idea that ABGs exist for long-term enhancing continuity in management (BE01).

The aim of ABC Eco² is to establish new groups, but also develop new projects with existing ones. For example, the first group who worked on hollow roads has expanded in that they produce wood chips for heating and improving soil quality (BE01). Diversification in tasks and partnerships is also a strategy to contribute to **sustainability of the groups**. However, the work of ABC Eco² is restricted to their budget mainly originating from the farmer union and the nature administration. Another financial source are EU co-funded projects like Interreg or LEADER[12] (BE01). For the future, ABC Eco² suggests administrative implementation of the group option with **funding for the advisory** behind groups to compensate for higher transaction costs. The complicated, time intensive way of contracting should be replaced by **official group contracts**. Payments for individual income forgone and management-related payments should be split and accordingly the control and penalty system. The fear of getting punished due to others' mistakes is still a barrier for farmers to cooperate (BE01).

4.2.2.1 The ABG Essen-Kalmthout and the Triple C-project

Area and context

The area in the North of Antwerp is in the catchment of the river Kleine Aa which enters the Aa of Weerijs crossing the border to the Netherlands. The flat area is characterised by sandy soils that tend to be dry and prone to erosion. Increasing **extreme weather events** resulting from climate change are problematic to farmers by enhancing their vulnerability to droughts, but also excess water and erosion. The fields are often fragmented and crossed by small streams and ditches (BE02, VLAAMSE MILIEUMAATSCHAPPIJ 2018). After project acquisition by ABC Eco², the area is now attached to the **cross-border project for climate change adaptation**, Triple-C, which is funded by the 'Interreg 2 Seas' programme for United Kingdom, France, Netherlands and Flanders, co-funded by the European Fund for Regional Development over the period 2014-2020. Triple-C stands

[12] LEADER is an EU funding initiative for rural development.

for ‘climate resilience’, ‘catchment-based’ and ‘community-based’, fitting to the spatial coordination and collaborative approach of ABGs (VMM 2018).

Actors of collaboration

The Flemish environmental agency VMM and the Province of Antwerp are responsible governmental parties. ABC Eco² coordinates between them and the farmer group but also within the ABG. Most of the farmers in the area, including the farmer interviewed, have milk cows and cultivate maize. The ABG Essen-Kalmthout was formed in 2012, by ten farmers, following the example of the neighbouring ABG Wuustwezel. This ABG was formed in 2008, to **reactivate groundwater level regulation** by placing dams in the ditches alongside their fields. The installation of the dams was spatially coordinated and jointly implemented by the group. A former EU-project from the 1990ies already placed dams in the entire region, but due to a lack of guidance to farmers, many dams broke and disappeared. The ABG Essen-Kalmthout also started a project on the restoration of a few dams and put them back into use (BE02).

Initiation

The new project provides funding from the Province of Antwerp and the EU for further installation of dams (BE02). The intention of Triple-C is to increase water storage in catchment areas and therefore aims at spatial coordination by cooperating with farmers who own almost all small streams and ditches crossing their lands (VMM 2018). Involving farmers’ experiences and knowledge about the area is beneficial in installing dams at suitable sites. The earlier EU-project proved that the uptake of water level management was not sufficient after an external programme installed dams without integrating farmers. At the **start of Triple-C in 2016**, ABC Eco² approached the ABG Essen-Kalmthout and convinced them to participate, but the project also targets individual farmers in the catchment area (BE02). They receive subsidies to build dams in the ditches alongside their fields enabling them to regulate water levels. This is in their own interest to meet water scarcity in the summer and soil erosion. Holding the water also in cases of extreme rainfall is in public interest to prevent from flooding. In addition, farmers collect data on water levels which is gathered by the province to improve existing erosion and flooding models (BE02, VMM 2018).

Contract and implementation

Joint working is barely necessary since the measure is installation of dams in the streams next to fields. There are two options to install the dams. The first is an implementation by

a professional company paid by the government. The second option is an implementation by the farmers themselves, with full absorption of costs through the project. Additionally, the farmers get 50 euro per year for regular **control of water levels** on installed monitoring pipes and **collection of data** for the province (BE02). Moreover, the farmers are required to close the bulkheads of dams in cases of flood risk. Normally, farmers would close them after sowing maize during the summer and open them before harvesting. The additional task for the farmers is to sometimes close the bulkheads during the winter period to prevent townships from flooding. Due to multiple bulkheads, there are intermediate stages enabling the farmers to exactly adapt the water levels required which they decide on their own at this moment. A system of advisory communication about the impulse management is operational (BE02). Currently, the ABG meets one time per year together with the province to communicate water levels. Relationships between all actors are good, but it should be emphasized that it is mainly individual work. Sometimes farmers are required to negotiate on the exact location of a dam when the ditch is at the border of their properties (BE02).

Outcomes

To date, the project proceeds smoothly, but there is still potential for uptake of the measure (BE02). The farmer interviewed stated that other farmers are less interested because they are not used to problems with droughts and do not consider the problem of increasing droughts in the summer due to climate change. "*They say "we can use irrigation pumps then", but it could happen that the government stops it when drinking water gets scarce*" (BE02). Although this situation almost occurred in 2016, many **farmers are not aware** of this threat. However, the farmer interviewed is not involved in convincing others. Regarding awareness, the project coordinator of ABC Eco² points out that even this farmer did not mention the impact of his management for the entire region, e.g. flood protection for townships by closing the gate in the winter, if necessary. This indicates the problem that many farmers only consider impacts on their own area (BE02).

Challenges

Next to issues related to awareness and participation, there are challenges in the contract originating from the categorisation of water streams: category one and two are attached to rivers and category three and four to small streams and ditches. Despite of being owner of the ditches, farmers are not allowed to construct dams within category three due to regulations on **fish protection**. However, the farmer interviewed stated that there are often no fish to protect. The project coordinator confirmed this discussion and that there

might be no point in a general restriction for category three (BE02). For the farmer a relaxation of regulation would be a significant difference. He could build five to six dams in category three resulting in about 15 ha being better supplied with water, which is half of his land (BE02). Another challenge mentioned is **administration costs** due to construction permits required for every single dam. Furthermore, additional solutions to future water scarcity in the summer are to be considered, according to the project coordinator. This could be, for instance, the use of treated wastewater on fields (BE02).

4.2.2.2 The ABG Kruibeke-Bazel-Rupelmonde in the Polders of Kruibeke

Area and context

The polders of Kruibeke, Bazel and Rupelmonde are at the river Scheldt, close to Antwerp. The area is part of a **flood defence strategy**, drawn up in 1977, as a reaction to two severe floods. This plan encompassed flood retention areas along the Scheldt, but in Kruibeke a strong local **resistance** hindered an implementation on the lands under agricultural (400 ha) and recreational use (BE03, BEHEERCOMMISSIE NATUUR 2014). The decision to an integrated planning including Natura 2000 goals was made in the 1990ies, while the conflict with local opponents remained. However, in 2001, an Environmental Impact Assessment for the construction of a dock in Antwerp featured the polders of Kruibeke as a compensation area. A construction permit was issued for the implementation of a nature reserve for meadow birds with flood control function. Eventually, **negotiations** between authorities and farmers opened because the farmers realised the chance to be part of a solution by cooperating and the responsible authority was motivated to involve inhabitants (VIKOLAINEN et al. 2013). The updated plan from 2005 aimed at **multifunctional goals** including flood security, nature, agriculture, and recreation. A management commission was installed as a **stakeholder platform** responsible for the implementation process. By the end of 2009, a management **agreement** with 43 out of 72 expropriated farmers was signed. The construction of dykes and sluices finished in 2012 and operations of flood control started by 2015 (BEHEERCOMMISSIE NATUUR 2014).

Actors of collaboration

The management commission represents multiple stakeholders who also cooperated on other local agri-environmental projects evolved over time. Nature-related governmental organisations are VMM and VLM, but there is also ‘Waterwegen en Zeekanaal’ of the ministry of mobility and public works who now owns the area and constructed dykes and

sluices. Moreover, the municipality of Kruibeke and the Province Oost-Vlaanderen are represented. An important civil actor is Natuurpunt Vlaanderen, a nature protection society. Farmers are represented by two farmer unions, plus the regional coordinator from ABC Eco² (BEHEERCOMMISSIE NATUUR 2014). He lives in the region and supported the group from the beginning on, so he knows all farmers from the area and is in their **confidence**. Together with the chairman of the ABG he is an important **voice** for them in the meetings (BE03). Currently, 18 farmers are officially assigned to the ABG, but in fact there are 30 involved in the meadow area, each of them managing around seven hectares with dairy and meat cows, in addition to areas outside the nature reserve that are managed conventionally (BE03).

Initiation of the ABG and related projects

During the process of negotiation, some farmers approached the advisors who later became ABC Eco² for help with including nature goals in their farming and they **formed an ABG in 2009**, as one of the first groups in Flanders. The nature administration was sceptical whether this would help and afraid that farmers are brought together to renovate the opposition (BE01). ABC Eco² started to organise **educational events** for the farmers, e.g. a bus trip to the Netherlands to talk to farmers who integrated nature targets into their farm businesses. The **scepticism** from the nature administration was used as an argument motivating the farmers to prove their reliability. Moreover, the **chairman** of the group played an encouraging role. Together with advisors from ABC Eco² he reached the final management agreement for the farmers. As the nature administration started to appreciate the work of ABC Eco², they supported the ABG in the following project on ecological management of field edges (BE01). This project emerged due to the regulation to keep distance of one metre to small streams with the application of pesticides, but also with ploughing (BE03). Furthermore, the group became involved in a project for farmers cooperating with other local inhabitants on creating flower strips on fields and in townships of the entire province (BE03).

Contracts

Firstly, the management agreement is part of a **compensation** to farmers. They can still use the meadows for free and have the first right to be ascribed to plots. Secondly, their management maintaining the areas' character needed to attract meadow birds is of **interest for governmental organisations** (BE03). Paying an external company to mow the areas would bear extra costs compared to the option of a contracting the farmers. The same applies to mowing of dykes, a total area of 46 ha of grass, for which farmers receive

a payment (BE03). The agreement further regulates practices in accordance to requirements from the nature reserve. Pesticides and fertilizer are prohibited and the combination of mowing and grazing on the parcels is to be coordinated to provide sufficient shelter and food for meadow birds (BE03, BEHEERCOMMISSIE NATUUR 2014). The ABG meets in February to **schedule the mowing** on different parcels. The mowing of dykes is done by five farmers from the group who are associated with werkers in aanneming and receive 700 euro per hectare. A machine is lent from a machine cooperation by the group (BE03). The regional coordinator from ABC Eco² represents the farmers in the management commission. Moreover, he organises **knowledge gathering** in events for the farmers with different subjects and external experts invited. Also, cooperating with researchers on monitoring the energetic value of the grass and economic calculations is an important task for triggering farmers interest and weigh possible adaptations on the agreement as an addition to the overall monitoring of the polders (BE03). In the other project on field edge management, they test a special mowing machine funded through the municipalities and a LEADER project. For the flower strips project, ABC Eco² supported farmers in the group as well as individual farmers to apply for related BOs from the VLM (BE03).

Outcomes

The Special Area of Conservation encompasses now 300 ha tidal inundation area of mudflats and salt marshes, 150 ha grassland, and 150 ha of forests, plus cycling and walking paths, and a compensation area for anglers. The area is surrounded by an inner and an outer dyke with seven sluices. The smaller ones let water in and out with the normal tide, mainly to keep the meadow area wet, but also for flood control at spring tides. One big sluice floods the whole area in cases of serious flood risk. The wet character of the grasslands attracts meadow birds like lapwings, black-tailed godwits, redshanks and oystercatcher, which lead to the additional status of a Special Protected Area (BE03, BEHEERCOMMISSIE NATUUR 2014). Although agricultural activities were maintained in the polders, the **number of farmers** decreased from about 70 to 30, because the remaining 150 ha grassland was only interesting to cattle farmers. The grass has a lower energetic value compared to grass from meadows where fertilizers are applied. Farmers only use it for the calves' feed mixture and thus are not interested in large plots on the area. They accept management regulations from the agreement, although they are not satisfied with every detail (BE03, BE04). Concerning **social relationships**, the farmers know each other better now, communicate beyond official group meetings and learn from each other. Additionally, their **valuation of nature** increased (BE03). Regarding the other

projects, the regional coordinator is satisfied with design and uptake by farmers which increased "*also (…) because they do it for their image. They want to show that they do something for nature*" (BE03).

Challenges

A major problem is the **decreasing energetic value of the grass** resulting in diminishing economic interest of the farmers in the meadow area, which is undermined by economic calculations initiated by ABC Eco². The regional coordinator therefore discusses with other stakeholders about introducing a **payment** for the maintenance of the meadow which is not successful yet, because they could rather search for other, extensive farmers who are interested in using the area (BE03, BE04). During the information events ABC Eco² also tried to introduce the option of changing to a **cow type** better adapted to wet areas and extensive grasslands, and benefit from labelling. But according to the regional coordinator, the interest will probably not rise until a few years (BE03). The farmer interviewed emphasized that he will not change his cow type, because that is not interesting to dairy farmers, compared to farmers who could sell meat from a special cow type (BE04). Another option is adaptations on management regulations in the agreement. From a trip to a meadow bird area in the Netherlands, the farmers learned that they **allow for some fertilisation** in the form of manure to increase life in the soil and maintain the meadow character. The farmer interviewed is positive that the Flemish administration will also discover this at some point, like they realized the necessity of coping with foxes when they started to harm the birds (BE04). Another problem concerning the agreement is that farmers are not allowed to **cover the soil with reed** during the winter, like they used to do on all their lands. In the meadow area, they are required to mow the reed, which is difficult the more wet it is, and pay to give it to a biomass plant. This circumstance could be a supporting argument for paying a subsidy to the farmers for maintaining the meadow (BE04).

5 Discussion

5.1 Implications on Design Characteristics

H1: holistic approach (several ES) better than single goals

All empirical case studies target several ES that partly represent **diverging interests**, such as flood control and food provision in KBR. In the interviews, it was often referred to combining ecological and economic goals (NL05, NL02). PRAGER et al. (2012) highlight that it is imperative to embed the ES approach within other frameworks which are useful to connect stakeholders, like Green-Blue-Services or Eco². A balancing of interests was a driver for all initiatives and win-win solutions enhanced *benefits of applying measures* (cf. determinant g in Figure 8, section 2.2.1). Additionally, *perception on the scheme* and *willingness to undertake measures* (cf. determinant c in Figure 8) was improved in LBs and KBR. However, in KBR and GWP, the balancing of different stakes also led to an increase in *complexity* (determinant d) negatively affecting TCs. Despite of this restriction, H1 could be accepted for all cases analysed, especially for increasing effectiveness (cf. Appendix 4). **Trade-offs** between ES are reduced to some extent in all cases indicating a better fit to the area. Though in KBR, the decrease in quality of grass challenges continuation of the initiative. Regarding **sustainability**, examples from literature showed that integration of different goals can result in additional marketing opportunities initiated by the farmers (e.g. Söne Mad, Aso valley). Likewise, in LBs, the farmer interviewed changed to an old breed. By contrast, in KBR and GWP, project coordinators try to foster farmers to profit from organic labelling.

Nevertheless, it is important that motivations of actors are not restricted to **economic attractiveness**. MILLS et al. (2018) found that intrinsic motivations like a personal interest in wildlife, social concerns about pollution, and reputational effects where important for farmers undertaking unsubsidised measures. KBR showed that even if feasibility is decreasing, farmers continue to manage the meadows because they have also **other motives** such as identity and habit, conflict solution and reputation (BE03). Likewise, the farmer in LBs recognizes societies' demand for provision of landscape elements and included this into his farm business: "*I think the time when farmers were just there to produce milk, that's gonna be history. You also produce landscape and create an environment for those kids to have a place to live in*" (NL03). Interestingly, the case of TrC indicated, that a lack of awareness and understanding of the whole set of goals among farmers lead to an understatement of the projects' relevance and could restrict uptake

(BE02). The importance of environmental awareness among farmers may depend on the type of approach. In coordinated approaches, this is compensated if private incentives lead to a sufficient level of participation (EI, BRENDLE 2000). The more collaborative the approach, ecological awareness and social aspects become important motives for farmers to participate (EI, MILLS et al. 2011). This is in line with VATN (2016) stating that farms often maximise utility of the family rather than profits.

H2: pressure to address a problem better than absence of pressure

In all four cases, the solution of a local problem was a driver to the initiative. However, pressure to address the problem varied. In the areas with nature reserve context, the need to find a solution to long-term conflicts influenced motivation to collaboration. Moreover, such areas often have increased opportunities to access funding (EI). While in GWP a solution is yet to achieve, cooperation succeeded in KBR. An explanation to this difference may be acceptance of the primary goal 'flood protection' among farmers in KBR, while in GWP the conflict is pointed towards 'farming vs. nature'. This indicates that pressure alone is not a driver to collaboration. BRENDLE (2000) highlights the importance of **pressure and willingness** to address a problem for successful conservation management. Willingness is triggered by socioeconomic incentives which indicates that H1 and H2 are interlinked: *"Mostly [the farmers] come to us to ask, how they can have a role to play in these nature goals, which way it can be included into farming, which way it can be economically profitable. They want some advice on this, not to change the goals but to see how they can realise it, how they can be part of it*" (BE01).

The case study overview showed that drivers of bottom-up initiatives were the urgency to solve a local problem and private benefits. By contrast, in top-down initiatives stakeholders actively create win-win solutions. H2 links to the following determinants of effectiveness and efficiency listed in Figure 8: While a positive influence of a certain pressure on motivation (*perception* (c) and *benefits (g)*) is evident for all cases analysed, a negative influence on *complexity* (d) occurs in GWP and KBR. This leads to higher information and negotiation costs for win-win solutions (NL05, BE03). However, like H1, H2 could be accepted altogether. Despite of win-win incentives in all cases, there is a dependence on the **perceived urgency** to a problem (BRENDLE 2000). As TrC shows, adaptation to climate change seem an abstract problem to most farmers preventing from a higher uptake to date (BE02). Therefore, PRAGER et al. (2012) suggest a phase of awareness raising activities if the problem perception is lacking or marginal.

H3: flexible approaches better than prescriptive ones

Concerning **application** of measures the cases barely enhanced flexibility compared to conventional AEP. Embeddedness in regulatory framework is important (PRAGER 2015a, BRENDLE 2000) but often led to restrictions interviewees referred to, like placing dams in category four in TrC. A lack of flexibility negatively influenced the determinants *perception of the scheme*, *willingness to undertake measures* (c) and *costs of applying measures* (f), like in KBR where the contract partly neglects local knowledge on the coverage of soils with reed. Also, Dutch interviewees stated that demand for transparency of the system resulted in a complex control mechanism implying high TCs for ANVs and individual farmers (NL02). "*There are also a lot of farmers who do protect birds, but they say "I do it in my responsibility. I don't want the money, I don't want the compensation, I do it my own way so I'm flexible*" (NL03). Determinants related to motivation could be enhanced by **payments on the output** as in the cases of Scotland and France (cf. 4.1). This is consistent with theory on PES favouring such payments since those who are paid would choose appropriate and efficient measures (MATZDORF et al. 2014). Moreover, farmers are motivated by leaving responsibility to them, compared to prescribed measures of input-based schemes (KLIMEK et al. 2008). However, the risk of ES production is shifted from state to the farmers which prevents from considerable changes in management practices (FREESE et al. 2011). Other problems are associated to indicator development and premium calculation (SAINTE MARIE 2013, MEYER et al. 2015).

Concerning **contract length**, the cases showed increased flexibility. For TrC, it can be assumed that ABC Eco² will develop follow up projects like in KBR: "*There are a lot of critics on the contracts of AEP. It is only for five years and nature organisations say, "it is not sustainable, we do need 30 years or longer". Also, these projects are only for 2, maximum 3 years maybe, but these groups don't have an end date. The purpose is that they stay as long as possible and that we still assist them after the project*" (BE01). This engagement of ABC Eco² leads to learning effects and long-term relationships through *frequency* (determinant i, Figure 8) in similar actions and a reduction in *uncertainty* (j) concerning effectiveness of measures and behaviour of other actors. Similar effects can be observed for the Dutch cases (NL02, NL04). Here, the incorporation of cAEP into governmental programmes secures the **financial basis for continuity** of initiatives and networks (PRAGER 2015b, BODIN 2017). By contrast, due to a lacking group option for AEP in Belgium, funding for coordinating the groups is a bottleneck and mainly acquired through projects implying additional workload. However, cases from the overview

showed that funding can often be successful acquired through networking within the region (e.g. Pontbren, Frisia). Summarizing, H3 could be accepted because the importance of flexibility has been shown even in absence of more flexibility in applying measures. Here, determinants related to motivation were negatively influenced which would probably reverse to a positive influence if flexibility is provided (cf. Appendix 4).

H4: participatory approach better than no participation

All cases involved farmers, civil and public stakeholders in the design process. This had a positive influence on the following determinants of effectiveness and efficiency from Figure 8: *relationship between actors* (b), *information diffusion* (d) and thus decreased *uncertainty* (j). However, the higher *number and heterogeneity of actors involved* (a) the more effort was required in the *contract design process* (e). Thus, both **public and private TCs** are high which is often criticized as a negative factor for overall efficiency of cAEP (WESTERINK et al. 2017b). Especially in the areas with nature reserves, a broader network of participating actors led to a longer decision process. However, interviewees accept this long process and highlight improving **relationships, acceptance and legitimacy** over an efficient process (NL04, NL05). Hence, there is an importance of both the process and outcome (PRAGER et al. 2012, BRENDLE 2000). *"Because there you will get conflicts (...) [when] you have to buy farmers out (...). They have to leave their land which was to their family a hundred of years. And there will be a conflict. So, we tried it the Dutch way: to talk and talk and talk and hopefully they get cooperative. And it is possible, I think. Because this system shows more or less that it is possible to collaborate with farmers for managing the nature they have on their property"* (NL02). WESTERINK et al. (2017b) suggest that an increase in TCs should be accepted, especially when this can be justified by improvements in effectiveness. Considering this restriction on TCs, H4 could be confirmed for all cases analysed.

However, merely establishing a collaborative network is no guarantee to effectively addressing institutional fit (BODIN 2017). COGLIANESE (2010) highlights **challenges** of collaborative decision processes, such as least-denominator solutions, commitment of public actors on stakeholder processes which outcomes may not be representative or socially optimal and the emergence of new conflicts. For cAEP, several authors emphasize that coordinated approaches may be sufficient and easier to organise in areas where objectives are less complex and contested (BOULTON et al. 2013, PRAGER 2015a, WESTERINK et al. 2017b). Anyway, participatory approaches can only supplement, not

replace governmental decision-making because the state is needed in providing resources and legitimacy (MILLS et al. 2011, BRENDLE 2000, WESTERINK et al. 2017b). This could be a support in **funding additional costs of collaboration**, especially to compensate for unequal power and resource conditions of professional (e.g. agency staff) and volunteers (e.g. farmers) (PRAGER 2015a, ANSELL and GASH 2007). For example, during the process in GWP, public actors and water boards get paid for negotiations while it is extra work for the farmer representatives. Thus, the province decided to provide for a compensation.

H5: cooperation in implementation and monitoring better than no cooperation

Concerning **implementation**, cooperation was less relevant except from KBR. In this case, constant reconcilement of actions led to improved *relationship between actors* (determinant b in Figure 8). By contrast, in TrC, building and management of the dams is rather individual work. A reduction in *costs of measures* (determinant f) was achieved in LBs and KBR through sharing of machinery. However, complex arrangements for payments were necessary in Flanders to compensate for an official group option leading to higher costs and remaining *uncertainty* (j) about penalties for insufficient management. ABC Eco² tries to reduce this risk by small group size and clear contracts (BE01). WESTERINK et al. (2017b) indicate a trade-off for farmer groups in growing sufficiently large to develop organisational capacity and professionalism and being small enough to maintain connectedness. Therefore, OSTROM (1990) suggests **nested structures** that balance autonomy and coordination. In Flanders, ABC Eco² represents a nested structure of smaller groups and in the Netherlands, the ANVs are usually merger of agri-environmental cooperatives.

Concerning **monitoring**, cooperation between farmers, volunteers and public agencies is required in the Dutch system. The case of LBs proved an increase in *environmental awareness and willingness to undertake measures* (determinant c): "*And we see a rise in awareness because (…) [the farmers] can see the different results in their area*." (NL01). This is in line with literature suggesting an engagement of farmers in monitoring since **motivation** is fostered by demonstrable benefits (EMERY and FRANKS 2012, PRAGER 2015a). Success as a driver for motivation is also emphasized by BRENDLE (2000). Moreover, MILLS et al. (2011) state that in the Pontbren group in Wales, self-monitoring proved to be effective because reputation effects ensured compliance and accuracy. However, all interviewees from the Netherlands stated that TCs for monitoring purposes are high, especially for the ANVs who are required to deliver constant reports in a

complex digital system next to on-field monitoring. Thus, there is also evidence for negative influences on the determinants *complexity* (d), *amount of paperwork* (h) and *perception of the scheme* or even *willingness to undertake measures* (c) in cases of farmers who undertake environmental measures without enrolling into AEP (NL03). Moreover, compensation for administration work seem insufficient to cover costs of monitoring (NL02, NL03). Thereby, not real costs are crucial but the farmers perception of costs (FALCONER 2000, METTEPENNINGEN et al. 2009). **Funding** for monitoring and data management, independent from project funding, is considered important (PRAGER 2015b, WESTERINK et al. 2017b). All in all, H5 could be accepted for all cases, despite of some challenges to efficiency because they are compensated by increased effectiveness.

H6: broad involvement of advice/support better than single consultation

In the Dutch system, the ANVs organise and contract external advisory and supportive agents. However, due to limited budgets they often organise demonstration events and meetings by themselves, merely employing someone for application tasks to reduce the *amount of paperwork* (determinant h in Figure 8) for farmers. By contrast, the Flemish groups are **accompanied by coordinators** of ABC Eco² who undertake administration, represent their interests, and organise meetings and information events with ecological or agronomic experts. Their work is appreciated by both farmers and partner organisations because they facilitate *contract design* (e), *information diffusion* (d) and communication and therefore contribute to a reduction of *uncertainty* (j). The acceptance of H6 is thus mainly based on observations from the Flemish cases (cf. Appendix 4). The coordinators are successful because they are **trusted** by all parties. ABC Eco² usually selects coordinators for groups who are from the respective region. MILLS et al. (2011) note that intermediaries require skills but most importantly a personality to enter in dialogue with stakeholders, especially with farmers, which is easier for local people. *"(…) it is also that they have to be technical experts, but they have to be also social experts, a facilitator between these different opinions. They have to understand the farmers, but they have also to understand the nature organisations. That's the challenge. In our organisation, (…) we are more generalists*" (BE01).

Another important aspect is a positive influence on the determinant *environmental awareness* (c) of farmers in the Flemish groups. Thus, ABC Eco² facilitated a **learning process** in which farmers revisited goals and assumptions. According to PAHL-WOSTL (2009), this can be classified as double-loop learning, by contrast to single-loop learning

which is improving established routines. Intermediaries within networks may even play an important role in triple-loop learning, the level where underlying values and beliefs are reconsidered leading to a change in paradigm and transformation of systems (PAHL-WOSTL 2009). This process can be achieved when intermediaries assist in developing skills for working together rather than prescribing changes (MILLS et al. 2011). However, financial resources depending on projects restrict the amount of time for coordinators to support the Flemish groups. Governmental provision of an adequate **funding for intermediaries** is crucial and recently addressed, e.g., by the Countryside Stewardship Facilitation Fund in England (EI, PRAGER 2015b). Moreover, there is also a responsibility of intermediaries to pass on their knowledge and contacts to successors. The more networks depend on single actors the more important it is to secure continuity (EI).

H7: Existing local network (incl. local key player) better than absence of network

Considering existing structures, the initiative in Dommel valley based on a trustful relation between farmers and the local water board. Such positive *relationships* (determinant b, Figure 8) to water boards can also be detected for GWP and LBs, which influenced the *contract design process* (e). In LBs, public authorities, water board and farmers even had experience in cooperating through pilot projects. Moreover, in both examples **former collectives merged in the ANVs** which reduced *uncertainty* (j) in the new system despite of effort to harmonize different ways of working. *Complexity* (d) and coordination costs further increased in LBs because the ANV is jurisdictionally divided between two provinces. RILEY et al. (2018) emphasize that environmental cooperation among farmers in the Netherlands emerged from a **unique historical development** and assuming successful farmer-farmer relations in different contexts is problematic. Positive relationships between farmers do not necessarily lead to willingness to cooperate. There is often a habitus among farmers favouring intermittent rather than continuous support and a lack of communication around conservation activities (RILEY et al. 2018).

PRAGER (2015a) suggests that **intermediaries** can facilitate a flow of information among farmers and within the whole network of stakeholders. In Flanders, the coordinators of ABC Eco² undertake this role and improve *relationships* (b). However, they also build on existing structures of the **local farmer unions** to introduce ideas and projects to farmers. "*At these local levels they also have a coordinator who is working for the farmer union. So, if we had the trust of this coordinator he could convince with us the local representatives of the farmer union. And they have influence on other farmers, so they*

are more likely to agree with us" (BE01). Although ABC Eco² increasingly profits from positive reputation and experience with a growing number of groups, key players among the farmers have an integral role. MILLS et al. (2011) state that in absence of **leadership** collective action may not occur regardless of farmers' willingness to cooperate. In KBR, the chairman of the group initially encouraged the others reducing *uncertainty* (j). Likewise, in LBs, the leadership of one farmer who is engaged in connecting, educating and convincing his colleges is precious. In addition to his board membership in the ANV, he is board member of a local feeding cooperation and thus well-known and trusted among farmers and other stakeholders who value his effort: "*it is really difficult to trigger awareness. But when a farmer tells a farmer "I am doing it like this" about the measures he takes, with enthusiasm, a lot of farmers listen to what he has to say*" (NL01). Summarizing, H7 could be fully accepted for three cases analysed and partially accepted for LBs due to initial problems when organisations merged (cf. Appendix 4).

5.2 The Contribution to Institutional Fit

Based on the above presented discussion on design characteristics, a positive contribution of cAEP to institutional fit can be confirmed. Since each hypothesis exhibits a positive influence on determinants of effectiveness and efficiency, none of the seven hypotheses was rejected. However, one can also observe a negative influence on determinants increasing the effort required for coordination. While a generally **positive influence on effectiveness** through spatial targeting, use of local knowledge and participation could be observed, the influence on **efficiency** depending on public and private TCs was more **indifferent**. For example, participation of private and civil actors in design caused a higher effort required for negotiation but led to improved information diffusion at the same time. This result is consistent with literature emphasizing higher **costs of coordination** as a considerable challenge of participative and cooperative multi-actor approaches (e.g. COGLIANESE 2010, BODIN 2017). Several authors therefore highlight that more coordinative approaches can be sufficient to achieve ecological improvements, depending on the individual context (BOULTON et al. 2013, PRAGER 2015a). Nevertheless, WESTERINK et al. (2017b, p.184) indicate: "*According to economic theory, any increase in transaction costs should ideally be compensated for by additional gains. Actors apparently have good reasons for engaging in collaboration, in spite of the costs*". This is explained by PRAGER (2015a, p.64) stating that "*if objectives are more complex,*

contested and interlinked with development in the wider rural landscape, a collaborative approach is needed to negotiate the interests of a multiplicity of actors" although requiring more effort. These considerations undermine the importance of participatory design and a holistic approach plus a certain level of pressure to address a local problem as characteristics of cAEP. To summarize, none of the hypotheses can be rejected but a detailed analysis of outcomes is required to further approach assess effectiveness and efficiency. Also, the contribution to spatial, temporal and functional fit could further be investigated, e.g. by linking single characteristics to network analysis (cf. BODIN 2017).

Although the case studies indicate improved institutional fit compared to conventional AEP, e.g. through spatial coordination, continuity, and accounting for social and ecological interdependencies, **persisting misfit issues** can be detected. In the Netherlands, the transformation to a new AEP caused difficulties, like in LBs where small collectives former operated in one of the provinces are now merged in one ANV operating in two provinces. This kind of misfit is what GUERRERO et al. (2015) describe as a jurisdictional misfit which is another dimension of spatial misfit. Moreover, the complex reporting system causes a high level of effort for farmers which is sometimes a barrier to enrol. This is what WESTERINK et al. (2015) qualify as a lack of fit between the extent of governmental involvement (top-down) and the trend towards increased bottom-up governance. As shown in the overview, most cases of cAEP, including the in-depth case studies, are a mixture of bottom-up and top-down elements. WESTERINK et al. (2015) describe two forms of functional misfit in which a lack of institutional compatibility in social systems prevent from adequate governance of ecological systems: first, a situation when space for bottom-up initiatives is restricted by governmental policies and second, a situation when groups of individuals are incapable of sustaining bottom-up initiatives to the extent envisioned by the government. The Dutch case studies can be ascribed to the first situation of restrictive policies. Although the new AEP aims to reduce bureaucracy and transaction costs, this is contradicted by extensive reporting requirements[13]. By contrast, the Flemish cAEP can be ascribed to the second situation. Due to the lack of an official group option with funding for coordination, the groups are restricted in enlarging their activities.

[13] Interestingly, WESTERINK et al. (2015) already ascribed the Dutch pilots for the new system to this scenario, for the same reasons (cf. also RUNHAAR et al. (2016)).

For a situation of compatibility, WESTERINK et al. (2015) propose that **governments should facilitate suitable conditions** by providing funding, knowledge and legislative framework. In the Netherlands, a comprehensive implementation of the front-door-back-door approach, also in terms of reporting, could be an improvement. Collaborative on-field monitoring could be extended if resources are saved through simplification of the digital reporting system. However, such a decision depends on several governmental levels, ranging from provincial to EU, with different conditions to overview the collectives' activities (asymmetric information): "*We are really willing to search for an easy way to provide the money because now it is not a nice job for [the farmers] (…) But there are also some rules from Europe we can't…* (…) *because it is 50 percent from Europe we have to be transparent and clear about how we spend the money"* (NL02). In Belgium, an improvement would be the implementation of a group option for AEP, with funding for coordination tasks to secure a continuous support for the nested structure of farmer groups compared to project funding: "*We are hoping that with the new policy of the CAP there will also be money for the advisory behind these groups, the coordination costs, transaction costs, because otherwise it is not sustainable"* (BE01).

Hence, for cAEP, governments play an important role in establishing PES, setting up top-down programmes and encouraging bottom-up initiatives simultaneously (VATN 2016, WESTERINK et al. 2017b). Ideally, they provide funding to guidance by intermediaries and to cover additional costs of collaboration (PRAGER 2015a, 2015b, GUERRERO et al. 2015). In addition, PRAGER (2015a) particularly suggests a funding and training for farmers to undertake monitoring activities. A **collaborative approach to monitoring** may reduce overall costs of data gathering and will be facilitated if farmers understand and agree with indicators and methods of measuring (PRAGER et al. 2012). It can stimulate motivation for environmental measures (EMERY and FRANKS 2012) and contribute to double- or even triple-loop learning (PAHL-WOSTL 2009). Extending monitoring activities beyond experts to farmers and community actors can help in adjusting the programme in a dynamic and complex SES (PRAGER et al. 2012, WESTERINK et al. 2017b). According to CUMMING et al. (2006), long-term institutional fit depend on social learning and flexible institutions that can adjust and reorganize in response to changes in ecosystems. This is in line with proposals of BERKES et al. (2008) to build for **adaptive capacity** in SES, which among others include combining different types of knowledge for learning and creating opportunity for self-organisation of social-ecological sustainability through matching scales of ecosystems and governance. "*You always have to look at the different scales*

and try to see the connections between them." (NL04). Also, the adaptive capacity of cAEP is recognized: "*There were a lot of initial problems. But I think the best way forward, (…), is to stick with this system. Do not change this system even it is not perfect. Go ahead and it will improve. Give more trust to the collectives"* (NL03). Likewise, WESTERINK et al. (2017b) highlight that adaptive collaborative governance, incorporating learning, monitoring and evaluation, is key to effective agri-environmental management.

5.3 Methodological Considerations

In this study, the **two-step approach** proved valuable to gain broad information on different arrangements for cAEP from literature and then deeper understanding of key structures for their functionality based on four empirical case studies that provided for detailed information needed for this analysis. It was possible to show similar patterns and key characteristics of cAEP while accounting for the fact that initiatives generally differ, depending on the regional context. However, the deeper analysis in respect of the research question was mainly based on empirical data. Thus, some limitations in **quality of data** originating from the interviews conducted are to be considered.

The selection of an in-depth mode is regarded as appropriate because it left flexibility to interviewees, so that topics initially not accounted for emerged in conversations and enabled deeper understanding. Moreover, the creation of a **trustful relation** between interviewer and respondents contributed to reliability of answers. However, the creation of a good atmosphere highlighted by LEGARD et al. (2003) was challenged in some interviews with farmers due to a language barrier. Although this was partly compensated by meeting them on their farms accompanied by trusted people who functioned as translators, these interviews tended to be shorter and restricted in active impulses of the farmers. Further regarding validity of answers, a problem with in-depth interviews in combination with a limited number of interviewees is the dependence on **perceptions**, beliefs and experiences (BOYCE and NEALE 2006). Moreover, the likelihood of a strategic bias is enhanced (ibid.). Indeed, most interviewees aimed to show advantages of collaborative approaches which was compensated by the interviewer in directing the conversation towards challenges. The author notes that trustful situations in the interviews helped that all interviewees talked about challenging issues in detail. A balance in **addressing opportunities and challenges** in the interviews also compensated for the problem of developing meaning through interaction of interviewer and respondent

(LEGARD et al. 2003). Moreover, previous collection of data from literature improved the overview of possible key characteristics needed to refine an adequate questionnaire and address important issues during the interviews. Summarizing, as no major inconsistencies in responses of different stakeholders were identified, the collection of empirical data and their quality can be approved.

As BHATTACHERJEE (2012) claims, the **quality of inferences** also depend on the approach of analysis and integrative powers of the researcher. An experienced researcher may easier depict concepts and patterns detached from the context of data and from subjective perceptions. BHATTACHERJEE (2012) suggests **operationalization** to improve the subjective character of interpretations. Indeed, difficulties to assess social constructs like trust or social capital are acknowledged for this study. However, due to the focus on design characteristics, formulation of precise indicators for determinants like 'relationship between actors' or 'awareness of environment' was renounced. Another limitation refers to the generalizability of findings. Next to problems in comparability of case studies in different contexts, another challenge is the **dynamic** nature of SES. An analysis in a point of time limits the view of processes in a longitudinal manner (BHATTACHERJEE 2012). As characteristics of collaborative initiatives respond to feedbacks they may be different in another point of time. Therefore, WESTERINK et al. (2017b) observed initiatives at two points in time. The study at hand only partly accounts for path dependency, e.g. by regarding the existing social network and developments in national legislation. Despite of these limitations, the quality of data analysis is regarded as sufficient and was further improved through impulses from the expert interview.

Finally, another limitation of the methodological approach arises from the **choice of research focus and framework**. The study integrates a variety of concepts providing for an overview and ideas to further investigation while selectively remaining vague. On the one hand a detailed analysis of data regarding institutional fit is lacking and on the other hand, findings on effectiveness and efficiency remain vague. One reason is the difficulty to obtain reliable data on ecological outcomes at this early stage of collaborative initiatives. At this moment, the level of uptake of measures is a proxy for effectiveness (EI). Regarding efficiency, a quantification of TCs would be required to ponder opposite effects observed in case studies, but transferability of results from single cases are questionable (EI). In general, it is questionable whether an economic approach is suitable to account for the multiplicity of benefits from collaboration, e.g. improving relationships (MURADIAN and RIVAL 2012). Nevertheless, public expenditures are based on cost-

benefit analyses for reasons of transparency and justification. Assuming the importance of governmental funding for cAEP, economic calculations are required to determine an adequate level of payments. All in all, using a framework that **combines economic and integrative concepts** was reasonable since the latter are also inevitable by addressing simplification of complex and dynamic processes in SES through classical economic approaches (MURADIAN and RIVAL 2012). The framework helped to provide an overview and to understand functionality of cAEP without bearing a risk of overemphasizing single aspects, e.g. by focussing on the role of trust. Design characteristics may to be completed, refined or reorganised and transferability is limited because there is no "one-size-fits-all" (WESTERINK et al. 2017b). However, they are useful to depict similarities as key characteristics and to discuss main obstacles.

6 Conclusion and Outlook

This study analysed design characteristics of collaborative approaches to agri-environmental programmes in Europe by a combination of a literature review and own empirical findings. Thereby, findings were complementary and provided an answer to the research question on how certain characteristics of cAEP can improve institutional fit and thus effectiveness and efficiency. Summarizing, the results indicate that cAEP profit from co-design of private and community actors and a holistic approach balancing several objectives, which set a basis for acceptance and responsibility. Flexibility, cooperation in implementation and monitoring, and a broad involvement of professional advice or support stimulate motivation and learning. Moreover, collaboratives profit from a certain pressure to address a problem and an existing local network to build upon. Ideally, the presence of a leader fosters collaboration. These findings complete existing studies by an overview of **key characteristics** for cAEP while accounting for the fact that arrangements differ, depending on individual context-specificity and dynamics of the respective SES.

By linking characteristics to the concept of institutional fit it became clear how cAEP **mitigate misfit** of conventional AEP. These lack in successful provision of ES in European landscapes because they are not well aligned to the scales of respective ecosystems. Moreover, they miss a positive perception among farmers while societies' demand and ecological requirement to effective, cross-sectoral nature conservation increases. Accordingly, **encouraging collaboration** to improve institutional fit of AEP is promising but requires knowledge on functionality of cAEP. The detailed analysis of cases in the Netherlands and Flanders revealed the **challenge of persisting misfit** issues regarding the mix of top-down and bottom-up elements. The role of governments in providing funding and legislative framework is to be balanced to encourage bottom-up initiatives without overregulating them. The overview of case studies from literature confirmed different arrangements for cAEP along a spectrum of coordinated, rather top-down approaches and collaborative bottom-up initiatives. Both approaches can be successful in providing ES, but the more complex and contested objectives are, increasing collaboration is necessary regardless of higher effort. In particular, elements of collaborative monitoring feeding results back to programme design are interesting, also for complementing more coordinative approaches, because they may contribute to adaptive capacity and long-term solutions for social-ecological sustainability.

The role of collaborative monitoring in influencing motivation of actors and learning could also gain further attention in **research**. Moreover, specific characteristics linked to actor constellations of collaborative initiatives in different contexts could be investigated in detail by network analysis to avoid persisting misfits and thus ineffective collaboration. Further attention could also be drawn to the dynamic structure of cAEP. Finally, there is a need for long-term evaluation of existing initiatives to obtain reliable data on outcomes. This would enable a better comparison to conventional AEP, as the **basis for policy** decisions towards more participatory forms at landscape scale following the EU principles of subsidiarity and proportionality of public intervention. Against this background, the study concludes with a statement by VATN (2016, p.373): "*To reiterate the obvious: no governance structure is ideal. Contextual analyses are always necessary. One issue seems, however, not context dependent. This is the importance of the policy process and of citizens' engagement*".

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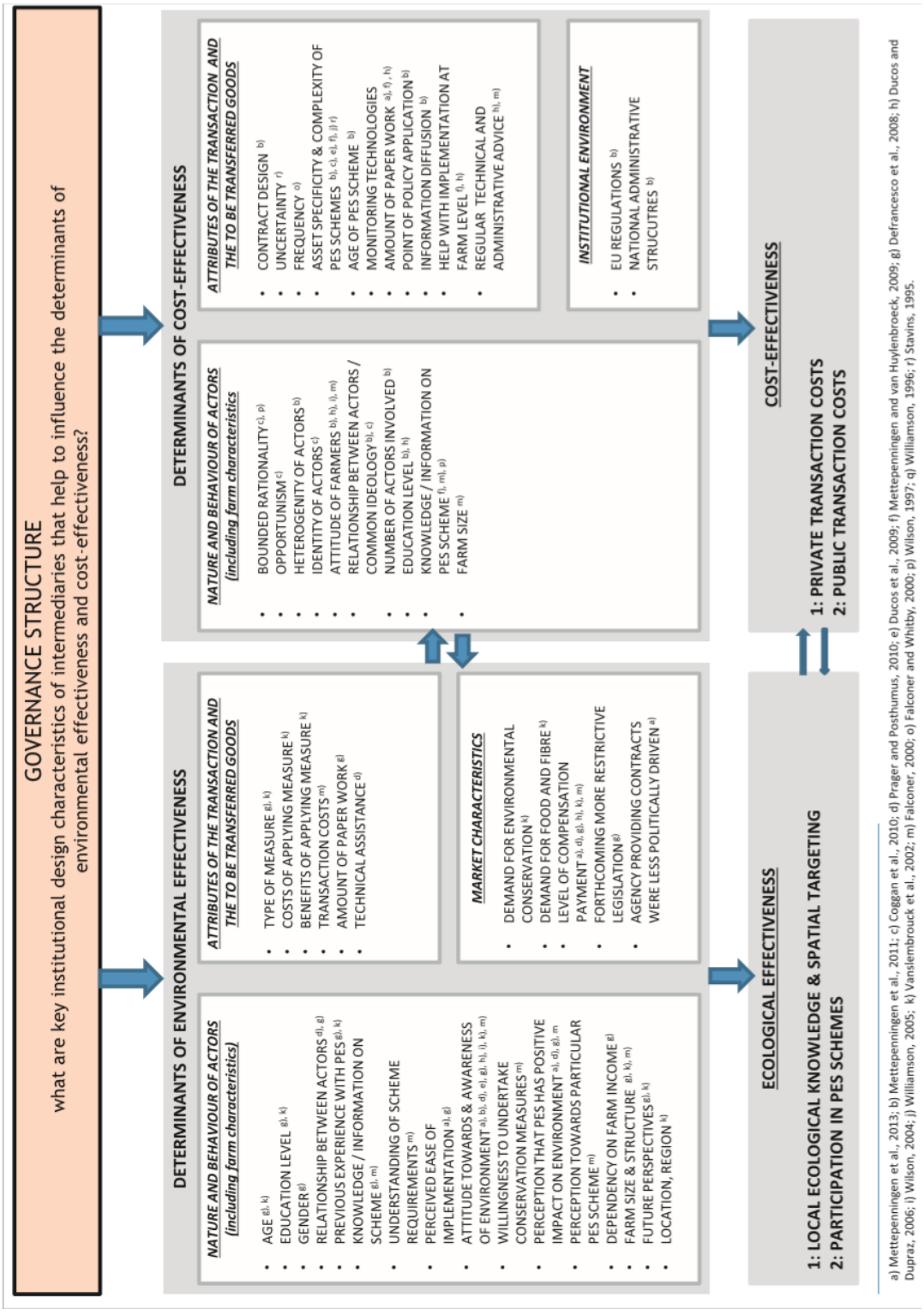
Appendix

Appendix 1: Framework to Assess the Potential of Intermediaries to Improve PES Implementation by SCHOMERS et al. (2015).



Appendix 2: Interview Guideline and Relation of Expected Information to Hypotheses Derived Beforehand (own elaboration).

Note: questions 10-14 target information for all hypotheses.

<table>
<tr><th colspan="3">Overall RQ: Which design characteristics of cAEP improve institutional fit and thus increase effectiveness and efficiency?</th></tr>
<tr><td>RQ1: Does a holistic approach support the fit of AEP?</td><td>H1: holistic local approach (several ES) better than single goals
*(e.g. questions 1, 2, 5, 6, **7**)*</td><td rowspan="7">**Initiation**
1) Who initiated the programme? (Why? When? How? Which area?)

Actors
2) Who was involved in designing the contract? (Who not? Who did what?) Who was most important? Which impact did the participation of specific actors have?
3) Who was involved in implementation and monitoring? (Who did what? Which measures were applied?) Which impact did the participation of specific actors have?
4) How do you assess the role of advice and support? (What did they do?) Which impact did this help have?
5) Has there been an existing local network the project built upon? Which impact did the relationships have on the project?
6) Who provided funding for the program? (Public and/or private funders?) Funding periods? Amount of funding? (Is it sufficient?)

Contract
7) Have there been different goals or conflicting goals which have been resolved? (How resolved?) Which impact did the integration/non-integration of specific goals have?
8) In how far were farmers flexible, in application of measures and contract length? Which impact did this flexibility/inflexibility have?
9) How was the payment organised? (Based on measures or environmental output? Are you satisfied with it?)

Outcomes
10) Would you consider the programme as environmentally effective?
11) Would you consider the programme as efficient?
12) How was the acceptance of the project by farmers? (participation numbers?)
13) Has the relationship between actors changed during the runtime of the programme?

Challenges
14) Are there remaining challenges that still need to be addressed? What should be improved in your opinion?</td></tr>
<tr><td>RQ2: Does pressure to address a problem constitute a precondition for cAEP mitigating institutional misfit?</td><td>H2: pressure to address a problem better than absence of pressure
*(**1**, 2, 6, 7)*</td></tr>
<tr><td>RQ3: Does flexibility (in applied measures, contract lengths) mitigate misfit in AEP?</td><td>H3: flexible approaches better than prescriptive ones
*(6, **8**, 9)*</td></tr>
<tr><td>RQ4: Does participation of farmers and other local stakeholders in the design process improve the fit of AEP?</td><td>H4: participatory approach better than no participation
*(**2**, 7, 8, 9)*</td></tr>
<tr><td>RQ5: Does cooperation of farmers and other stakeholders in implementation and monitoring improve the fit of AEP?</td><td>H5: cooperation in implementation and monitoring better than no cooperation
*(**3**, 8, 9)*</td></tr>
<tr><td>RQ6: Does a broad involvement of professional advise/support increase the fit of AEP?</td><td>H6: broad involvement of professional advise/support better than single consultation
*(1, 2, 3, **4**, 7)*</td></tr>
<tr><td>RQ7: Does an existing local network constitute a precondition for cAEP mitigating institutional misfit?</td><td>H7: Existing local network (incl. local key player) better than absent network
*(1, 2, 3, **5**, 7)*</td></tr>
</table>

Appendix 3: List of References for Case Studies from Literature.

Balmacara Estate – Scotland

BOULTON, A., LOCKETT, R. and SEYMOUR, T. (2013): A Review and Evaluation of Collaborative Landscape-scale Management Initiatives. Scottish Natural Heritage Commissioned Report No. 598.

NATIONAL TRUST FOR SCOTLAND (2012): Balmacara Estate Traditional Croft Management Scheme 2012. http://www.slef.org.uk/userfiles/file/nts/tcms-2012-version.pdf (date: 18.03.2018).

Söne Mad – Sweden

OECD (2013): Providing Agri-environmental Public Goods through Collective Action. OECD Publishing.

WÄSTFELT, A., SALTZMAN, K., GRÄSLUND BERG, E. and DAHLBERG, A. (2012): Landscape Care Paradoxes. Swedish Landscape Care Arrangements in a European Context. Geoforum 43 (6), 1171–1181.

Pontbren Catchment – Wales

MILLS, J., GIBBON, D., INGRAM, J., REED, M., SHORT, C. and DWYER, J. (2011): Organising Collective Action for Effective Environmental Management and Social Learning in Wales. The Journal of Agricultural Education and Extension 17 (1), 69–83.

WYNNE-JONES, S. (2017): Understanding Farmer Co-operation. Exploring Practices of Social Relatedness and Emergent Affects. Journal of Rural Studies 53, 259–268.

Bauges Massif, Northern Alps – France

SAINTE MARIE, C. de (2013): Rethinking Agri-environmental Schemes. A Result-oriented Approach to the Management of Species-rich Grasslands in France. Journal of Environmental Planning and Management 57 (5), 704–719.

Burren, County Clare – Ireland

BURREN LIFE PROGRAMME (2016): Burren Life Programme. http://burrenprogramme.com/portfolio-items/burren-programme-2016-executive-summary/ (date: 18.03.2018).

LENIHAN, M.H. and BRASIER, K.J. (2009): Scaling Down the European Model of Agriculture. The Case of the Rural Environmental Protection Scheme in Ireland. Agriculture and Human Values 26 (4), 365–378.

Aso Valley, Marche Region – Italy

TODERI, M., FRANCIONI, M., SEDDAIU, G., ROGGERO, P.P., TROZZO, L. and D'OTTAVIO, P. (2017): Bottom-up Design Process of Agri-environmental Measures at a Landscape Scale. Evidence from Case Studies on Biodiversity Conservation and Water Protection. Land Use Policy 68, 295–305.

Dommel Valley, Limburg – Belgium

KROM, M.P. de (2017): Farmer Participation in Agri-environmental Schemes. Regionalisation and the Role of Bridging Social Capital. Land Use Policy 60, 352–361.

OECD (2013): Providing Agri-environmental Public Goods through Collective Action. OECD Publishing.

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Northern Frisian Woodlands Association – Netherlands

TERMEER, C.J., STUIVER, M., GERRITSEN, A. and HUNTJENS, P. (2013): Integrating Self-Governance in Heavily Regulated Policy Fields. Insights from a Dutch Farmers' Cooperative. Journal of Environmental Policy & Planning 15 (2), 285–302.

Appendix 4: Influences of Hypotheses on Determinants of Effectiveness and Efficiency (own elaboration).

	H1: holistic approach (several ES)				H2: pressure to address a problem				H3: flexibility in application and contract length				H4: participatory approach				H5: cooperation in implementation and monitoring				H6: broad involvement of advice/support				H7: existing local network			
	GWP	LBs	KBR	TrC	GWP	LBs	KBR	TrC	GWP	LBs	KBR	TrC	GWP	LBs	KBR	TrC	GWP	LBs	KBR	TrC	GWP	LBs	KBR	TrC	GWP	LBs	KBR	TrC
a)													+/-	+/-	+/-	+/-												
b)					+	+	+	+					+	+	+	+		+	+						+	+	+	+
c)		+	+			+	+	+	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-		+/-	+				+	+				
d)	+/-		+/-		+/-		+/-						+	+	+	+	+/-	+/-	+				+	+		-**		
e)	+/-		+/-		+/-		+/-																+	+	+	+	+	+
f)									-	-	-						+/-	+/-	+									
g)	+	+	+	+	+	+	+	+																				
h)																	-	-			+	+	+	+				
i)									+	+	+	+									+	+	+	+				
j)	+	+	+/-*	+					+	+	+	+	+	+	+	+		+	+/-	+			+	+	+	+	+	+
	(√)	√	(√)	√	(√)	√	(√)	√	√	√	√	√	(√)	(√)	(√)	(√)	(√)	(√)	(√)	(√)	(√)	(√)	√	√	√	(√)	√	√

Determinants of effectiveness and efficiency: *a) number and heterogeneity of actors involved, b) relationship between actors and opportunism, c) awareness of environment, willingness to undertake measures and perception on the scheme, d) asset specificity, complexity and information diffusion, e) contract design process, f) costs of applying measure, g) benefits of applying measure, h) amount of paperwork, i) frequency, j) uncertainty*

Positive influence: + Negative influence: - Empty fields: no information or no significant influence

Implications on Hypotheses: accepted: √ partially accepted: (√)

* Ecological trade-offs also negatively affected uncertainty

** Former groups merged in one ANV that cooperates with two provinces

Selbstständigkeitserklärung

Hiermit erkläre ich, dass die vorliegende Arbeit nicht für andere Prüfungen eingereicht worden ist und selbstständig geschrieben wurde. Sämtliche Quellen einschließlich Internetquellen, die unverändert oder abgewandelt wiedergegeben werden, insbesondere Quellen für Texte, Grafiken, Tabellen und Bilder, sind als solche kenntlich gemacht und mir ist bekannt, dass bei Verstößen gegen diese Grundsätze ein Verfahren wegen Täuschungsversuchs bzw. Täuschung eingeleitet wird.

Berlin, 8. Mai 2018

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