



Co-Design of innovative contract models for agri-environment and climate measures and the valorisation of environmental public goods

## Key concepts to investigate agri-environmental contracts – Shared Conceptual Framework

Deliverable 1 / 1.1

Main Author/s:	Katrin Prager (UNIABDN), Bettina Matzdorf (ZALF), Céline Dutilly (CIRAD)
Co-Author/s:	Erling Andersen (UCPH), Rena Barghusen (ZALF), Birte Bredemeier (LUH), Lenny van Bussel (WU), Jennifer Dodsworth (UNIABDN), Salomon Espinoza Diaz (UNIFI), Eszter Kelemen (ESSRG Kft), Marina García-Llorente (UAM-IMIDRA), Dieter Mortelmans (EV-INBO), Roberta Moruzzo (UNIFI), Francesco Riccioli (UNIFI), Jens Rommel (SLU), Claudia Sattler (ZALF), Christoph Schulze (ZALF), Francis Turkelboom (EV-INBO)
Reviewed by:	Bettina Matzdorf (ZALF), Erling Andersen (UCPH), Sven Defrijn (ABC-Eco <sup>2</sup> )
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## EXECUTIVE SUMMARY

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The Contracts2.0 project aims to develop novel contract-based approaches to incentivise farmers for the increased provision of environmental public goods alongside private goods. The background to this work is the current imbalance in the provision of private and public goods from agricultural land management. This complex problem can best be addressed by using insights and methods from a range of disciplines. However, for methods and researchers to complement each other and contribute to the project aim, the parts must be brought together as a coherent whole. We developed a conceptual framework which draws on different concepts to explain the issues underlying the delivery of private and public environmental goods from agriculture.

This document sets out the key concepts we use to investigate agri-environmental contracts in Contracts2.0. At the heart is our understanding of what a contract is, and which types of contracts will be studied. In Contracts2.0 we will focus on contracts that enhance the provision of **environmental public goods and ecosystem services** (Concept note 1) through supporting farmers or other land managers to adapt their land use and management. We distinguish three different contract types:

- 1) Payments for Ecosystem Services (PES) contracts including agri-environment climate measures (AECM),
- 2) Land tenure contracts, and
- 3) Contracts associated with the value-chain.

Two further distinctions among all three contract types are that a) they can have a result-based or action-based contract design and b) they can have a collective or bilateral design.

We draw on theories from New Institutional Economics to identify design features of contracts and contract governance. Contracts are inherently linked to costs and payments. We utilise the lens of **payments for ecosystem services** (Concept note 2) and **transaction costs** (Concept note 6) to capture these aspects of contractual arrangements. **Institutional analysis** (Concept note 5) offers a comprehensive framework and methods to analyse the context in which contracts are designed and implemented, taking into account policies and regulations, **land tenure and property rights** (Concept note 3), as well as actors (contract parties) and outcomes. **Collaborative approaches** in the delivery of bilateral and **collective contracts** (Concept note 4) are of particular interest in order to achieve coordinated action and increased environmental benefits at a landscape scale.

We identified complementarity and overlap between different schools of thought, but also the different use of terminology in different fields. There are particular synergies between the payments for ecosystem services strand and the (collaborative) agri-environmental management strand. We also found that transaction costs, policy analysis, land tenure and property rights sit comfortably in an institutional analysis framework. The exchange of ideas and the conceptual understanding of the research challenge will be ongoing, but this conceptual framework represents the reference point that the team can use to refine the analysis and interpretation of results. The conceptual framework is supported by a glossary of terms ([www.project-contracts20.eu/glossary/](http://www.project-contracts20.eu/glossary/)).

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## ABBREVIATIONS

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AECM	Agri-Environment-Climate Measures
CAP	Common Agricultural Policy
CSS	Countryside Stewardship Scheme
ES	Ecosystem Services
ESA	Environmentally Sensitive Areas
EU	European Union
IAD	Institutional Analysis and Development Framework
NIE	New Institutional Economics
PES	Payments for Ecosystem Services
PSA	Pagos Por Servicios Ambientales
PSA-H	Payment for Hydrological Environmental Services
RDP	Rural Development Programme
SES	Social-Ecological Systems
TC	Transaction Costs
TEEB	The Economics of Ecosystems and Biodiversity

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## INTRODUCTION

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The Contracts2.0 project aims to develop novel contract-based approaches to incentivise farmers for the increased provision of environmental public goods alongside private goods. The premises are that innovative contract-based approaches should be environmentally more effective, economically viable for farmers and support the longevity of contractual arrangements.

### Problem statement

The background to this work is the current imbalance in the provision of private and public goods from agricultural land management. In addition to providing private goods such as food, fibre and biomass, agriculture can deliver a variety of environmental public goods, such as biodiversity conservation, water filtering, carbon sequestration and landscapes for recreational use. Often, however, the use of agricultural landscapes prioritises the provision of private goods, resulting in negative environmental impacts on ecosystem services due to soil erosion, nitrate leaching, or habitat and biodiversity loss. Contracts2.0 aims to address these issues by researching ways to improve existing contract-based approaches such as publicly funded agri-environment-climate measures (AECM), privately funded Payments for Ecosystem Services (PES) or collective arrangements between all concerned actors.

Agri-environment schemes consist of different **agri-environment-climate measures (AECM)**. AECM are a funding mechanism that provides financial support to farmers to contribute to the protection or enhancement of biodiversity, soil, water, landscape, air quality, or climate change mitigation or adaptation. This is an important part of the second pillar of the EU's Common Agricultural Policy and implemented via the Rural Development Programmes (RDPs) of individual member states. The 'climate' aspect has been included in the 2014-2020 round of RDPs. Terms differ between countries.

**Payments for ecosystem services (PES)**, also known as payments for environmental services) are payments to farmers, landowners or land managers who have agreed to take certain actions to manage their land to provide an environmental service. A PES scheme is a transparent system for the additional provision of environmental services through conditional payments to voluntary providers.

A key challenge is to reduce trade-offs between the profitability of farming businesses with environmental sustainability objectives. This is especially important as many farmers are currently struggling to maintain the economic viability of their farms, facing serious trade-offs between short-term profitability and sustainable production. In consequence, many farmers consider dropping out of production which consequently ends their service to society as a steward for the provision of environmental public goods. To reduce trade-offs, improved contract-based approaches are urgently needed which provide monetary or other forms of support to farmers through additional public and private incentives to produce a mix of private and public goods that better reflects society's preferences. While some argue that contracts should pay for *additional* provision of ecosystem services, others stress that maintaining and securing the *current* provision of such services is equally

important. A further consideration is specific contracts paying for transition to – and sustained application of – more environmentally friendly (e.g. agro-ecological) farming practices. Experiences gained from the evaluation of AECM and PES schemes show that an adapted contractual design is key to improve the environmental effectiveness, economic profitability and longevity of contracts.

### **Purpose of the conceptual framework**

This complex problem can best be addressed by using insights and methods from a range of disciplines. However, in order for methods and researchers to complement each other and contribute to the project aim, the parts must be brought together as a coherent whole. It needs to be clear how individual concepts, theories, underlying assumptions and discipline-specific terms relate to each other, and what caveats each approach might have. Therefore, we developed this conceptual framework which draws on key concepts used to explain the issues underlying the delivery of private and public environmental goods from agriculture. Initial discussions were held during the proposal development stage, with further exchanges during the project's kick-off meeting in June 2019 and cross-WP meeting in November 2019. It became clear that the project team share a general understanding of the problem and the approaches to take, but bring their own disciplinary expertise and research experience to the project. The concept notes were developed by mixed author teams, and influenced by the knowledge of how existing contracts work in the respective partner countries.

The conceptual framework is supported by a glossary of terms ([www.project-contracts20.eu/glossary/](http://www.project-contracts20.eu/glossary/)), and expands on some of the terms. In addition, the Analytical Framework (Deliverable 1.2) complements the conceptual framework by providing detailed information on the Contracts2.0 approach of using an innovation pathway combining a 'practice path' and a 'research path', the Design Thinking approach, and the suite of research methods and stakeholder engagement methods applied throughout the project. A further link exists to the synthesis framework (D1.3) which supports the synthesis of interdisciplinary results and the outcomes of the contract innovation labs and policy innovation labs. Together, the three frameworks help to implement the diverse practice and research activities systematically and in a coordinated manner. The development of these frameworks is also important for project-internal communication and to build a common understanding of the research. Such a common understanding is central for transdisciplinary projects.

### **Contracts as key research focus of our project**

The Contracts2.0 research project focuses on the question: which innovative contract models enhance the provision of environmental goods and at the same time enable economically viable agriculture? The development of innovative contracts as a specific approach to solving current environmental problems in agriculture is therefore at the core of our research.

#### **What are contracts?**

Contracts are used in both economic and legal contexts, and are subject of economic (contract theory) as well as legal theories and research. The following two definitions show there is a common understanding what the core elements of contracts are:

1. A legal definition: “An agreement with specific terms between two or more persons or entities in which there is a promise to do something in return for a valuable benefit known as consideration. The existence of a contract requires finding the following factual elements: a) an offer; b) an acceptance of that offer which results in a meeting of the minds; c) a promise to perform; d) a valuable consideration (which can be a promise or payment in some form); e) a time or event when performance must be made (meet commitments); f) terms and conditions for performance, including fulfilling promises; and g) performance.”<sup>1</sup>
2. A business definition: “A voluntary, deliberate, and legally binding agreement between two or more competent parties. Contracts are usually written but may be spoken or implied, and generally have to do with employment, sale or lease, or tenancy. A contractual relationship is evidenced by (1) an offer, (2) acceptance of the offer, and a (3) valid (legal and valuable) consideration. Each party to a contract acquires rights and duties relative to the rights and duties of the other parties. However, while all parties may expect a fair benefit from the contract (otherwise courts may set it aside as inequitable) it does not follow that each party will benefit to an equal extent.”<sup>2</sup>

The concept of contracts is central in New Institutional Economics (NIE): “Whatever the rules of the game, the lens of contract is also usefully brought to bear on the play of the game. This latter is what I refer to as private ordering, which entails efforts by the immediate parties to a transaction to align incentives and to craft governance structures that are better attuned to their exchange needs. The object of such self-help efforts is to realize better the mutuality of advantage from voluntary exchange” (Williamson 2002, pp. 172). Institutional economics goes beyond considering the rules of the game (ownership) and involves the game (described as contract). Williamson calls this level governance. “...Governance is an effort to craft order, thereby to mitigate conflict and realize mutual gains” (Williamson, 2000, p. 599). This fits also with the understanding of governance of authors from the classical institutionalism: “Governance is about forming institutional structures. It concerns making social priorities, resolving conflicts and facilitating human coordination (cf. also Paavola, 2007)” (Vatn, 2010). In Contracts2.0 our research interest is to understand the contract-based governance in terms of who plays the game and how they play the game. Considering perspective of classical institutionalism (Vatn, 2005) this also implies better understanding of the normative aspect e.g. distribution of rights and motivations of actors (Vatn, 2010). The feedback loop of specific governance on the motivation of actors (e.g. crowding in and out of financial incentives) are an explicit part of the consideration.

We can distinguish three types of governance: a) hierarchies, b) markets, and c) community management.<sup>3</sup> Few real-world governance systems are based on just one type. Typically, they co-exist, as they may even depend fundamentally on each other (Vatn, 2010). A market represents a system of voluntary exchange. In this system, contracts are the core elements. Thus, in our

<sup>1</sup> contract. (n.d.) Burton’s Legal Thesaurus, 4E. (2007). Retrieved April 2, 2020 from <https://legal-dictionary.thefreedictionary.com/contract>

<sup>2</sup> contract. (n.d.) Business Dictionary. Retrieved April 2, 2020 <http://www.businessdictionary.com/definition/contract.html>

<sup>3</sup> See Concept note 5 for further explanation of terms.

understanding, contract-based approaches belong to the category of market-based approaches. This aligns with the definition of contracts above. This somewhat narrow definition of contracts helps to focus the research in the project, however, we recognise there are hybrid forms and fluid boundaries and will also consider examples that do not neatly fit definitions<sup>4</sup> where they can inform the objectives of the project.

### Different types of agri-environmental contracts<sup>5</sup>

In Contracts2.0 we will focus on contracts that support the provision of ecosystem services through adapted land management (Figure 1). The contracts target a better provision of ecosystem services. Thus, contracts organise and govern the exchange between the provision of ecosystem services and direct or indirect economic benefit.

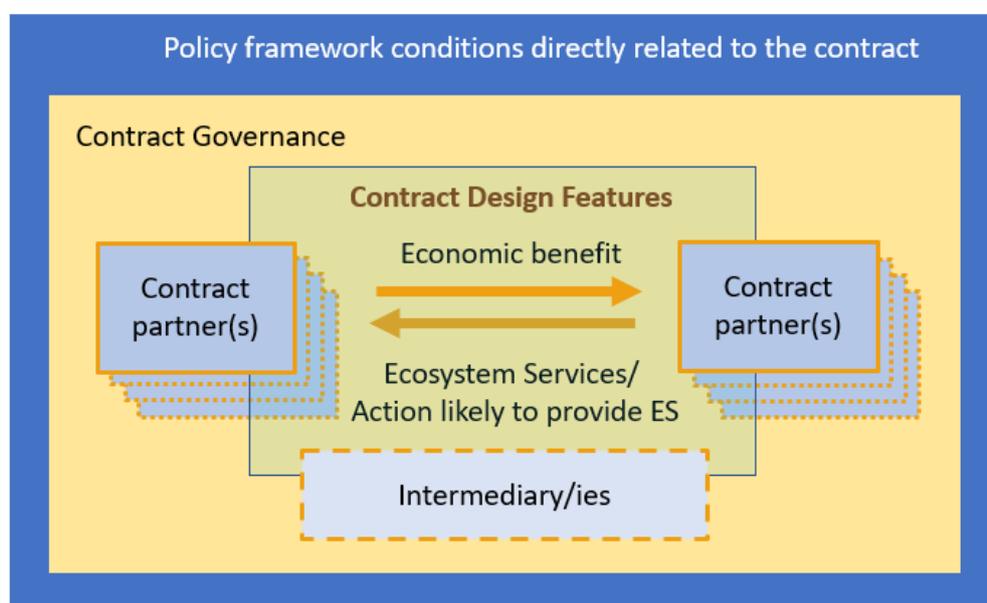


Figure 1: Conceptual framework: Agri-environmental contracts as embedded in relevant policy frameworks and shaped by contract governance arrangements (ES = ecosystem service; own figure by Matzdorf & Prager)

We distinguish three different contract types: 1) Payments for Ecosystem Services (PES) contracts including agri-environment climate measures (AECM), 2) Land tenure contracts, and 3) Contracts associated with the value-chain.

- 1) Under **PES/AECM contracts**, farmers / land managers receive **direct payments** for the direct provision of ecosystem services and biodiversity (result-based contract,) or indirect provision of these services (land management likely to provide ES = action-based contract).
- 2) Under **land tenure contracts**, land managers receive **economic benefits** through e.g. the lease of benefits for the direct provision of ecosystem services and biodiversity (result-based contract) or indirect provision of these services (land management likely to provide ES = action-based contract).

<sup>4</sup> Some examples are provided in the concept notes, e.g. Concept note 4.

<sup>5</sup> Agri-environmental contract is shorthand to include contracts associated with PES schemes, AECM and other contracts relating to the improved provision of environmental public goods.

- 3) In the context of **value-chain contracts**, farmers receive **economic benefits** through higher product prices or good purchase conditions for the direct provision of ecosystem services and biodiversity (result-based contract) or indirect provision of these services (land management likely to provide ES = action-based contract).

Two further distinctions among all three contract types are that a) they can have a result-based or action-based contract design and b) they can have a collective design.

- a) The question of **result-based or action-based contract design** is of key interest. Synonyms are outcome-based or input/ management-based contracts. Result-based schemes pay land managers for achieving set environmental outcomes (such as presence of particular species) rather than for performing prescribed management actions (such as mowing on specific dates). Advantages of result-based contracts are that they e.g. allow maximum flexibility for land managers as long as required results are provided, and also incentivise land managers to innovate, thus, theoretically at least, drawing on their experience and local knowledge to achieve better and more cost-effective results (Matzdorf et. al., 2008, Burton & Schwarz, 2013). In practice, there are pure result-based schemes as well as action-based schemes with result-based elements (Burton & Schwarz, 2013, Herzon et al. 2018). Until now, the question of result- versus action-based has mainly been discussed as contract feature of PES contracts.
- b) A further design feature refers to the actors who are directly involved, i.e. the contract partners. More than one contract partners may be involved on either side. Contracts can either be arranged individually or collectively. For example, a government body administering AECM may set up contracts with individual farmers (bilateral contracts), or with a group of farmers (i.e. **collective contracts**, sometimes called group contracts or cooperative contracts). A value chain contract may involve a group of producers and a single retailer, as well as a number of contract partners along the value chain including (processors, market distributors, consumers).

In addition, there are many more contract design features such as contract period, flexibility, payments, and transaction costs (see e.g. concept notes 2 and 6).

**Contract design features** are embedded into contract governance overall (Figure 1). In addition to the actual contract partners, there are often further actors involved in the design and implementation of a contract. Specifically, intermediaries play a crucial role (e.g. Vatn, 2010, Meyer et al. 2016) and can be directly involved in helping set up contracts, identifying contract partners, and negotiating conditions. Some governance arrangements require the collaboration of different actors to develop and implement contracts. Such kind of collaboration is not a contract design feature *per se* but an aspect characterising collaborative (contract) governance. Collaborative approaches to agri-environmental management and governance are often but not always interlinked with collective contracts. Both are of interest for the design process and its characteristics, as well as the implementation of the contract and its evaluation.

Contracts and **contract governance** are framed by regulatory and incentive-based policies that influence the implementation of contracts in an agri-environmental context. We distinguish those policies that directly target contracts, such as the Common Agricultural Policy (CAP), including Rural Development Programmes and agri-environment schemes, and those policies that are part of the wider institutional arrangements with an indirect influence on actors and their willingness and ability

to engage in contracts. Some policy instruments such as Rural Development Programmes are more adaptable and shape the contract governance, e.g. through their 6-year-planning cycle and adjustments to agri-environment schemes. The latter policies are what classical institutional economics would consider ‘constraints’.

### Overview of how we approach contracts within our project

To investigate contract governance we will conduct institutional analysis (including the policy and regulatory context as well as the informal rules that govern actors’ behavior) and undertake an institutional comparison under consideration of transaction costs (WP2). The actors in our Contract Innovation Labs (CILs) and Policy Innovation Labs (PILs) are the ‘players of the game’ trying to improve existing or developing new contracts (WP3 and WP4). Actors of WP3 focus on the design features of innovative contracts and on the actors required for innovative governance models. Actors in WP4 assess the current policy framework for innovative contracts and develop supporting policy framework conditions in order to upscale the contracts developed in WP3. WP5 explores the design features of PES contracts and value-chain contracts and analyses farmer preferences for different contract design features and actors’ behavior with regard to collective contracts. Furthermore, we analyse consumer preferences with regard to label-based approaches within value-chain contracts.

Based on our understanding and definition of contracts we prepared a range of concepts notes (Table 1) that bring together the different disciplinary perspectives and link them to the project’s key question on agri-environmental contracts.

Table 1: Overview of concept notes

1	Environmental public goods and ecosystem services
2	Payments for Ecosystem Services (PES)
3	Land Tenure and Property Rights
4	Collaboration and collective contracts
5	Institutional analysis
6	Transaction costs

## KEY CONCEPTS IN CONTRACTS2.0

### Concept Note 1: Environmental Public Goods and Ecosystem Services

**Author team:** Lenny van Bussel, Jens Rommel, Birte Bredemeier, Marina Garcia-Llorente, Francis Turkelboom

#### Environmental public goods

In the standard economics literature, goods are classified by the rivalry of consumption and excludability, resulting in four types of goods: public goods, club goods, common pool resources, and private goods (see Table 2). These classifications are meant as broad and abstract categorisations, and similar goods can move between categories depending on context (property rights, transaction costs, costs of exclusion etc.). For instance, a road could be a common pool resource if it is open and congested, a public good if it is open and non-congested, a private or club good if access is restricted.

Table 2: Classification of goods

	Non-excludable	Excludable
No rivalry of consumption	<i>Public goods</i> , e.g., street light, clean air	<i>Club goods</i> , e.g., non-congested toll road, restricted access to a website (Spotify)
Rivalry of consumption	<i>Common pool resources</i> , e.g., open pastures, ocean fish stock	<i>Private goods</i> , e.g., chocolate bars

Historically, it has been argued in economics that public goods are underprovided (Olson, 1965) and that common pool resources are generally overused (Hardin, 1968). As a consequence, government regulation or privatisation have been promoted. This view has been challenged by political scientist Elinor Ostrom (1990) who identified “design principles” that mediate successful common pool resource management (at least at a small scale). As a consequence, optimal management options of natural resources that entail common pool resources or public goods must be identified on a case-by-case basis.

Carefully designed case studies and multi-method approaches culminated in the social-ecological systems framework that identified a wider set of conditions and variables affecting sustainable natural resource governance (Ostrom, 2009; Poteete et al., 2010). Criticism of this model often mentions the implicit ontology (methodological individualism and localism which would lead to a frequent neglect of structural and global market forces).

#### Ecosystem services

An increasingly applied concept related to public goods is ecosystem services. Ecosystem services have been defined as the benefits that people directly or indirectly obtain from the environment (Millennium Ecosystem Assessment, 2005). This definition includes ecosystem goods (such as food) and services (such as climate regulation) (Costanza et al., 1997). In contrast to the concept of public goods which was developed within neoclassical economics, the concept ecosystem services has a theoretical background in environmental science. In the 1970’s and 1980’s, researchers started to

work with the concept of ecosystem function, to analyse the benefits that ecosystems provide to society (Bouma and Van der Ploeg, 1975; Heuting, 1980). De Groot (1992) defined ecosystem function as ‘the capacity of the ecosystem to provide goods and services that satisfy human needs, directly or indirectly’. The state and the functioning of the ecosystem influence ecosystem functions. An ecosystem function may result in the supply of ecosystem services, if there is a demand for the concerned good or service. For instance, the function ‘production of firewood’ follows from a range of ecological processes like photosynthesis and water uptake from the soil. And the amount of firewood demanded by a local community defines the amount of firewood extracted from the ecosystem (Hein, 2010).

Several classification systems exist to categorise ecosystem services. For example, TEEB (2010) distinguish provisioning, regulating, habitat, and cultural services (See Table 3 for definitions and examples).

Table 3: Classification of ecosystem services

Ecosystem service classes	Examples
<b>Provisioning services</b> are ecosystem services that describe the material or energy outputs from ecosystems.	Cultivated plants for nutritional purposes, raw materials like wood, and fresh water
<b>Regulating services</b> are the services that ecosystems provide by acting as regulators e.g. regulating the quality of air and soil or by providing flood and disease control.	Air and water quality regulation, moderation of extreme events like flooding, pollination and natural pest control
<b>Habitat services</b> highlight the importance of ecosystems to provide habitat for migratory species and to maintain the viability of gene-pools.	Habitats that provide everything for individual plants or animals needs to survive
<b>Cultural services</b> the non-material benefits people obtain from ecosystems.	Recreation possibilities, tourism, and aesthetic appreciation of the natural environment

Ecosystem services can be classified as rival (e.g. wood harvested from a forest) or non-rival (recreation possibilities like enjoying beautiful views over a landscape). An example of an excludable ecosystem service is the hiking possibilities on a private property (i.e., a *club good* in the economics definition above). In contrast, hiking possibilities in a public nature area are an example of a non-excludable ecosystem service (i.e., a *public good* in the economics definition above).

Agricultural landscapes provide and receive several ecosystem services (Figure 2, TEEB). On the one hand, farmers utilise the capacity from the ecosystem to provide crops and materials for the production of food, feed or fuel (private goods). Ecosystem services provided for this purpose by the natural environment are for example pollination, nutrient cycling and natural pest control. The use of such ecosystem services for agricultural products presumes the modification, improvement or impairment of an ecosystem’s capacity (Huang et al. 2015, von Haaren et al. 2014) by means of

significant inputs from human systems such as fertiliser or technology (see the ‘inputs’ in Figure 2). On the other hand, agricultural landscapes can also provide regulating, cultural and habitat services like carbon sequestration, possibilities for recreation and habitat services (i.e., public goods). Depending on the management of the agricultural system, the provision of these ecosystem services can be impacted negatively through for example loss of wildlife habitats, nutrient runoff, sedimentation and pollution of waterways, as well as greenhouse gas emissions (Power 2010; Swinton et al., 2007).

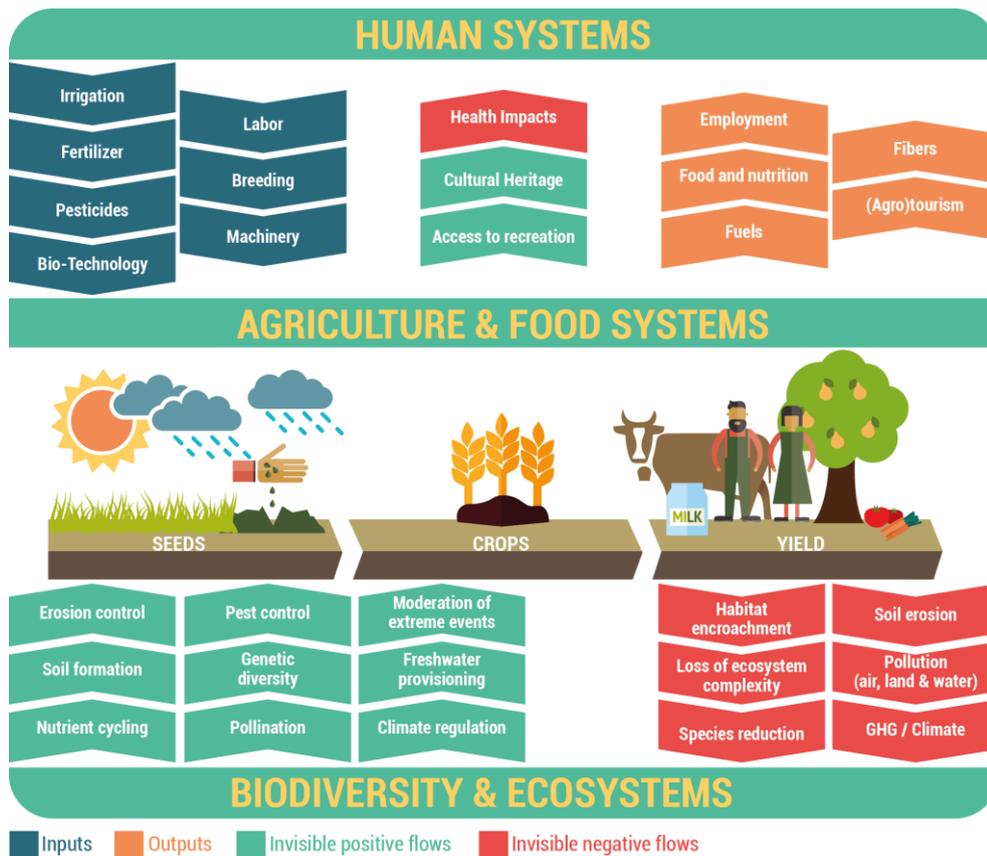


Figure 2: Illustration of inputs, outputs, positive and negative flows between natural and human systems (TEEB, <http://img.teebweb.org/wp-content/uploads/2016/02/02.png>)

### Challenges of managing environmental public goods and ecosystem services

In the context of natural and agricultural environments, there is a large debate and literature on public goods and common pool resources. For common pool resources, there is the risk of overuse – the so-called ‘tragedy of the commons’ (Hardin 1968). For public goods, there is a risk of under-provision. In principle, if perfect markets (perfect information, zero transaction costs, perfectly defined property rights) would exist for these goods, this would ensure an equilibrium where the value of the good would be high enough to provide an incentive to manage them sustainably (a situation famously described in Ronald Coase’s seminal article “The problem of social cost”, 1960). Unfortunately, markets for public goods and ecosystem services are not perfect (asymmetric or missing information; transaction costs are substantial; property rights are often ill-defined; future generations’ preferences are not known). At the same time, economic benefits of public goods and ecosystem services such as conservation of biodiversity and carbon sequestration can be large. As these economic benefits often do not accrue to the local ecosystem manager, unless appropriate

Payment for Ecosystem Services schemes are in place (Hein, 2010) there is a role for public policy (improved policy instruments in Contracts2.0) or the development of markets (value chain approach in Contracts2.0).

### How the concept has been applied

A wide range of factors has been shown to affect public good provision at the individual level (much of the evidence stems from laboratory experiments, but has been tested in the field). These include but are not limited to rewards and sanctions; communication and trust; altruism, reciprocity and self-interest; attitude to the environment; social norms and culture (e.g. Bremer et al. 2014, Calvet et al. 2019, Chen et al. 2009, Defrancesco et al. 2018).

Examples of application with a focus on governance aspects include:

- Strengthening nature conservation policy in the frame of the Convention of Biological Diversity and the EU Biodiversity strategy 2020
- Implementation of legislation for management of water resources (e.g. Water Framework Directive); mapping and assessment of ecosystem services (MAES) produces comprehensive information on water quality and quantity and, thus, facilitates more efficient protection and management
- Visualisation of trade-offs resulting from different land use alternatives.

### Significance to Contracts2.0

The “private-public good dynamic of ecosystem services” (Fisher et al. 2007) and the benefits they provide set the framework for the Contracts2.0 project and guide the activities of all work packages. The concept allows the potential of the provision of public goods to be assessed along with private goods, and for economic and ecological aspects to be considered simultaneously. It is therefore an important concept for the ex-post evaluation of existing contractual approaches in WP2 and also for the development of ‘dream contracts’ in WP3 and the upscaling of contracts in WP4.

For a sustainable and more targeted (re)design of contractual approaches and policy instruments, the ecosystem services concept can provide guidance on identifying critical environmental goods and services, and developing management options and production conditions to promote these environmental goods and services. The ecosystem services concept can improve deliberative and coordination processes among administrative, political and land use actors. It also offers the possibility to standardise assessment and evaluation methods in order to generate meaningful results when comparing different types of contracts and their impacts. This information can be used for economic valorisation of environmental public goods, e.g. in the sense of payments for ecosystem services (see Concept Payment for Ecosystem Services), via agri-environmental measures, which support land-use or agronomic practices that improve the state and functioning of (agro-) ecosystems.

### Strength and weaknesses

A major strength of the **public good concept** in economics is its simplicity and the ease with which it can be operationalised for empirical studies such as laboratory experiments. That being said, a lot of context and complexity is typically ignored in standard economic applications. These challenges can be addressed by a deliberate attempt to complement methods (cf. Poteete et al., 2010).

Conceptually, working with nested games or ecologies of games may help in capturing and making explicit some of the complexities and interactions among different action situations (cf. Kimmich, 2013). In Contracts2.0, we address this challenge by working with co-designed public goods game experiments that also carefully document the qualitative aspects of the co-design process (WP5).

In contrast, the **ecosystem services concept** is very concrete and closely linked to ecological functions of agro-ecosystems. Yet, the quantification of ecosystem services poses a major challenge and requires in-depth knowledge, as well as value judgments. Ecosystem and social system complexity (and dynamics), possible tipping points, and high levels of uncertainty may juxtapose such attempts, and some have argued that it is even impossible to value nature (Farrell, 2009). In Contracts2.0 we do not take this strong position, but we will take great care in the communication of uncertainties when presenting monetary values of ecosystem services. Deliberate valuation techniques can help in making explicit the diverse viewpoints and judgments of heterogeneous stakeholder groups (Lienhoop et al., 2015).

### **Methodological implications and typical methods**

In economics, laboratory public goods games are the most commonly applied method to identify the various factors driving **public good provision**. These experiments typically manipulate factors such as rewards or punishments for cooperation, group size, or endowment heterogeneity (see Zelmer, 2003 for a meta-analysis). Juan-Camilo Cardenas was among the first to apply such games to field populations in the context of resource use (Cardenas et al., 2000). Since then, the literature has been growing rapidly, and economic experiments (including public goods games) are also increasingly applied to study agri-environmental programs (see Palm-Forster et al., 2019 for a recent review and Bouma et al., 2019 for a recent example). Other methods include econometrics (using both micro-level household data as well as country level data).

**Ecosystem services** are often quantified in natural units through the use of bio-physical or ecological models used by natural scientists. The economic valuation would usually rely on the various methods used in environmental economics, i.e., revealed and stated preferences techniques, such as the travel cost method, hedonic pricing, contingent valuation, or discrete choice experiments. In Contracts2.0, we will among other things, use discrete choice experiments to estimate the willingness-to-accept and the willingness-to-pay of farmers, consumers and other decision-makers.

## Concept Note 2: Payments for Ecosystem Services (PES)

Author team: Céline Dutilly, Dieter Mortelmans, Bettina Matzdorf

Payments for ecosystem services (also known as payments for environmental services), are payments to farmers, landowners or land managers who have agreed to take certain actions to manage their land to provide an environmental service. Figure 3 gives an overview of where PES are located within the landscape of economic incentive instruments.

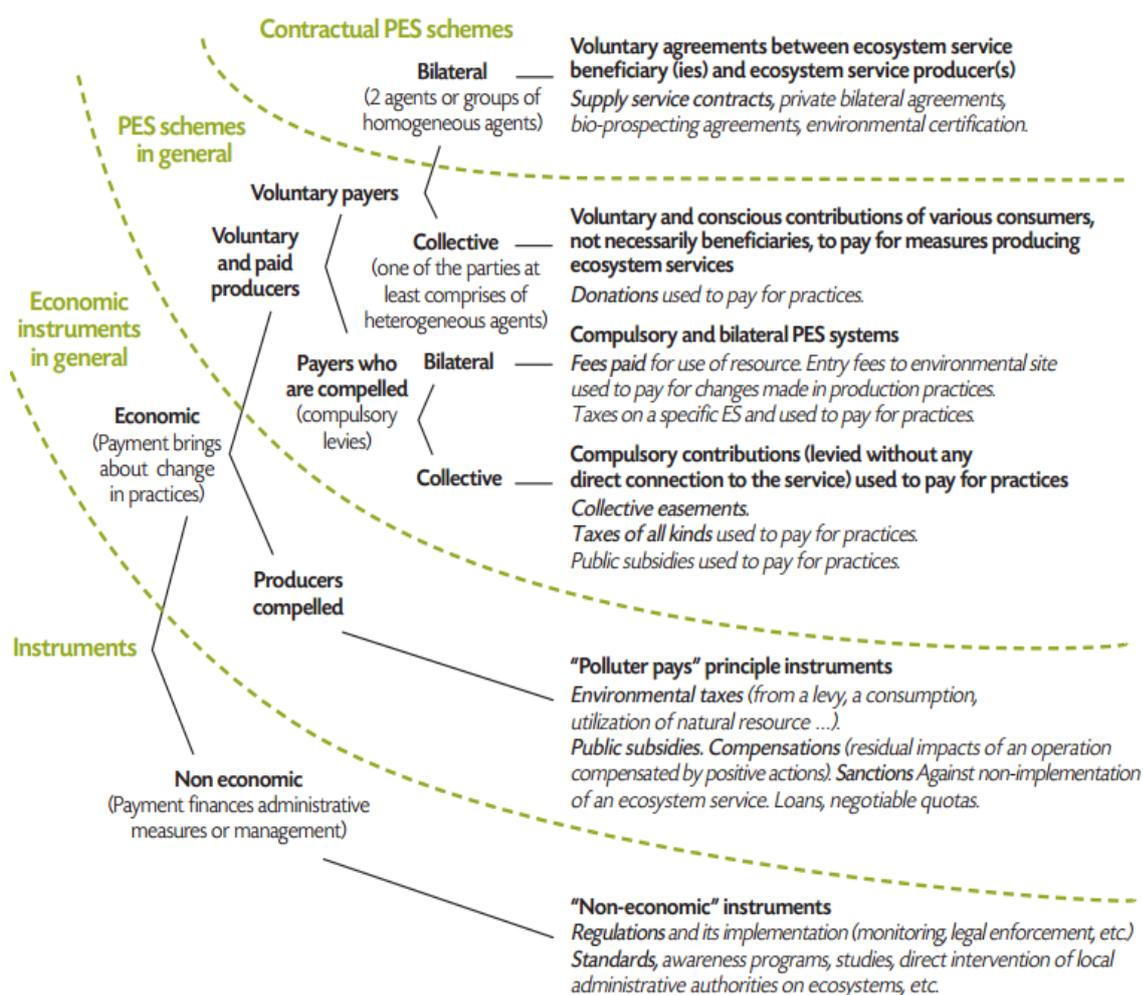


Figure 3: Position of voluntary and collective PES systems (Laurans et al. 2012, p52)

### Major authors and their disciplines

We can distinguish two communities of economists who have investigated PES research field. A key distinction is whether to use market-based instruments or non-market-based instruments.

**Environmental economics** conceive PES as a *Coasean* solution to environmental externalities i.e. a market instrument conceived as a direct negotiation between private parties. In this case, it is common to portray PES as being based on the ‘polluted pays’ principle. Wunder (2005:3) proposed a first definition of PES in 2005 that constituted the ideal-type of PES : ‘a voluntary transaction where a

well-defined environmental service (or a land-use likely to secure that service) is being ‘bought’ by a (minimum one) environmental service buyer from a (minimum one) environmental service provider if and only if the environmental service provider secures environmental service provision (conditionality).’

The theorists acknowledge that PES systems can resemble an environmental subsidy (referring then to *Pigouvian* PES), when payments are made by a government agency or general tax funds such as the AECM in Europe (Sattler & Matzdorf, 2013). In addition, the literature distinguishes compensation schemes consisting of payments made to offset foregone income due to the changes in agricultural practices from the rewards made to enhance or continue to maintain environmental services (Swallow et al., 2009). The literature also distinguishes ‘land restriction PES’ (payments made to reduce deforestation or the use of agricultural inputs like pesticides) from ‘asset-building PES’ that promote some activities (for example, the planting of living fences, or trees). Environmental economists have mainly been involved in assessing the impacts of PES (Alix-Garcia et al. 2012; Robalino and Pfaff, 2013), or identify means to improve their efficiency (Engel et al., 2008).

**Ecological economics** use a broader definition for PES. The main authors representing this approach are Muradian et al. (2010:1205) who define PES as: “A transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources”. They consider PES as an economic incentive that has to be understood in relation to social, moral, or other non-economic incentives and may question the “result-based” component of the PES ideal-type (Figure 4). They question the extent to which the environmental service (ES) being provided can be specifically and clearly assessed and measured and consider that even though ES are often poorly defined this does not constitute a serious problem (Farley and Costanza, 2010).

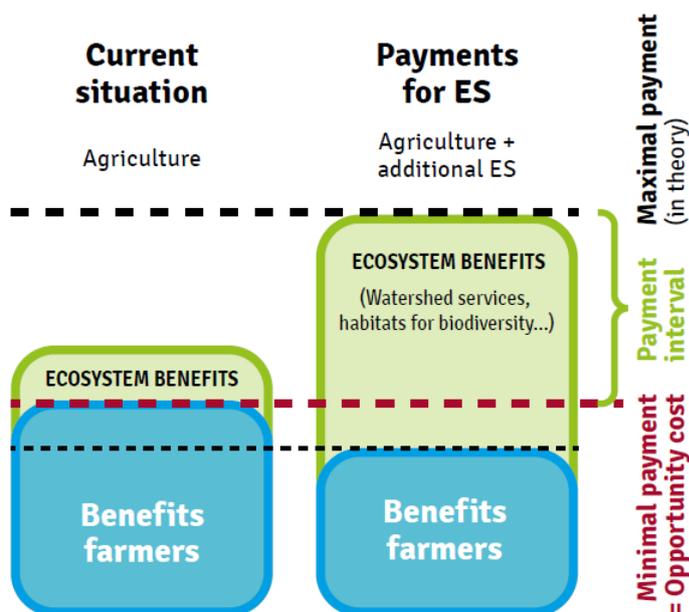


Figure 4: Payment interval for ecosystem services in an agricultural context (PESMIX, 2014)

**Social scientists** offer alternative conceptualisations of PES and explore the role of culture, agency, social diversity and power relations in the shaping of PES institutions and their outcomes (Van Hecken et al., 2015).

**Political scientists** have investigated the policy context of PES implementation and its inscription in the national policymaking. One important research area has been the trade-offs between efficiency objectives with other social objectives. For example, in Mexico, Shapiro-Garza (2013) show how PES have been developed as a hybrid instrument in the course of multi-actor negotiations in the early years of its implementation, by including a form of subsidy to fight rural poverty and target the most marginal communities. In the same way in France, some AECM (like the “grass premium”) were originally implemented with the objective of re-establishing some equity in the spatial allocation of the first pillar that was favouring the highest productive areas (Bazin et al., 1996).

### How the concept has been applied

Although not labelled as such, PES schemes were first applied in 1985 in the USA with the Conservation Reserve Program (CRP) that was preventing soil erosion on cultivated lands, and by the UK implementing in 1987 the Environmentally Sensitive Areas Scheme (ESA) to promote the conservation of landscape beauty and wild fauna.

The use of the term ‘payments for environmental services’ gained currency a decade later when PES programs were introduced in Latin America as a new instrument to support forest conservation activities. Costa Rica’s national PSA (Pagos por Servicios Ambientales) initiated in 1996 is one of the most well-known schemes. Other experiences include Mexico’s Payment for Hydrological Environmental Services programme (PSA-H) in 2003, Ecuador’s Sociobosque programme in 2008. Beside these national programs, many local initiatives have developed mainly in the area of water management, which portrays PES’s ideal-type. Many public or private companies that generate hydro-electric power or distribute municipal water levy specific charges that are included in users’ bills to fund a compensation scheme for farmers located upstream of the watershed.

Examples from Europe are the UK’s Environmental Sensitive Areas (ESA) scheme, and the example of PES by Vittel in France. Since the early 1990s, the Nestlé Waters Company pays farmers whose farms border the water source to stop using pesticides and to permanently modify their farming and livestock rearing practices. Other PES examples described by Wunder et al. (2018) are the Countryside Stewardship Scheme (CSS) – i.e. the agri-environment scheme funded under the English Rural Development Programme, the Norheim model project and the Payments for Watershed Services Munich in Germany, or the Payments for Carnivore Conservation in Sweden.

### Strengths and weaknesses

Although the design principle of PES is relatively clear, its implementation requires a number of implicit conditions, among which are:

- **Leakages.** PES schemes apply on a delimited area and they should not lead to a reduction of ES in another area. This phenomenon of leakage can happen in the case of payments for carbon sequestration or for biodiversity promoted through reduced deforestation: the deforestation pressure could simply be deviated to another area not covered by a PES program.
- **ES Trade-off** (link to Concept note 1). PES schemes remunerate the provision of a single ES (carbon, biodiversity, water quality and/or quantity) or the provision of various ES as a bundle.

This has important ecological implication as the commodification of a single ES could affect the synergies and trade-offs among ES (Rodriguez and al., 2006).

- **Bundles of (land) rights** (link to Concept note 3). PES beneficiaries should possess an individual or collective land title or an effective property right with the capacity to exclude a third party from the area covered by the contract. This implies as well that they are considered a legal person and that this right is not subordinated in space and time to another legal framework that contradicts the implementation of the PES program.
- **Additionality vs equity**. In the mainstream PES literature, PES must be efficient<sup>6</sup> meaning the service should be additional and measurable in reference to a counterfactual scenario or reference scenario (Wunder, 2005). This objective is criticised by authors (Pascual et al., 2010; Proctor et al., 2008) who support instead social equity and consider that favouring the reward of past or current good practices (without necessary additionally) may enhance the recognition of nature conservation as a valuable social objective. Also, it is possible to create additionality while still maintaining a downward trend of ecosystem service provision in the long term. Hence long-term monitoring is important to consider.
- **ES provision thresholds**. When ES provision is critically low, meaning it has reached an important provision threshold that makes its value critical to society, then PES is no longer an efficient mechanism to manage ES provision (Farley and Costanza, 2010).

## Methodological implications

PES experience and the literature surrounding it can bring important elements to envisage “dream contracts” in Contracts2.0 project and in particular to approach the result-based and collective dimensions of agri-environmental contracting.

### PES & contract design principles

Engel (2016) compares various contract design features. Some of them are of particular interest to the project, e.g. payment amount, contract length, conditionality (action- or results-based), unit of control (individual or group of providers), payment (payment to individuals or groups/ collective contracts), additionality, and targeting to specific sites. More broadly, literature discussing PES desirable design features and PES implementation practices can bring useful elements to the project (Wunder, 2018; DEFRA, 2013).

### PES & Result-based approach

To date, the majority of PES schemes are input-based schemes (Wunder, 2008) and the amount of remuneration is based on the producers’ loss of earnings (or opportunity costs) rather than on an overall economic value of ecosystem services. Moreover, Engel (2016) presents a literature synthesis of advantages and shortcomings of result-based PES. On the one hand, result-based schemes are advantageous when it is less costly to monitor outcomes than activities, and they can induce farmer innovation by allowing flexibility about how to deliver the desired outcomes. On the other hand, ES results often also depend on external factors (e.g., weather, natural forest fires) which pushes the risk of non-delivery onto service providers who are often risk averse. Therefore, some authors have

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<sup>6</sup> Depending on the actors involved, ‘effectiveness’ may be more important, for example authorities managing state owned National Parks do not require efficiency *per se*, but would look for payments to have the desired effect.

proposed mixed schemes where part of the payment is based on activities and the other based on results (Derissen and Quaas, 2013; White and Sattler, 2012).

#### PES & collective approach

Several PES programs are contracted by communities. In this context, the link between economic incentives and collective action has been studied (Muradian, 2013; Kazcan et al., 2017) and could offer interesting comparison with some Contracts2.0 case studies (e.g. France, Hungary).

## Concept Note 3: Land Tenure and Property Rights

**Author team: Claudia Sattler, Rena Barghusen, Eszter Kelemen, Erling Andersen**

### Introduction

In simple terms, land tenure systems determine who can use what resources for how long, and under what conditions (FAO, 2002). As such, all agri-environmental commitments fixed by contracts are an integral component of land tenure. Land tenure determines how property rights to land are to be allocated to different parties within a given society. Land tenure typically is differentiated into private, communal, open access and state land tenure, specifying who holds different land-related property rights. Property rights thereby include bundles of rights, which can be categorised into access, withdrawal, management, alteration, exclusion and alienation rights, where the single rights within the bundle can either be assigned to an individual or distributed among several parties.

### Key components of the concept

Land covers about 30% of the surface of the earth and is subject to a wide range of different land uses, which include use for forests, arable and grassland, amongst others (Vatn 2015). Rules of tenure then define how property rights to land are to be allocated to different parties within a given society. They are either defined legally or customarily among people and determine who can use land along with the responsibilities and constraints. Due to the multiple interests that different stakeholders may have, land tenure can evolve within a context of intersecting interests, which can be typified as overriding, overlapping, complementary or competing (FAO 2002). In this context well defined land tenure and property rights are useful to avoid such kinds of conflicts in case of converging interest, while ambiguous or ill-defined land tenure and property rights can spur conflict among parties.

For land tenure usually four forms are differentiated which specify WHO holds the related property rights (cf. FAO 2002, Vatn 2015: 135ff):

- **Private land tenure:** assignment of rights to an individual private party, such as a single individual, a household, a corporate business, or similar (e.g. private ownership of agricultural land, tenancies)
- **Communal land tenure:** assignment of rights to a community where each member holds the rights and non-members are excluded (e.g. community ownership of land, commons land)
- **Open access land tenure:** assignment of rights to anyone and no-one can be excluded (e.g. marine tenure of the high seas or other global commons)
- **State land tenure:** assignment of rights to some authority of the public sector, either regarding a centralised or decentralised level of the government (e.g. state forests in some EU member states)

Typically, all four forms can be present in a given society. Furthermore, special forms can be present in single countries, such as 'trusts' entitled to hold land tenure over customary lands on behalf of the citizens (e.g. in the United Kingdom).

In regard to single property rights to land tenure, which specify WHICH rights are held by a certain party, the following distinctions can be made (Galik and Jagger 2015, see also Schlager and Ostrom 1992):

1. **Access:** right to enter a defined unit of land
2. **Withdrawal:** right to obtain goods and services from a defined unit of land
3. **Management:** right to regulate land use and transform a defined unit of land, e.g. by making improvements
4. **Alteration:** right to change the set of goods and services obtained from a defined unit of land
5. **Exclusion:** right to determine who will have an access and how such right may be transferred to others (e.g. through purchase, lease, or inheritance)
6. **Alienation:** right to sell or lease some or all management, alteration and exclusion rights

The above listed property rights are also called ‘bundles’ of rights which can all be held by one individual party or distributed among several parties (e.g. Galik and Jagger 2015).

Furthermore, ‘formal’ and ‘informal’ rights can be differentiated. Formal property rights are explicitly acknowledged in formal laws, while informal property rights often lack official recognition, but are exercised based on customary rights. In this context, also ‘de jure’, and ‘de facto’ rights are referred to, where de jure property rights are the ones codified on paper (legal documents) and de facto property rights are the rights actually exercised in reality (FAO 2002, see also Schlager and Ostrom 1992, Vatn 2015).

Land tenure and property rights are often recorded in some form of register and/or cadaster system (different forms exist across EU member states). In the absence of such a system, information may be held ‘unwritten’ within a community through collective memory, which is often the case for customary rights (FAO 2002). Unwritten documentation can cause uncertainty over land tenure and property rights and thus can lead to conflict and difficulties in the enforcement of rights for involved parties. Land tenure and property rights can be changed through land reforms and other administrative procedures by authority of the national governments or decentralised government bodies.

### **How has the concept been applied?**

Property rights and the rules used to enforce them are, for instance, used by political economists to analyse resource degradation problems. In this context it is important to note that for every right, rules exist that require actions that can be seen as complementary duties. However, rights are also the product of rules that create authorisation. Schlager and Ostrom (1992) distinguish between operational rules that are in use, and collective-choice actions that can change operational rules. Access and withdrawal are operational level rights in a resource system. Rights to management, exclusion and alienation belong to the collective-choice level. The authors developed a scheme to define property rights regimes that array collective-choice rights to users of a resource system ranging from authorised user, to claimant, to proprietor to owner (Table 4).

In view of the distinction between de jure (formal) rights that are enforced by a government and de facto (informal) rights that were established by cooperation among resource users themselves, Schlager and Ostrom (1992) claim the importance of de facto rights because *‘self-organized collective-choice arrangements can produce operational rules closely matched to the physical and economic conditions of a particular site’*. Moreover, such arrangements tend to internalise the costs of monitoring and exclusion among beneficiaries which could reduce inefficiencies (ibid.).

Table 4: Bundles of rights associated with positions (adapted from Schlager and Ostrom 1992)

Type of right	Owner	Proprietor	Authorised Claimant	Authorised User	Authorised Entrant
Access	x	x	x	x	x
Withdrawal	x	x	x	x	
Management	x	x	x		
Exclusion	x	x			
Alienation	x				

Land tenure and property rights can also be applied to promote sustainable land use. For example, in a context of communal land, flexibility of resource use allows to match operational rules to the local physical conditions of the site (corresponding to the right to change management rules). Moreover, incentives to adopt conditions of sustainable land use practices can be provided by offering a long-term lease agreement, for example.

### Application in Contracts2.0

Since land tenure rights define an important framework condition for all contract-based approaches, including the contract types considered in Contracts2.0, different land tenure systems and linked property rights will be considered as an important element of institutional context settings in the analysis of existing contracts in WP2. In Contracts2.0 we focus on three aspects:

1. In cases where the manager does not own the farmland<sup>7</sup>:
  - a. Can environmental objectives be integrated in the contract between the owner and the manager of the farmland?
  - b. Do agri-environmental contracts cater for all farmers regardless of land ownership?
2. In cases where farmland is traded:
  - a. Can environmental objectives be integrated in the contract between the seller and the buyer of the farmland?
3. In cases where the specific land tenure system supports specific environmental services
  - a. Can specific contracts be designed to support the land tenure systems
  - b. Do agri-environmental contracts cater for these land tenure systems

Methods applied to analyse land tenure and property rights in WP2 include, for instance, reviewing and analysing literature on the topic as well as institutional analysis, transaction cost analysis and multi-criteria analysis in WP2. Land tenure and property rights will also be a crucial element for developing and testing new contractual models on the ground in the contract and policy innovation labs (CILs and PILs) of Contracts2.0. Existing expertise of the action partners on land tenure and

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<sup>7</sup> Important aspect given that about half of the agricultural area of the European Union is not managed by the owner, with a current trend of a decline in the share of the agricultural area managed by the owner.

property rights within the different European member states will be included through the CILs and PILs in WP3 and WP4.

In some cases, there will be specific land tenure contracts where land managers or owners receive economic benefits through e.g. the lease of benefits for the direct provision of ecosystem services and biodiversity (result-based contract) or indirect provision of these services (land management likely to provide ES = action-based contract). In addition, there are situations where there is no formal contract established (public access to the countryside, common land). The use of explicit land tenure contracts does not appear to be widespread but Contracts2.0 will consider examples from partner countries to understand how land tenure and property rights come into play. Examples of contracts applying the land tenure approach include:

- Denmark
  - The Nature Agency under the Ministry of Environment and Food rents out farmland under the condition that it is managed extensively.
  - Support for afforestation is given under the condition that the forest is placed under protection eternally
- Germany
  - Schemes on extensive farmland management are linked to biodiversity off-setting.
  - MoorFutures scheme on storage of carbon in peatlands. The permanence is secured by prescribed water levels under the Water Law, entries in the land register to secure permanence of the required water levels, and/or the purchase of land for restoration.

## Concept Note 4: Collaboration and collective contracts

**Authors: Katrin Prager, Rena Barghusen, Jens Rommel**

### Introduction

Collaboration describes a specific process of collective action. It implies that people work jointly towards a common goal, involving regular interaction among the collaborating individuals. This regular interaction is necessary due to the nature of the collective action problem. Bodin (2017) distinguishes two broad classes of collective action problems in environmental governance – coordination and cooperation problems. Collective action problems often occur with eradication of invasive species, for instance. In order to address a coordination problem, stakeholders agree initially on a common goal and then utilise a facilitator or coordinator to achieve it by coordinating the individual stakeholders' activities. By contrast, in cooperation problems stakeholders' interests are diverse and conflicts may emerge so they first need to get involved in negotiations to reach a common agreement. An example could be the reduction of nitrate run-off in a river catchment where extensive farmland is located. According to Bodin (2017), dense collaborative network structures are better suited to effectively address cooperation problems whereas more centralised networks are suited to coordination problems (such networks facilitate coordination without necessitating that actors invest lots of resources in upholding a relatively high number of social ties).

### Collaboration and coordination as a spectrum and a process

The assumption underlying a collaborative approach is that environmental effectiveness of AECM can be increased by aligning management activities at the landscape scale. In the context of agri-environmental management, cooperation problems are common due to diverse land-use interests of land managers, farmers, rural residents, conservation organisations, businesses and other stakeholders. Prager (2015b) introduces a collaboration-coordination spectrum and claims that a coordination approach can be sufficient for cases with clearly defined objectives (and where stakeholders agree on the objectives). Targeted agri-environment schemes that incentivise certain management practices or offer an agglomeration bonus<sup>8</sup> are mechanisms to achieve coordination. However, in more complex and contested cases a collaborative approach is needed to negotiate interests. This is usually the case when agri-environmental management is carried out at a landscape scale. Accordingly, collaborative agri-environmental management means farmers or land managers working jointly towards a common goal, involving regular interaction, in particular with regard to the timing and implementation of environmental management activities on farmland or establishment of landscape elements (e.g. hedge planting and maintenance, mowing regimes).

The relationship between key concepts of collective action, collaboration and coordination is visualised in Figure 5. For the purposes of this research we assume that 'cooperation' and 'collaboration' can be used interchangeably. Specific situations may sit along different points along the spectrum ranging from collaboration to coordination, meaning that boundaries in real world examples are fuzzy. In addition to representing a spectrum, the arrow may also represent a procedural aspect (i.e. time). For example, stakeholder may first need to overcome a collaboration problem (requiring mediation or facilitation) and agree on a common goal; once this is agreed,

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<sup>8</sup> Land managers receive a bonus for spatially coordinated activities.

coordination is needed to ensure the right management is undertaken in the right places at the right time.

Further, we conceptualise collective contracts mainly as a tool to coordinate management, and an intermediary or an agency could coordinate both, individual and collective contracts. In a collective contract, direct collaboration among farmers is not strictly necessary. Collective management, on the other hand, needs direct collaboration, yet it may be undertaken with or without collective contracts.

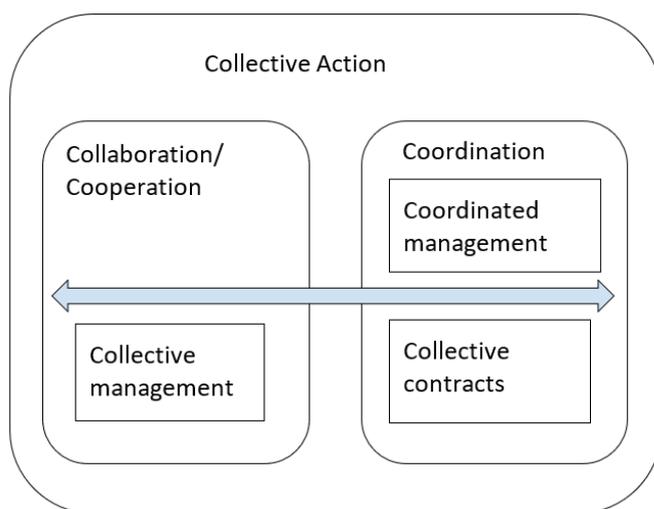


Figure 5: Relationship of key concepts: collective action, collaboration and coordination

The nature of ecosystem services and how they are provided often requires collective action. The formal and informal ways in which the provisioning of ecosystem goods and services is organised and managed is part of environmental governance, which Rival and Muradian (2013, p. 4) refer to as “the institutionalisation of mechanisms for collective decision-making and collective action with respect to natural resource management”. For example, the multi-level nature of many governance situations requires cross-scale and cross-sector vertical and horizontal cooperation among actors. With regard to ecosystem service governance, Sattler et al. (2018) documented a multiplicity of terms prevailing in the literature e.g. collaborative governance, co-governance, adaptive governance, and participatory governance.

### Benefits and challenges

The interest in collaborative agri-environmental management has come from the acknowledgement that individual contracts between the state and the farmer have limited effectiveness and limited benefits to mobile species with larger ranges, water quality and flood management (Kleijn & Sutherland 2003; McKenzie et al. 2013). In particular where land ownership or tenancies (and associated management) is private and holdings are small, there is a need for coordinating activities to achieve outcomes at the landscape or catchment scale. Collaborative environmental management more broadly has also been promoted in non-European contexts, e.g. through Landcare groups and numerous government schemes in Australia, and catchment/ watershed-based approaches in the US. In addition to the collaboration linked to agri-environment schemes and collective contracts, there is also informal agri-environmental collaboration. Examples are farmer groups such as the Nature-friendly Farming Initiative and (self-funded) farmer clusters.

The benefits of collaborative approaches for scheme effectiveness result primarily from spatial coordination and tailoring of measures to local needs (Prager 2015a, 2015b, Westerink et al. 2017a). Increased effectiveness, in addition to capacities to save costs through sharing of resources, also improves the efficiency of a scheme (Schomers et al. 2015). Moreover, there are important aspects resulting from the social interaction that support effectiveness. These range from mutual learning (Prager 2015a) and conflict resolution (Westerink et al. 2017a) to developing social capital (Mills et al. 2011) and a sense of 'ownership' for a scheme which may motivate participants to adopt (further) environmentally beneficial practices (Toderi et al. 2017).

However, there are also disadvantages of collaborative approaches, mainly the increased effort (also referred to as transaction costs, see concept note 6) for collaboration. There is a cost associated with the additional time invested in meetings, discussions and other coordination activities, and problems might not necessarily be solved but new conflicts could also emerge (Coglianese 2010). Additional effort (i.e. costs) have to be taken into account for those stakeholders that are usually not paid for it (e.g. farmers are not paid for the time spent in meetings) (Prager 2015b).

### Application of the concept in CONTRACTS2.0

Collaborative agri-environmental management on-the-ground is embedded and influenced by the governance system in which it takes place. In the context of contract governance, we are interested in both, the collective action *among* contract parties (e.g. farmers within a group signed up to a collective contract) as well as the collaboration *between* contract parties (government agency and farmers; utility company and land managers). Furthermore, the collaboration between intermediaries and contract parties is relevant as it can have substantial influence on the success (or otherwise) of a contract (Vatn, 2010, Meyer et al. 2016). Intermediaries bring together interested parties, help set up contracts, and negotiate the specific details of implementation, i.e. they often take on a coordination role. Collective contracts (group contracts, cooperative contracts) have particular challenges. The design process and its characteristics, as well as the implementation of the contract and its evaluation become important aspects of contract governance.

We investigate the wider institutional arrangements (including governance) for collaborative approaches and collective contracts through the institutional analysis in case studies in several countries (part of WP2). This research will also consider anticipated benefits of social learning in collaborative settings and enhanced motivation. Collaborative initiatives in the agri-environmental context emerged rather informally and from the bottom up but gave rise to a change in the CAP reform for the period 2014-2020. The option of group applications for AES was introduced (cf. Regulation (EU) No 1305/2013, article 28), with collective contracts mainly fostered by the Dutch government.

The Netherlands implemented a mandatory<sup>9</sup> group scheme (**collective contracts with a group of farmers**) to systematically enhance collective action. Since 2016, farmers have to join an environmental farmer cooperative to receive agri-environmental payments. There is only one contract between a cooperative and the public authorities which reduces transaction costs at the governmental level. Individual contracting of farmers is performed within the cooperatives (**the intermediary**) following a prioritisation and coordination of individual measures at landscape scale.

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<sup>9</sup> Joining a group is mandatory if the farmer wants to benefit from an agri-environmental scheme, however, whether or not to enrol is a voluntary decision for the farmer.

The idea is that this can be best delivered by using local knowledge instead of an approach driven by a central authority. The cooperatives have some flexibility in choosing the measures according to pre-defined ecological priorities for their region and in organizing themselves which enables direct involvement of farmers in decision making (Dutch Ministry of Economic Affairs, 2016).

In Belgium (Flanders), in the case of ABC Eco2, there is not yet a general system of collective contracts replacing individual contracts as in the Netherlands. A **hybrid solution** is that they developed an additional level of a different kind of 'collective' contracts where part of the individual payments is transferred to the group which is responsible for carrying out collective agri-environmental management. Some farmers are then paid by the group to carry out specific tasks (e.g. mowing of field margins, management of hedges). Farmers can also buy flower seed mixtures or invest in machinery collectively.

In England, the Countryside Stewardship Scheme (CSS) contains all AECM. Since 2015, it has been enhanced by the Countryside Stewardship Facilitation Fund which is a funding mechanism that pays facilitators to bring together groups of farmers and align their CSS applications with scheme priorities and neighbouring farmers' management activities. In this case, farmers still have **individual CSS contracts**, but in **parallel** sign up to a **group agreement** that includes training, group meetings and coordinated action to deliver environmental benefits.

In France, AECM have a **collective element** in that they can be contracted by land managers of collective pastoral areas. These land managers can either be landowners (communes, pastoral land associations) or land users (pastoral farmers groups). The AECM contractor can choose to keep the contract payment to implement the contract, or to redistribute part of the payment to individual livestock farmers, for example by paying a shepherd to implement a specific pastoral management plan.

Collective contracting will not merely be investigated as a stand-alone approach but also in combination with other approaches. This will generate insights into the effectiveness of combinations, such as adding result-based indicators to a collaborative monitoring approach. This analysis of future options will be carried out in WP5.

## Concept Note 5: Institutional Analysis

**Author team: Katrin Prager, Claudia Sattler, Rena Barghusen, Dieter Mortelmans**

### Introduction

Institutional analysis is concerned with the analysis of the rules (= institutions) that determine the behaviour of people, groups or organisations. Two types of rules are distinguished, formal and informal rules: 1) Formal rules include regulations, laws, policies and legal principles that define, for example, property rights or market transactions; breaking formal rules is at least in principle followed by a sanction. 2) Informal rules relate to codes of conduct, customs, customary rights, and norms embedded in interactions between groups or individuals. Just like formal institutions, informal institutions shape and condition what actors can do, should and should not do. They differ from the formal ones in that they are not explicitly stated or written. The focus of an institutional analysis is on what rules have produced current behaviour, or what rules might produce a different, more desirable behaviour.

Institutional analysis relates to different bodies of scholarly work informed by diverse theories and frameworks (cf. Roggero et al. 2018). It merges approaches from law, economics and organisational studies. In institutional economics, governance is closely linked to institutions because governance is conceptualised as the necessary structures to make rules effective (the “forms, modes and practices of organisation to put rules into practice”).

### Frameworks for institutional analysis

A prominent framework is the Institutional Analysis and Development (IAD) framework by Elinor Ostrom (1990, 2005). The IAD framework has been developed to facilitate meta-analytical and comparative work in order to understand the ways institutions operate and change over time for a certain type of ‘action situation’. It differentiates between a set of five elements for the analysis (Figure 6): 1) the action arena which has a concrete action situation in its core (typically a situation where a decision has to be made, e.g. in regard to what kind of governance approach to apply, what type of resource management to implement, etc.); 2) a set of contextual conditions influencing the action situation (e.g. bio-physical, political, social, etc.), 3) interactions in which action takes place (e.g. interactions between different social actors, social actors and different environmental resources), which leads to 4) certain outcomes resulting from these interactions (e.g. met demands of the different social actors, state of the environmental resource in question. Finally, outcomes are evaluated by 5) specific evaluation criteria, which feed back to the initial conditions.

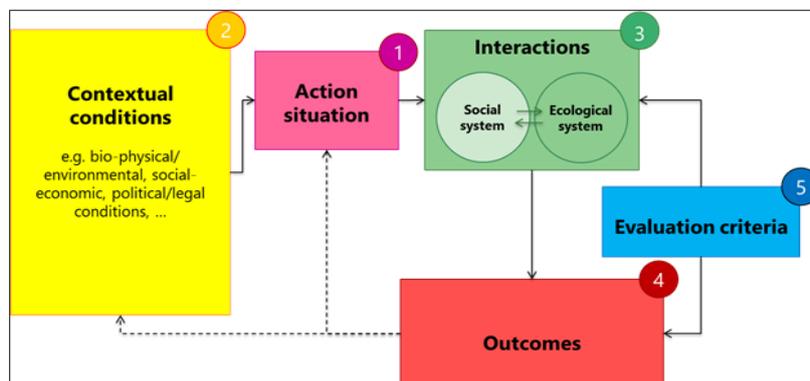


Figure 6: Simplified IAD framework. Adapted from Roggero et al. (2018), based on Ostrom (2005, 1990).

Ostrom's IAD has been extended by Hagedorn (2008) in a framework for analysing nature-related sectors. Hagedorn's Institutions of Sustainability framework has been applied to agricultural soil conservation (Prager 2010). Further developments include a proposition for a "politicised" IAD framework (Figure 7; Clement 2010), to simultaneously consider institutions, the politico-economic context and discourses across governance and government levels in order to allow the generation of policy recommendations (the conventional IAD approach concentrates on describing and analysing a situation). McGinnis (2010) combined the IAD with a social-ecological systems (SES) framework, while Ostrom and Cox (2010) proposed a diagnostic approach to unpacking the SES framework into multiple levels.

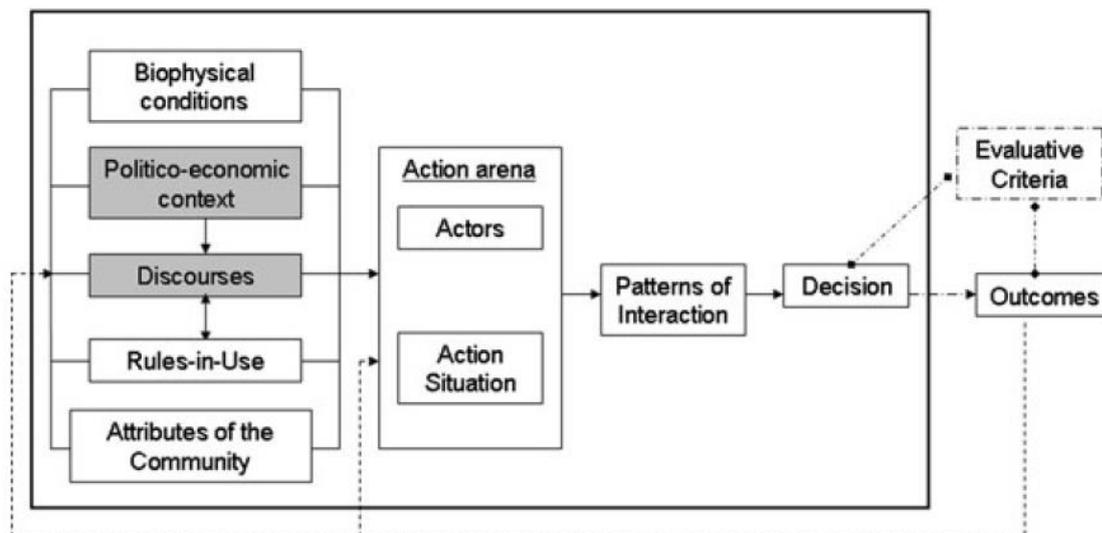


Figure 7: Extended IAD framework; shaded boxes indicating additional components (Clement 2010)

Economic and policy analyses with an institutional focus have aimed at identifying the connection between institutions and conservation behaviour, and even conservation outcomes. Some of the payments for ecosystem services literature has addressed the institutional preconditions of establishing payment schemes and the conservation consequences following from different arrangements. Vatn (2010), for example, provides a systematic evaluation of Payments for Environmental Services (PES) approaches using an institutional perspective. Due to important similarities between payments for ecosystem services and agri-environmental contracts, important lessons can be drawn from it.

### Strength and weaknesses

An institutional perspective allows a comprehensive assessment including social, economic, political aspects as well as bio-geo-physical factors relating to the resource being used. The latter allows integrating ecosystem characteristics and public environmental goods in the analysis. Another advantage of institutional analysis is that it tends to take a multi-level perspective, and includes all possible institutions (both formal and informal) that shape contextual outcomes. Institutional analysis considers causal links and feedback.

Sometimes the method is criticised as too descriptive (e.g. no clear framework for evaluation of institutions) and deriving policy recommendations is not straightforward. Another weakness is the complex and resource intensive (time, knowledge) nature of the method.

## Application in CONTRACTS2.0

When we adapt institutional analysis to the design and implementation of agri-environmental contracts, the sustainable management of environmental assets and ecosystem services in the farmed environment is the action arena (Figure 8). Action situations in sub-arenas include the policy making and implementation activities at different levels as well as the farmer's management decisions and practices on the ground. These action situations will be influenced by the following factors:

- i. the characteristics of the environmental assets/ ecosystems in question (what is managed), embedded in biophysical conditions,
- ii. available technologies, infrastructure and practices (how is it managed),
- iii. the actors involved, their characteristics and their relationships to each other (who manages), and
- iv. formal and informal institutions and governance structures relevant to these decisions (what regularises actors' behaviour).

These factors shape an action arena in which land managers' decision making is taking place (i.e. actors of the CILs), influenced by a governance and policy context that can in part be shaped by policy actors (i.e. actors of the PILs). In addition, land managers decision making is shaped by the cultural context which highly influences the informal rules (which in turn influence the acceptability/ implementability of formal rules). In agri-environmental schemes, an example of informal institutions relates to the shared perceptions and attitudes towards environmental public goods among local farming communities. It has been argued, for instance, that the 'cultural sustainability' and ultimate success of agri-environmental schemes (Burton & Paragahawewa 2011) will rely on a socially driven change in impetus for farmers, wherein the provision of environmental public goods becomes culturally embedded rather than just politically entrenched and financially motivated. Because institutions incorporate and express power relations, they may constrain the available management options, and hence contracts. For this reason, institutions might cause tensions, trade-offs, and conflicts.

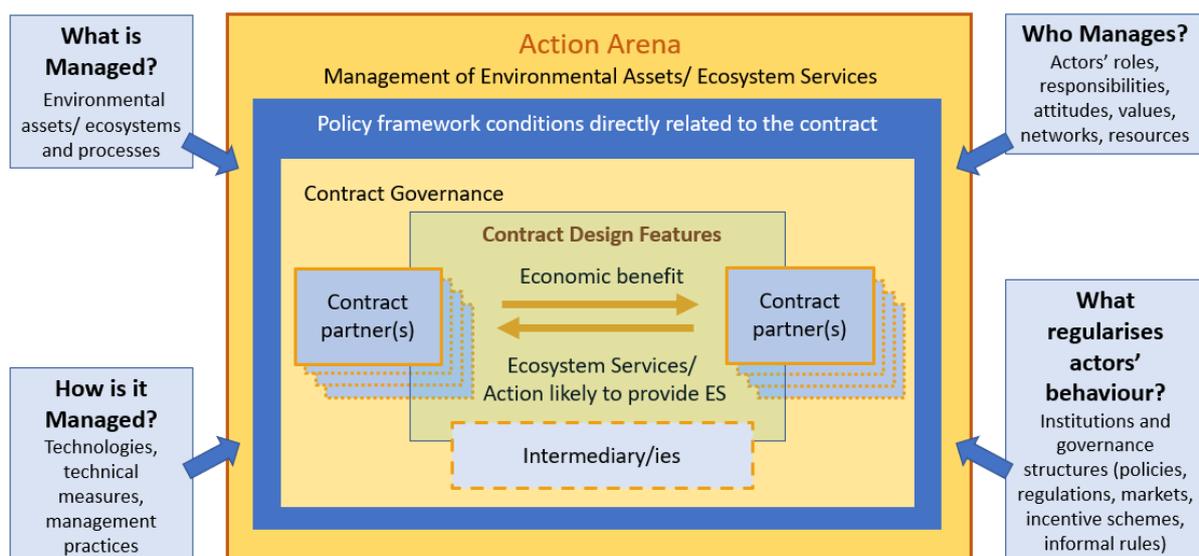


Figure 8: Framework for institutional analysis (adapted from Hagedorn 2008 and Prager 2010), integrating the conceptualisation of agri-environmental contracts in Contracts2.0

Linking back to the introductory section of this deliverable, agri-environmental **contracts represent a governance structure**, as they are the mechanisms that put rules into practice. In governance theory, three different types (or styles) of governance structures exist: hierarchies, markets and collective action (also termed community management by some authors, e.g. Vatn 2010, or network governance, Meuleman 2010). “The central value of hierarchical governance is authority; therefore the output must be authoritative and legitimate. Empathy and trust are central in network governance, and therefore results are expected to be based on consensus. Market governance is based on competition and price, which makes it logical that the best results are the most competitive and cheapest products” (Meuleman 2010, p51). These styles are ideal types and, in real situations, there are mixtures of styles. Nevertheless, each style is internally consistent and has distinct internal logic.

These governance types usually co-exist, and influence the design and implementation of contracts as well as the decision making of actors. Conventional agri-environmental contracts (as currently implemented across the EU) belong to the category of market-based approaches. However, they can also be viewed as representing a hybrid governance structure of market and hierarchical elements. Agri-environmental contracts typically prescribe measures and management activities to be carried out, and they can be classified as a PES type of voluntary governmental payments for voluntary actions (Matzdorf et al. 2014, Schomers et al. 2015).

### **Methodological implications**

Institutional analysis can be carried out in a general and qualitative fashion, or it can be developed into detailed hypotheses and subjected to empirical testing (Primmer et al. 2016). The most frequent approach is an in-depth case study approach. In Contracts2.0, contracts are placed at the centre of analysis, with actors and rules investigated as key components.

Research methods include desk-based review of documents to understand individual and collective actors’ roles in managing the environmental assets and how they influence institutions and decision making. Document analysis is combined with qualitative research (interviews) to generate in-depth insights into how the strength and weaknesses of existing contracts are perceived, what the options are for shaping policies and supporting new contracts that better deliver the desired outcomes. This can cover power relations, processes, outputs and outcomes. As part of WP2, an institutional analysis will be carried out across all case studies at a broader level (tier 1), and in-depth investigation is undertaken in selected case studies (tier 2). The framework of institutional analysis will allow for data to be pulled together, e.g. on the effectiveness of a particular contract (WP5), document analysis of policy instruments providing funding for a certain type of contract, results from stakeholder mapping/ analysis (Net-Map method), or transaction cost analysis (Concept note 6). Further detail on the application of institutional analysis and the evaluation of cases is provided in Appendix B2 in the Analytical Framework (Deliverable 1.2).

## Concept Note 6: Transaction Costs

**Author team: Francesco Riccioli, Roberta Moruzzo, Salomon Espinoza Diaz, Christoph Schulze**

### Introduction

Transaction costs (TC) are the costs arising from organising the transfer of goods and services between two agents (Cheung, 1992) or, in a more general sense, the costs generated by the organisation and coordination of human interaction (Coase, 1960). In the context of agri-environment schemes, TC relate to the time, effort and direct expenditure incurred in activities such as scheme investigation, design, implementation, management and administration of contracts, as well as monitoring and evaluation. TC are essential to consider when assessing whether a government policy (such as an agri-environment scheme) is efficient, or at least cost-effective.

Coggan et al. (2013) suggests that for an environmental policy, TC accrue for the policy maker who designs and administers the policy, and for the private parties who engage with or are affected by the policy. In the specific case of agri-environment schemes a basic distinction can be made between public TC, borne by the government, and private TC, borne by farmers or other private sector actors (Mettepenningen et al., 2009; Krutilla, 2011). A summary of the likely range of transaction costs in agri-environment schemes and their respective distribution among public and private actors is set out in Table 5.

Table 5: Transaction costs encountered in agri-environment schemes (based on Ansell et al. 2016)

	<b>Transaction Cost</b>	<b>When it is incurred</b>	<b>Scheme proponent and administrator costs (Public TC)</b>	<b>Payment recipient costs (Private TC)</b>
<b>Search costs</b>	Information about the problem	Well before the scheme has been decided upon (even many years before)	Identifying, collecting, and analysing data about the problem and potential solutions	Participation in problem scoping and providing information
	Scheme selection and development	Months to years prior to scheme implementation	Examining policy options and consulting with stakeholders	Participation in consultation, lobbying for preferred option
	Establishment	Immediately prior to landholder engagement	Staff training, equipment, systems set-up, advertise and promote	Gathering information about scheme, and preparation to engage
<b>Negotiation costs</b>	Implementation (including repeated implementation)	Initial selection and contracting phase – repeated as needed	Engage with and process participants, negotiate contracts	Engage with scheme, prepare proposals, negotiate contracts

	Transaction Cost	When it is incurred	Scheme proponent and administrator costs (Public TC)	Payment recipient costs (Private TC)
Monitoring and enforcement costs	Scheme management	Ongoing scheme management such as making payments, basic reporting	Make payments, record keeping, engagement as required	Reporting, record keeping
	Landholder monitoring and compliance	After contracting — auditing and any enforcement required	Auditing and verifying reporting, any compliance activities	Defence of compliance activities, additional reporting, etc
	Ecological monitoring and evaluation	Before, during and after scheme (depending on ecological response time)	Data collection and evaluation of ecological outcomes (relative to problem formulation)	Likely to be relatively low
	Scheme evaluation and improvement	During and after contract completion	Analysis of effectiveness, making and implementing recommendations	Lobbying for scheme changes

### Types of transaction costs

TC themselves can be categorised in three major groups: search costs, negotiation costs, and monitoring and enforcement costs (Dahlman, 1979, Hobbs, 2004).

**Search Costs:** Search costs arise ex ante to the transaction and include costs for looking for information on AES. From the private side, farmers may want to compare the AES-option with other alternatives for environmental and landscape management, other alternatives for earning an additional income, improving the image of farming or whatever their objective for taking up AES might be. Farmers may also compare the compensation payment to the expected costs arising from the AES-uptake. These decision-making costs also involve the cost of making the wrong decision as a result of bounded rationality (i.e. not all information is known to the decision maker). From the public side, policy makers and those who administer the policy will have to invest time in activities such as research, information gathering, and analysis associated with defining the problem; enacting relevant legislation, including lobbying and public participation costs, or, alternatively, the costs of changing laws through the courts or modifying existing regulations; design and implementation of the policy, which may include costs of regulatory delay.

**Negotiation costs:** The second category of private TC are negotiation costs, which in the case of AES, can be also called application costs. For farmers, this covers the costs of fulfilling preliminary conditions to be able to apply (such as specific administrative tasks, following a specific training, drawing field maps or taking soil samples) as well as the administrative costs of applying, the costs of contacting the administration when there are problems with the application procedure and so on. Since farmers enter agri-environmental contracts voluntarily, real negotiation between the parties on

the contract terms is not applicable here. From the public side, these costs are related to the support and administration of the ongoing program; contracting costs, which may include additional information costs, bargaining costs, and decision costs, which are relevant when a market has been set up for pollutants or natural resources.

Monitoring and enforcement costs: Monitoring and enforcement costs occur ex post to the transaction and includes costs the farmer incurs as a result of monitoring and enforcement activities required by the government. Farmer can be obliged e.g. to keep fertiliser application records, to accompany the control agency to their fields when soil samples need to be taken, to count bird nests or to do other administrative tasks in order to prove they have performed their contractual obligations. From the public side, these costs are related to monitoring and detection of non-compliance, which may include both the monitoring of the environmental outcome, or the level of compliance with the regulation, the tax or subsidy scheme, or private contract, as well as the development of monitoring technologies; and prosecution or conflict resolution costs incurred if lack of compliance is found.

TC borne by intermediaries may qualify as public or private TC, depending on whether the intermediary is a collective or private advisors, or a public entity. Intermediaries' costs are incurred for mediation, facilitation, advising, planning, organising meetings, contributions to the formulation and coordination of measures.

The diversity of approaches in empirical studies suggests a lack of consensus on how best to measure TC. It is common to capture TC through proxies. Duration and time involved in tasks related to agri-environment schemes are used as proxy for measuring TC because the monetary value of TC is difficult to measure in a survey (Mettepenningen et al., 2009). Understanding stakeholders' perceptions of TC helps explain why land managers engage with some contracts but not others. As noted by Buckely and Chapman (1997) it is often the perception of TC rather than the real TC that determines a farmer's decision to sign up to an agri-environmental contract. A study in France by Dupraz and Ducos (2007) suggests that TCs associated with AES are fixed costs which explains why farmers with larger farms are more likely to enrol in AES. Our premise is that contract parties, in particular farmers, are required to engage in many activities that are usually overlooked or taken for granted, before they enter a contract as well as during implementation of a contract. These activities have an economic value, and taking them into account can explain the economic effects of agri-environmental contracts more holistically. Making costs associated with contracts visible can highlight areas for improvement, similar to Mettepenningen et al. (2009) who compared the level of private TC to other scheme-related costs and the compensation payment.

### **Application in CONTRACTS 2.0**

For Contracts2.0, the decision was taken to use both qualitative and quantitative methodologies to identify the TC perceived by a) private and b) public actors as the most significant TC for the different types of AES under study, as well as the activities perceived as most limiting, time consuming and expensive at the three different levels of TC related to AES. Additionally, the analysis will also explore the determinants of these perceptions (Figure 9).

Key informant interviews regarding public TC in order to obtain insights about the role of TC in a specific type of contract and about the distributional effects of TC among the contract parties will be followed by semi-structured interviews with CIL and PIL members regarding their perceptions of TC

and factors influencing these perceptions. The interviews will focus on search costs, negotiation costs and monitoring costs related to agri-environmental schemes.

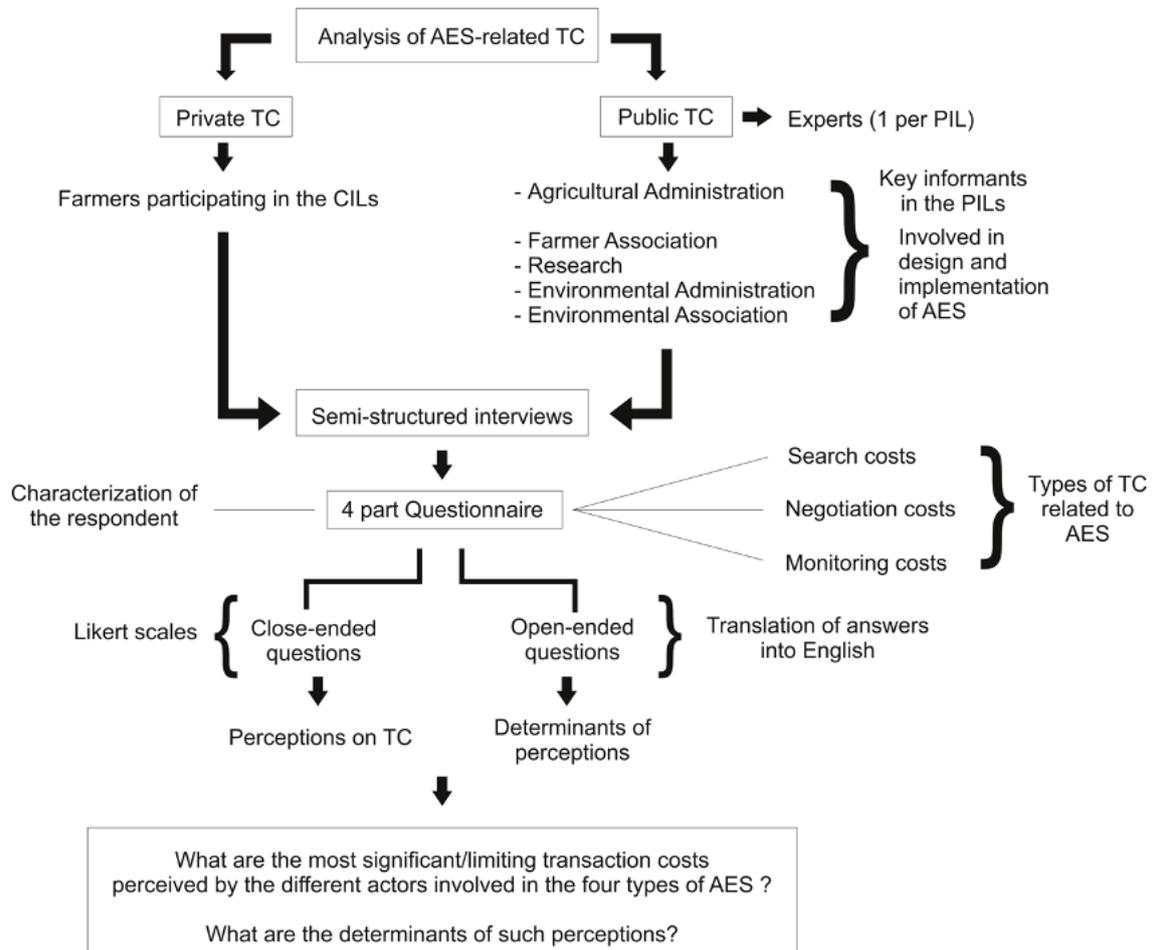


Figure 9: How transaction costs will be captured in Contracts2.0

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## CONCLUSIONS

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This conceptual framework sets out the key concepts we use to investigate agri-environmental contracts in Contracts2.0, in order to develop novel contract-based approaches to incentivise farmers for the increased provision of environmental public goods alongside private goods. We brought together current thinking on 1) Environmental public goods and ecosystem services, 2) Payments for Ecosystem Services, 3) Land tenure and property rights, 4) Collaboration and collective governance, 5) Institutional analysis and 6) Transaction costs. These six concepts around our core topic of agri-environmental contracts showed complementarity and overlap, but also highlighted the different use of terminology in different fields. There are particular synergies between the payments for ecosystem services strand and the (collaborative) agri-environmental management strand. We also found that transaction costs, policy analysis, land tenure and property rights sit comfortably in an institutional analysis framework. The exchange of ideas and the conceptual understanding of the research challenge will be ongoing, but this conceptual framework represents the reference point that the team can use to refine the analysis and interpretation of results.

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