

CONSOLE

CONtract Solutions for Effective and lasting delivery of agri-environmental-climate public goods by EU agriculture and forestry

Research and Innovation action: H2020 - GA 817949

D1.7-Final AECPG contractual framework and practical solutions catalogue

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Project Consortium

N°	Participant organisation name	Country
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2	REGIONE EMILIA ROMAGNA	IT
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4	UNIVERSITAET FUER BODENKULTUR WIEN	AT
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Contents

1	Summary	6
2	Introduction.....	6
2.1	Objective	6
2.2	Potential use of the document	8
2.3	Outline of the document	9
3	Framework	9
4	Main sources of information	11
4.1	Case studies.....	11
4.2	Feasibility of new contract solutions for practitioners.....	13
5	Model Contracts	14
5.1	Model contracts and their features.....	17
6	Design guide: list of potential parameters and options	24
6.1	Actors/parties involved.....	24
6.2	Payment characteristic	30
6.3	Object of contract solution: AECPG type and others.....	35
6.4	Contract length.....	38
6.5	Monitoring & Enforcement	41
6.6	Sanctions.....	46
6.7	Flexibility	46
6.8	Information as a part of the scheme/contract	48
6.9	Eligibility/ Conditions for participation	50
7	Design guide - decision trees for innovative contract types	52
7.1	Choice of contract solution	52
7.2	Result-based contracts	54
7.3	Collective contracts.....	55
7.4	Value chain contracts	56
7.5	Land tenure contracts	57
8	Discussion, Conclusion, and the next steps.....	58
8.1	Discussions and next steps.....	58
8.2	Conclusions.....	58
9	Appendix.....	59
9.1	Glossary	59
10	References	62
11	Acknowledgment	63

List of figures

Fig 1: Outline of CONSOLE work packages.....	7
Fig 2 General framework for contract design.....	10
Fig 3 Case study analysis.....	11
Fig 4 Potential combinations of selected contract features	14
Fig 5 Decision tree for contract type	53
Fig 6 Decision tree for designing result-based contracts	54
Fig 7 Decision tree for designing collective contracts	55
Fig 8 Decision tree for designing value chain contracts	56
Fig 9 Decision tree for designing land tenure contracts	57

List of tables

Table 1: List of case studies in CONSOLE	12
Table 2 Model contracts and their features.....	18
Table 3 List of actors involved.....	25
Table 4 Payment types and characteristics	31
Table 5 AECPPG types and characteristics.....	36
Table 6 Contract length characterization.....	39
Table 7 Monitoring types and characteristics	42
Table 8 Types of sanctions	46
Table 9 Flexibility types in contracts	47
Table 10 Availability of advice and information in contracts.....	49
Table 11 List of conditions for participation.....	50

1 Summary

Document D1.7 – Final AECPG contractual framework and practical solutions catalogue - is an integrated and comprehensive report that defines and illustrates the contract characteristics of the four innovative contract solutions studied by the CONSOLE project and their various hybrids. The framework presents and analyzes the individual components of result-based, collective, value-chain, and land tenure contracts and their combinations. It provides model contracts and decision trees for decision makers and practitioners tested through stakeholder workshops across different EU countries in the framework of the project's Community of Practice in WP5. The framework also defines and describes each attribute by listing and explaining the main potential parameters and options that each contractual solution can have. The data presented here has been backed up by case study analysis, survey results, modeling activities, and stakeholder testing. The framework represents a practical summary of input from all WPs of CONSOLE. The interactive decision trees illustrated here aim to aid practitioners in choosing the appropriate contractual solution for their desired agri-environmental objectives. The framework has also been developed graphically, particularly the design guide (published as 'Design Guide – Annex to D1.7'), and in an easily accessible format (web-based, available at www.console-hub.eu). The analytical approach presented in the framework also helps in the identification of parts or components of the different contracts that act as "weak links" and the potential to combine different contract typologies. That approach facilitates the development of customized contractual solutions appropriate for each context.

2 Introduction

2.1 Objective

This document reports on the Final framework for the provision of AECPGs developed in the CONSOLE project. The report illustrates the characteristics and final contents of the framework, including the complete comprehensive solutions to make it usable in a decision-making context through interactive illustrations and user-friendly online implementation.

It is the outcome of Task 1.4 of the project, which is described as follows:

Task 1.4 Development of final AECPG contractual framework and practical solutions catalogue

Leader: UNIBO; **Co-Leader:** ASAJA.

Contributors: RER, BOKU, ECORYS, ELO, IAE, TI, EVENOR, UPM, LUKE, AREFL, TRAME, CNRS, INRA, UCC, UNIP, ZSA, VUA, SGGW, UoL, UNIFE

Based on task 1.3 and benefiting from the inputs from task 5.2 and task 4.6, the framework and catalogue developed in task 1.3 and reported in the deliverable D1.4 has been refined and produced as the final version in this deliverable. This document includes upscaling and cross-scale considerations of contractual

solutions to make the framework usable by a wide range of end-users and actors. The framework offers various contractual attributes that contract designers can choose from and feed into the interactive decision trees to get the right contractual solution for their specific agri-environmental objectives. The framework has also been developed graphically, particularly the design guide (published as 'Annex to D1.7'), and as an easily accessible format (web-based, developed in WP6).

This document is part of CONSOLE's WP1, which focuses on developing the AECPG contractual framework, including model contracts, which is at the project's core, through a deep involvement of the relevant Community of Practice (discussed in WP5). WP1 aimed to produce a consolidated report wherein the inputs from other WPs have been incorporated through co-constructed knowledge accumulation and operationalization, as seen below (Fig 1).

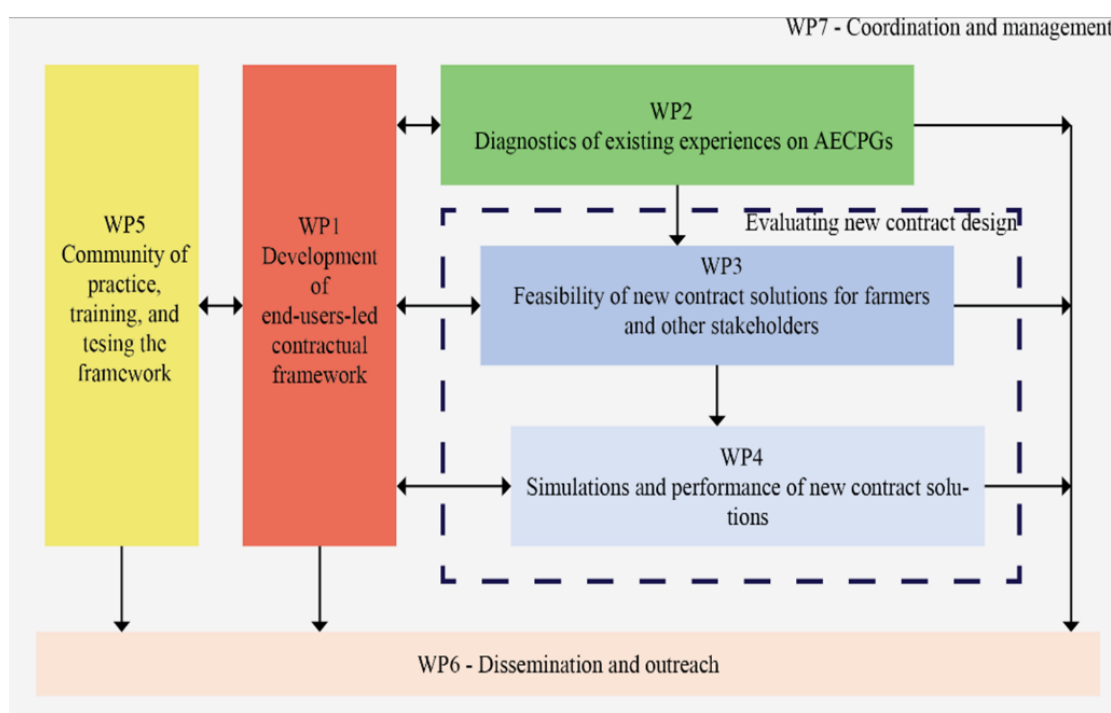


Fig 1: Outline of CONSOLE work packages

This document is an improved version of Deliverable D1.3, which aims to build a draft conceptual framework for the project. The draft framework was tested by the stakeholders and other actors involved in the CoP as part of CONSOLE's Task 5.2 and reported in D5.5. This document is the result of the outcome of the testing. The contractual solutions, the model contracts, and the decision trees have been upgraded to reflect stakeholder suggestions to make them more robust and consistent with the perception of real-life decision-making needs. Further insights from other parts of the project developed during the period have been included.

The framework is open to be further developed and refined through future studies.

The outputs of the framework are showcased and made available on-line in a web-based and more interactive format so that a broader range of users and practitioners can interact with them. The web version, called CONSOLE HUB, is available at the address: www.console-hub.eu.

This final version of the framework includes the following:

- a) A **Catalogue** showcasing existing successful experiences and good practices in AECPGs contracting based on the case studies developed in WP2 and presented in a usable form as examples for practitioners, including points for replication.
- b) **Improved contract solutions** that can be used as models for future design, including delivering multiple AECPGs, contractual design and assessment, and the role of different levels of governance (from local to EU) for efficient implementation.
- c) A “**Design Guide**” intended as a systematic, comprehensive process for designing AECPG contracts, including the conceptual framework, design variables, determinants, legal and technological aspects, and roles of different governance levels in implementation.
- d) Documentation, training, and supporting **materials**
- e) Link to related **websites** and information sources

2.2 Potential use of the document

This document derives from WP1, 2, 3, and 4, wherein the newly designed contract solutions were defined through intensive evaluation of EU-wide case studies compiled as factsheets and evaluated based on the acceptance of farmers, foresters and other stakeholders and through modeling and simulation. This document aims to serve as a guide for related actors using the framework in real-life decision-making contexts. The framework also seeks to provide a strong evidence basis for showcasing well-documented solutions to be disseminated for delivering real-life impact and supporting policies.

The document can be used in different ways:

- To choose among potential new contract solutions as alternatives to or combinations with today's dominating practices, in particular, action-based approaches;
- To design contract solutions from the preparatory phase up to contract conclusion and measure implementation;
- To consider adding customized prescriptions for practitioners to use;
- As a checklist to support practitioners in understanding whether one or more of the four contract types is appropriate in a given context;
- It will also contribute to identifying data needs and data management issues for implementing the developed approaches.

2.3 Outline of the document

The document is arranged as follows: Sections 3 and 4 describe the previously achieved deliverables that will assist in designing this framework. Specifically, section 3 describes the framework and links to individual factsheets, and section 4 describes the case studies and the steps ahead for the survey results conducted with farmers, forest owners, and other stakeholders to test the feasibility of new contract solutions. Section 5 describes model contracts and their characteristics. We discussed the potential classification of contract types based on several features (shown in Fig 2). Sections 5 and 6 are the core of the framework, i.e., the design guide, which is intended as a systematic, comprehensive process for the design of AECPG contracts, including the conceptual framework, design variables, determinants, legal and technological aspects, and roles of different governance levels in implementation. Section 7 illustrates the framework via decision trees for the utilization of contractual solutions. This document concludes with Section 8, Discussion & Conclusion, which outlines this report's take-home message and highlights the next steps. Additional information is attached as Appendix.

3 Framework

The framework intends to study how the contract solutions available for AECPG provision interact with the context and produce effects. The framework is cyclical and highlights the causal chain from factors behind contract design to its impact and then leads to the next round of contract design. On the left-hand side, the loop starts with 'system features' (related to agriculture, food, and forestry systems (or, more widely, bioeconomy systems), determining processes that allow and shape the definition of contract solutions. In turn, contract solutions lead to the 'mechanisms of impact' on the systems, which may be described through human or environmental/ecosystem behaviour processes. The overall effect can be measured through environmental/ecosystem improvements over time and can be related to contract features and their performances. Hence, contract performance connects the other dimensions and can be used to assess different contract solutions.

We modified the draft framework we had proposed in D1.1 and D1.4 by ensuring that we closed the loop between impacts and features. We changed the specific features in the new framework to indicate how the feature relates to the contract type, as given below (Fig 2):

1. **Environmental Objective as a Reference parameter for payment – (result-based contract solutions):** Result-based contracts connect payments to environmental effects or the amount of AECPGs provided (environmental outcomes and benefits). In result-oriented agreements, the payment may depend on a simplified measurement based on models or a point system linking a set of practices to expected outcomes. In the latter, the difference between result-based and action-based is more blurred.

2. **Cooperation among farmers/actors (collective contract solutions):** In a broad sense, collective contracts include agreements between groups of farmers/foresters/landowners and/or other actors to apply for an AECS agri-environmental scheme collectively. The cooperation can involve different degrees of collaboration, establish a formal entity, etc. The payment for the activities undertaken to meet environmental objectives and enhance AECPGs is then made to the group in some cases and then shared with individual farmers. However, different forms are possible; for instance, payments for individual farmers can also adhere to a collective.
3. **Tenure-related environmental prescriptions (land tenure contract solutions):** Tenure-related environmental prescriptions under the CONSOLE Project refer to those land leases or land contracts that include an environmental dimension (e.g., the land tenure contract comes along with rent associated with environmental prescriptions).
4. **Connection with private goods provision (value-chain contracts):** Public goods are produced through targeted prescriptions included in contracts for producing agricultural/forestry goods. It implies that consumers have clear information about the product's connection with the public good and, therefore, (usually) accept to pay (more) for that added value.

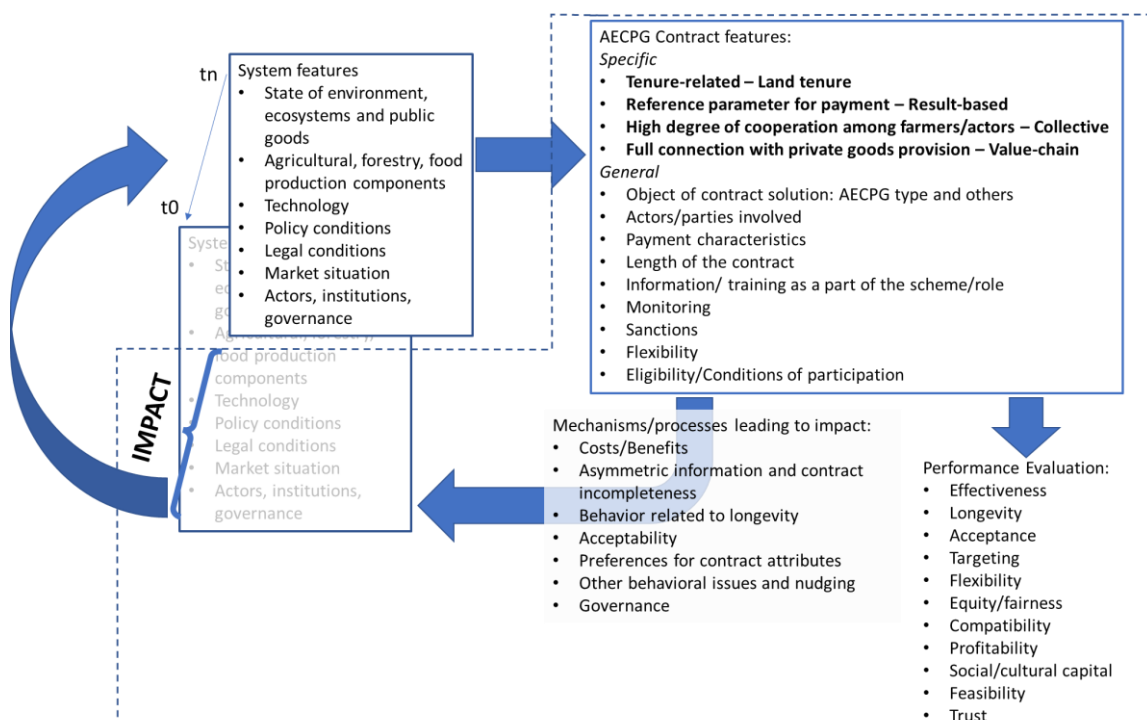


Fig 2 General framework for contract design

4 Main sources of information

4.1 Case studies

The case studies referenced below are reported here for ease of access (Table 1).

A catalogue of case studies has been collected across the EU, especially from the partner countries, and scanned to identify approaches that match the contract features targeted in the CONSOLE conceptual framework (Fig 2 above). These case studies highlight potential options/ initiatives that can help overcome weaknesses and/or hurdles for implementing the innovative contract types. Accordingly, four main categories were identified. Each case study had four major points: **case study description, data/facts of the contract, context information, and reasons for success**, as shown below (Fig 3). These common points made the case studies uniform to read and easy to analyze.

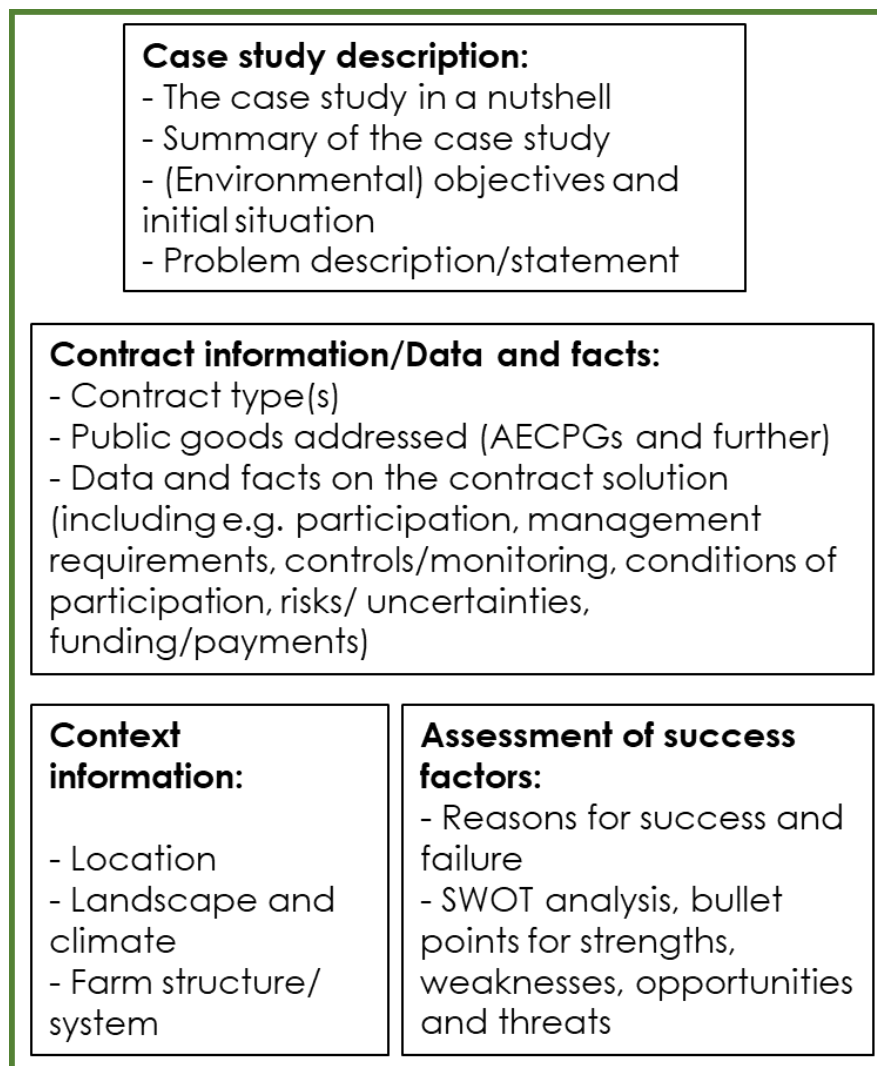


Fig 3 Case study analysis

The case studies have been reported and analyzed in-depth in [D2.1](#), [D2.2](#), [D2.3](#), and [D2.4](#). They are also available on the project hub as individual factsheets for public information (link: <https://www.console-hub.eu/>). The case studies highlighted the different contract types; some included hybrid solutions, as seen in Table 1 below.

Table 1: List of case studies in CONSOLE

COUNTRY	TITLE	CONTRACT TYPES			
		RB	CO	VC	LT
AT	Biodiversity monitoring with farmers	X			
AT	Result-based Nature Conservation Plan	X			
AT	The Humus Program of the Ökoregion Kaindorf (Carbon market)	X			
FI	Nature value bargaining (Luonnonarvokauppa)	X			
FR	ECO-METHANE – Rewarding dairy farmers for low GHG emissions in France	X			
IRL	RBAPS - The Results-based Agri-Environment Payment Scheme (RBAPS) Pilot in Ireland	X			
IT	Farmers as Custodian of a Territory	X			
LV	Bauska Nature Park tidy up of territory	X			
NL	Biodiversity monitor for dairy farming	X		X	X
NL	Biodiversity monitor for ARABLE farming	X		X	X
FR	Terres de Sources - Public food order in Brittany, France	X		X	
DE	Organic farming for biodiversity	X		X	
BE	Participation of private landowners to the ecological restoration of the Pond area Midden-Limburg/ the 3watEr project	X	X		
BE	Wildlife Estates Label in Flanders	X	X		
BE	Flemish nature management plan	X	X		
DE	Viticulture on steep slopes creates diversity in the Moselle valley	X	X		
DE	Agro-ecological transition pathways in arable farming	X	X		
FR	HAMSTER – Collective AEEM to restore habitats of the European Hamster in Alsace (France)	X	X		
IRL	BurrenLife Project	X	X		
IRL	BRIDE - Biodiversity Regeneration in a Dairying Environment	X	X		
FI	Protected areas of private forests as tourism destination	X	X		X
BE	FLANDERS– Flemish Forest Group		X		
DE	Forest conversion from coniferous to deciduous stands – an eco-account case		X		
IT	Incentives for collective reservoirs		X		
IT	Cooperation in Natura 2000 area benefiting biodiversity		X		
IT	Integrated territorial projects		X		
UK	Delivering multiple environmental benefits in the South Pennines		X		
UK	Using natural flood management to achieve multiple environmental benefits in Wharfedale		X		
UK	Building natural flood management knowledge and capacity in Wensleydale		X		

UK	Natural Flood Management in the River Swale catchment in Yorkshire		X		
UK	Environmental improvement across a whole catchment: Esk Valley		X		
NL	Kromme Rijn Collective management		X		
LV	NUTRINFLOW		X		
LV	Forest Management		X		
PL	Natural grazing in Podkarpackie Region		X		X
PL	Program "Sheep Plus"		X		X
FI	Forest Bank – a forest conservation program in Indiana and Virginia, US		X		X
FI	Green jointly owned forest - TUOHI		X	X	X
NL	Green Deal Dutch Soy		X	X	
AT	ALMO – alpine oxen meat from Austria			X	
BG	Organic honey from Stara Planina mountain sites			X	
BG	"The Wild Farm" organic farmers			X	
FR	Esprit Parc National - Food and services in the national park of Guadeloupe			X	
PL	Program "Flowering meadows"			X	
PL	Bio-Babalscy – Organic Pasta Chain Preserving Old Varieties of Cereals			X	
DE	Water protection bread (Wasserschutzbrot)			X	
IT	"Carta del Mulino" – Barilla			X	
ES	Cooperative rice production in coastal wetlands in Southern Spain			X	
ES	Organic wine in Rueda, Spain (Rueda)			X	
ES	Integrated production in the olive groves			X	
FI	Carbon Market (Hiilipörssi) – a marketplace for the restoration of ditched peatlands		X	X	
BG	Conservation of grasslands and meadows of high natural value through support for local livelihoods				X
BG	Conservation and restoration of grasslands in Strandzha and Sakra mountains for restoring local biodiversity and endangered bird species				X
DE	Collaboration for sustainability between institutional landowners and tenant farmers				X
FI	Pasture bank - a platform for pasture leasing				X
FR	Eco-grazing - Grazing for ecological grasslands maintenance in the green areas of Brest Metropole				X
IT	Rewilding of detention basin in Massa Lombarda				X
LV	DVIETE LIFE				X

4.2 Feasibility of new contract solutions for practitioners

The project's work package 3 (WP3) focused on assessing the feasibility, including acceptability and implementability, of the innovative contract solutions through surveys involving a wide range of farmers, rural landowners, and other key stakeholders in the 12 participating EU Member States and the UK.

Acceptability, preferences, technical constraints, and economic perception, as well as likely behavior (and its drivers) by farmers, forest owners, and other actors potentially involved in innovative AECPGs contracts, are being investigated through a collection of secondary data (T3.1) and surveys aligned/coordinated across the project partner countries (T3.2 and T3.3). The results of these activities are being further evaluated, validated, and synthesized through a series of local workshops (T3.4). Final results have been used as inputs in this document; thus, this will be our final framework.

5 Model Contracts

We term “Model contracts” the combinations of features that can be considered a prototype (model) for each contract type based on the most frequent varieties of design features observed in practice. The most frequent qualifying features for the contract types above are illustrated in the figure below (Fig 4).

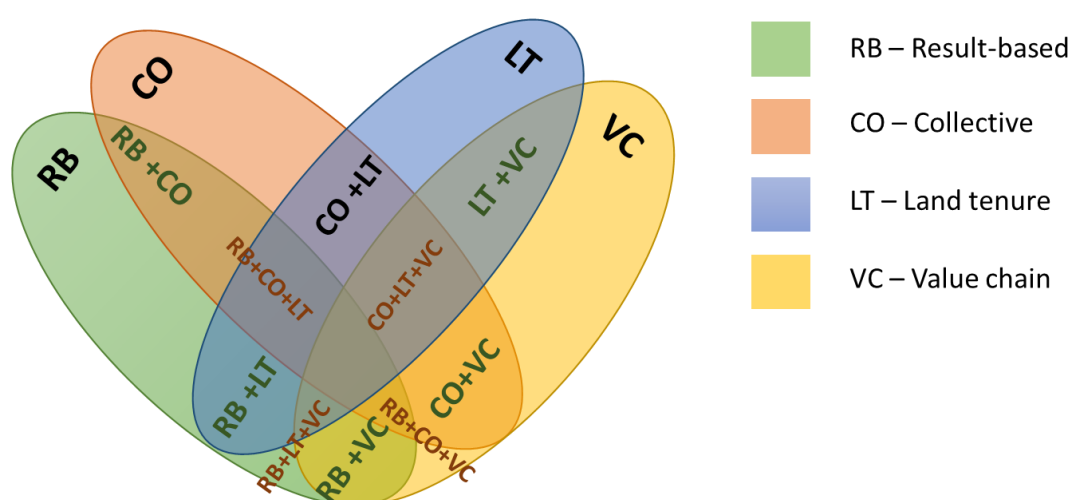


Fig 4 Potential combinations of selected contract features

When one of the four features above is prevailing, four corresponding types may be identified: result-based contracts, collective contracts, value-chain contracts, and land tenure contracts. However, frequently occurring combinations can be identified, which may be labeled as “hybrid types.” (See D2.3 and D2.4 - case study analysis for more details). Some combinations are particularly interesting, for example, hybrid forms with some result-based and some collective elements. However, the most suitable mix can only be evaluated depending on local needs. In D1.1, we identified specific features characterizing selected AECPG contract typologies, these being:

1. Result-based contracts (RB)

Result-based contract solutions are based on contracts specifying a result rather than implementing management measures (e.g., the delivery of a specific AECPG is subject to the contract and serves as a reference parameter for payment). Farmers receive a payment only for delivering environmental or

climate action results. Farmers are free to decide about management practices. A distinction is made between result-based and result-oriented contract solutions. In result-based contract solutions, farmers or management bodies are paid if they achieve certain precisely defined ecosystem/environmental objectives. In result-oriented measures, it is sufficient if a certain form of result orientation is included. Still, the payment level does not directly relate to the visible improvement of an environmental objective, or the result itself is not necessarily the basis for the payment. Nonetheless, the lines are blurred, and a clear demarcation is difficult. We put our framework's result-oriented and result-based contract features under the result-based category.

2. Collective contracts (CO)

In contractual solutions based on collective implementation and/or cooperation, farmers and/or private/public landowners voluntarily enter a joint, collective partnership to commonly deliver a specific environmental or climate action goal. That means that farmers, foresters (and other stakeholders) cooperate (by establishing an entity with or without legal personality) to achieve a specific (AECPG) target. Contract solutions putting forward collective implementation or cooperative/collaborative elements often address a territorial/landscape level of AECPG provision and mainly target a broader bundle of AECPGs. From the CONSOLE case studies, it is evident that such solutions are primarily applied to AECPGs being delivered "across field borders," meaning AECPGs which can hardly be improved by measures on singular fields and plots (e.g., water quality, maintenance of habitats). In general, collective and cooperative/collaborative approaches can be used to address problems that cannot be solved individually or to achieve specific environmental improvements that can better be reached by working together.

Collective contracts can be executed with varying degrees of rigor. Very narrowly defined, collective contracts mean that a group of landowners/farmers/foresters join by establishing a formal entity and commonly apply for an AES. The payment for the activities to enhance AECPGs is then made to the group and not the individual farmer. However, many successful contractual solutions collected under CONSOLE contain strong elements of collaboration and cooperation while not fulfilling the aspect of collective payment. In such kinds of cooperative/collaborative contract solutions, individuals work together to achieve a common goal (e.g., creating a specific habitat), while collective payments are not issued.

3. Value chain contracts (VC)

Some contract solutions consider the production of AECPGs in connection with the production of private goods. These solutions are motivated by engaging all the different parts of a value chain, and the environmental benefits provided by the supplying farms are often part of the food companies'/retailers' marketing strategies. The farmers get monetary support through finance from market actors. In such contracts, the producers must meet specific environmental

requirements. For instance, reduced nitrogen use, higher animal welfare standards, preservation of biodiversity, organic farming, etc. Value chain-related contracts for the producers might lead to sale guarantees, price premiums, and/or the use and marketing of products under specific brands. Moreover, some value chain-related contractual solutions provide an example of a way of better supporting and marketing organic production.

4. Land-tenure contracts (LT)

Land tenure contracts feature clauses for the improvement or conservation of environmental assets. Farmers enter into land tenure contracts where they pay particular attention to environmental aspects beyond legal requirements when producing on leased land. Landowners (private or public) lease their land to farmers, foresters, or third parties under certain conditions. These conditions serve to achieve some form of ecological or environmental improvement. The landowner accepts a lower lease payment to compensate for farmers' additional environmental or climate action efforts.

5. Hybrid contract types

Hybrid contract types are an intersection of different contractual solutions. They are usually characterized by one contract type with additional characteristics of other contract types.

Literature supports that hybrid approaches are helpful tools for reducing risks to farmers, increasing collaborative approaches, and supplying many public goods (Cullen et al., 2018; Derissen & Quaas, 2013a, etc.). Though most of the hybrid solutions tested through studies are result-based payments with collective or value-chain approaches (like in Life+ and RBAPS projects), CONSOLE provides an array of hybrid approaches with real-life examples that can be studied further and tested in the field. While Fig 4 shows all possible overlaps of the four innovative contract solutions, some of them are more likely than others, as evidenced in the CONSOLE case studies.

WP2 and WP3 indicated that innovative typologies often occur as hybrid contracts. These hybrids are explained in D2.3 and D2.4 (case study analysis) and D2.7. In particular, the most common form of hybrid concerns result-based and collective contracts. For example, the BurrenLife Programme (IRL1) is a hybrid case, combining result-based and collective approaches, whereby participating farmers are rewarded annually for their environmental performance (RB) while also having access to a common fund to carry out self-nominated 'conservation support actions' (CO) to help improve this performance over time. Support from the literature and previous project deliverables have been used to define the hybrid contracts in detail below. Another interesting form of RB+CO hybrid is the joint-liability contract featuring a collective uptaking of payment for results. The innovative part lies in measuring the result performed on a sample of the collective (not in each farm) and

therefore facilitates the monitoring. Quite interesting, that hybrid form also allows for economies of scale (a bigger collective allows lower monitoring costs).

The sub-section below describes all contract features of the innovative contractual types, including hybrid types.

5.1 Model contracts and their features

We term “Model contracts” the combinations of features that can be considered a prototype (model) for each contract type based on the most frequent combinations of design features observed in practice. The most frequent qualifying features for the contract types above are illustrated in the table below (Table 2) for each contract type and their “hybrids” (definitions and details of all contract types and hybrids are available in D1.4, section 4).

Table 2 Model contracts and their features

Contract type	AECPG Type	Actors involved	Payment type and characteristics	Length of contract and renewal	Information, advisory, or training in scheme	Funding	Monitoring	Sanctions	Flexibility	Conditions of participation
Result-based	<ul style="list-style-type: none"> - Biodiversity - Climate regulation - Water security 	<ul style="list-style-type: none"> - Farmers/ forest-owners - Non-profit organisations - Private companies and market players - Government bodies - Research project teams - Ecologists/ researchers - Consumers - Banks - Shareholders 	<ul style="list-style-type: none"> - Non-tradable emission certifications - Incentive payments (like vouchers, one-time bonuses, etc.) - Payment for label or brand - Payment for product - Combination of incentive payment and product price 	<p>Mostly long-term; can be medium- and short-term too.</p> <p>Renewal is possible</p>	Advice & training are given for free by public bodies, private experts, NGOs, etc.	Public funding (incl. from international bodies) + private funding	<ul style="list-style-type: none"> - Monitoring of selected indicators by public bodies or private bodies hired by the financing bodies - Well-trained staff are needed to carry out the controls and monitoring of compliance and the measurement of results 	<ul style="list-style-type: none"> - Compliance is crucial for successful implementation of the contract and fair payments - non-compliance can lead to termination of contract or reduction of payments 	High degree of flexibility in choosing management practices, contract duration, and contract areas. However, objectives need to be met	<ul style="list-style-type: none"> - Some RB approaches do not allow farmers to participate in other AES (to avoid double funding) - Farmers have to achieve the environmental objectives of the contract

Collective	<ul style="list-style-type: none"> - Water-related AECPGs (quantity and quality) - Resilience to natural hazards - Specific habitats 	<ul style="list-style-type: none"> - Farmers and landowners association - Community organizations - Government bodies (center/state/municipalities) - Private associations (like forest groups) - Private companies and market players 	<ul style="list-style-type: none"> - Compensation payments: paid by the rate per area, length, or quantity - Incentive payments - Payment for product 	Short- or long-term contracts. Renewal is possible for longer periods	<ul style="list-style-type: none"> - Advisory is always available within collectives or cooperatives. - Helps build trust among the actors involved 	Public funding (incl. from international bodies) also can be private funding	The government or private experts monitor nature management contracts. Some collective agreements have no monitoring	<ul style="list-style-type: none"> - Varied degrees of compliance - one of the stakeholders is responsible for monitoring and ensuring compliance - non-compliance can lead to termination of the contract 	High flexibility to collectives unless it is a hybrid. In that case, flexibility can decrease.	<ul style="list-style-type: none"> - A minimum number of farmers need to participate
Value Chain	Environmental benefits alongside with quality and security of products	<ul style="list-style-type: none"> - Private companies and market players - citizens or consumers - Non-profit organizations - Animal welfare associations 	<ul style="list-style-type: none"> - Payment for Label or Brand - payment for product - online donations - Combination of incentive payment and product price 	<ul style="list-style-type: none"> - Mostly long-term contracts between farmers and processors. - They can be profitable but risky. - Renewal is possible after the evaluation 	Training and advisory are provided for free by private actors. Monitoring bodies also provide advisory	Private funding	<ul style="list-style-type: none"> - Strict monitoring of quality of products - Monitoring done either by processors themselves or private bodies hired by the market actors. The hired bodies can include 	<ul style="list-style-type: none"> - non-compliance can lead to prohibition of the brand use 	<ul style="list-style-type: none"> - Higher flexibility of contract rules - Low flexibility for management practices and environmental objectives set for the 	<ul style="list-style-type: none"> - Limitations for using brand name or labeling - Some VC contracts exclusively for farmers with organic certification

							certification organizations, non-profits, or private experts.		contract and for the quality of the product to be delivered - Farmers can enter multiple AES	
Land-tenure	<ul style="list-style-type: none"> - Biodiversity & habitats - Landscape & scenery 	<ul style="list-style-type: none"> - Non-profits and NGOs, private organizations - Government bodies - Landowner association - Private companies and market bodies 	<ul style="list-style-type: none"> - Compensation payment is usually in the form of lease reduction: paid by the rate per area, length, or quantity - Land lease 	<ul style="list-style-type: none"> - Medium- to long-term contracts. - Contracts can be long-term if hybrid (like collective and result-based approaches). - Contracts can be fixed. - Renewal is only allowed after long-term or no renewal in some cases. 	Training and advisory by land managers, project stakeholders, etc.	Private funding, rarely public funding (for communal land)	No controls or only self-monitoring by landowners. Only nature management plans are monitored by either private experts or NGOs and non-profits.	Non-compliance can lead to non-renewal	High flexibility in choosing management practices and no strict conditions for participation	<ul style="list-style-type: none"> - Some LT contracts require farmers to participate for a fixed duration (usually long periods) - Early termination is legally difficult

HYBRID CONTRACTS										
Hybrid contract type	AECPG Type	Actors involved	Payment type	Length of contract and renewal	Information, advisory, or training in scheme	Funding	Monitoring	Sanctions	Flexibility	Conditions of participation
Value chain + result-based or result-oriented VC + RB E.g., FR2, DE2	<ul style="list-style-type: none"> - Biodiversity - Landscape & scenery - Product quality 	<ul style="list-style-type: none"> - Local government - Local businesses - Farmers/landowners 	Incentive + product price	Usually short contract duration (1 – 5 years)	Advice and training are freely available, or farmers may get money for training and consultation	Private funding	Strict monitoring using indicators	Suspension or termination of the contract on non-compliance	Farmers can choose their farm management conditions	<ul style="list-style-type: none"> - Contracting parties can determine their conditions and measures - High product quality is an important condition
Collective + result-based CO + RB E.g., FR5, IRL1, IRL3	<ul style="list-style-type: none"> - Biodiversity - Recreational access - Cultural heritage - Landscape & scenery - Soil quality - Water quality 	<ul style="list-style-type: none"> - Public bodies - Government - Farmers 	<ul style="list-style-type: none"> - Incentive - Fee for label - Subsidies 	It can be medium or long (5 years or more)	Advisory is available through stakeholders of the collective or hired farm advisors	Public or Private funding	<ul style="list-style-type: none"> - Monitoring by financing bodies (govt.) or by contracted farm advisors - Self-monitoring by stakeholders and farmers 	Non-payment for non-compliance	Farmers cannot enter other contracts	<ul style="list-style-type: none"> - All stakeholders must agree to the contract conditions - There should be a consensus among farmers over measures

<p>Collective + Land tenure CO + LT E.g., PL1, PL2</p>	<ul style="list-style-type: none"> - Biodiversity - Landscape & scenery - Cultural heritage - Animal health & welfare 	<ul style="list-style-type: none"> - Govt/ public bodies - Farmer associations - Landowners & landowner associations - NGOs and non-profits - Private associations (like Life+ partners) 	<ul style="list-style-type: none"> - Incentive - Land lease 	<ul style="list-style-type: none"> - Short-term (1 season, 1 year, etc.) 	<p>Contracted NGOs and non-profits provide training</p>	<p>Public or Private funding</p>	<p>Partial monitoring by external actors or self-monitoring by collectives</p>	<p>Non-compliance can lead to termination or non-renewal</p>	<p>High flexibility for choosing management practices</p>	<p>- The area of the contract is pre-determined by the financing parties</p>
<p>Land tenure + value-chain LT + VC E.g., FI1, FI5</p>	<ul style="list-style-type: none"> - Landscape & scenery - Soil quality - Climate regulation (carbon storage) 	<ul style="list-style-type: none"> - Market actors - Forest owners - Local municipalities - Shareholders 	<ul style="list-style-type: none"> - Tradable emission certificates - Price for forest resources (like timber harvests) - Carbon credits 	<ul style="list-style-type: none"> - Fixed or permanent (e.g., FI5 is a permanent contract for 99 years) - withdrawal is possible 	<p>Provided for free by private actors</p>	<p>Private funding</p>	<ul style="list-style-type: none"> - Annual third-party audits - internal monitoring by stakeholders 	<p>Non-compliance can lead to non-renewal and termination of brand use</p>	<p>Flexibility to choose management practices</p>	<p>- Farmers/ foresters entering the contract should already have some certificate or some "green" label for their forests</p>
<p>Value chain + collective VC + CO E.g., FI3</p>	<ul style="list-style-type: none"> - Climate regulation (carbon storage) - Biodiversity - Water quality 	<ul style="list-style-type: none"> - Farmers, farmer associations, landowners, landowner associations - Carbon market 	<ul style="list-style-type: none"> - Donations - Investments 	<p>Permanent</p>	<p>Provided for free by private actors or by farmers or landowners or cooperatives</p>	<p>Private funding</p>	<p>Self-monitoring</p>	<p>Non-compliance can lead to prohibition of brand use or suspension of contract</p>	<p>Low flexibility in terms of product quality</p>	<p>Farmers and landowners should collectively agree to contract measures</p>

		- Investors/ donors								
Result- based + land tenure + collectiv e RB + LT +CO E.g., FI2	- Landscape & scenery - Recreational access - Rural viability & vitality	- Private forest owners - Private nature-based tourism enterprise	- Profits from tourism (product price, product being tourism)	Flexible	Free training and advisory can be provided by stakeholder s or arranged among the cooperativ es	Public (including internatio nal bodies) or private funding	No monitoring, contract is based on trust	Non- compliance can lead to the termination of the contract	Flexibility of choosing contract duration and renewal	Farmers, landowners, and forest owners should be aware that only limited resources are available while entering the contracts
Result- based+ Value- chain+ Land tenure RB+VC+ LT NL3, NL4	- Biodiversity - Landscape & scenery - Soil & water quality - Climate regulation (carbon storage + GHG emissions)	- Government - Market sector - NGOs and non-profits	- Product price - Loan interest discounts - Subsidy - Favorable land lease conditions	Usually short contract duration (1 – 5 years). Can be open-ended	Advice and training are freely available, or farmers may get money for training and consultatio n	Public or private funding	Strict monitoring using indicators. - E.g., NL3 uses key performance indicators for monitoring	Suspension or termination of contract on non- compliance	Farmers can choose their farm managem ent conditions	- contracting parties can determine their conditions and measures - high product quality is an essential condition

6 Design guide: list of potential parameters and options

6.1 Actors/parties involved

Actors are the parties involved in a contract and can be classified according to the institution involved. For instance, a typical agri-environmental scheme involves a public institution (payer) and an individual (the farmer receiving the payment). Other forms of contracts where only private parties are involved attract a relevant interest, as in the case of many value-chain contracts. A further issue concerns whether the involved actors are individuals or collectives. That is relevant in collaborative and cooperative forms of contracts (to explain the role of cooperation among farmers/actors). Finally, introducing an intermediary as an additional actor in an agreement seems to be a relevant condition for success, particularly for implementing more verbal forms of contracts. The scale of the contract, e.g., farm level, landscape level, watershed, region, etc., is also significant in connection with the parties involved. Table 3 below lists all the possible actors and parties that can be involved within different types of contracts and AES.

Table 3 List of actors involved

Type of actor/party	Roles	Benefits from involvement	Points of attention	Case study example	Evidence from the survey
Farmers	Farmers are the main actors in AES transactions	Farmers' environmental attitudes often determine the effectiveness of agri-environmental policy. Engaging the farmers in the evaluation process of an AES helps improve the current schemes and gather local opinions on future directions of agri-environmental policy.	AES depend on farmers' acceptance and participation in their implementation	E.g., Many case studies involve individual farmers. Like, the humus program (AT4) started in 2007 with 3 farmers and, by 2020, had 300 farmers involved in the program.	
Farmer Association(s)	Farmer cooperatives are important tool for the survival of rural areas, competing against current trends in business concentration and maintaining social cohesion	1. Individual farmers can be more connected to the market 2. Secure economic viability of small & medium farmers	1. Risk of following hard measures and risk of losing contracts or certification 2. While selling to market players, certification requirements should have been met	E.g., 1. 400 Austrian mountain farmers are a part of the ALMO Association (AT1). They form the farmer's association called ALMO-Verein. 2. 1100 farmers created The Arrozu program for producing and marketing higher quality rice (ES1) 3. 249 farmers are involved in the contract solution to ensure a stable water supply in farms in case IT1	
Landowners' organization(s)	- Enrolling land in a contract - Associating to other stakeholders (public-private-civil society partnerships)	Technical and administrative support	Landowners and landowners' associations usually demand increased compensation in exchange for increased control and monitoring.	E.g., Landowners can enrol their lands in the Wildlife Estate (WE) label across EU like many farms in Flemish region of Belgium (case study BE3). Also, ELO (case study BE4) mediates this association	
Civil society - Non-profit organisation	1.Coordination for funding, selling to private associations, with local municipalities, etc.	1. Direct contact of farmers and consumers 2.Certification provides an incentive	Certification for marketed brands can have higher requirements	E.g., 1. Bleu-Blanc-Coeur in case study FR4 2. Managing humus certification by Ökoregion Kaindorf in AT4	

Type of actor/party	Roles	Benefits from involvement	Points of attention	Case study example	Evidence from the survey
	2. Certification	3. No obligatory requirements for farmers/ flexibility in participation and measures		3. Managing the 'Greifswalder Agrarinitiative' by the Michael Succow foundation (DE3)	
Civil society - non-governmental organisation	1. Monitoring (delegated by the government) 2. Administrative and technical support 3. facilitating collaboration between private and public actors 4. May also provide financial help (through fundraising)	1. Reduces administrative barriers 2. Streamline consultation between all stakeholders 3. May act as intermediaries between farmers and funding organizations to ensure smooth payments	Since measures are monitored based on results, a risk of not reaching the objectives can emerge	E.g.: 1. species monitoring and providing data to governmental websites by Collectief Utrecht Oost in NL1 2. Forest management by the collection of NGOs called De Bosgroepen in BE2 3. Biodiversity conservation by Bulgarian Society for Protection of Birds (BG1) 3. local NGO Burrenbeo Trust is closely aligned with farmers in BurrenLife project (IRL1) 4. NGO Farmers' Parliament (ZSA) financed 10% of the project in case study LV1 5. NGOs raise funds for statutory activities and management of priority areas in case studies PL1 and PL2	
Civil society – Community organizations	- Enhancing cooperation among different actors and farmers/ foresters			E.g., Kuusamo cooperation network enables contracts between private forest owners and tourism entrepreneurs (FI2)	
Civil society - Cooperatives	- Act as a marketing channel for private specialists and companies	- Enhance farmers' intention to participate by facilitating the application of AES and by generating group pressure - Act as the facilitators of collective AES	Development of the contract is dependent on project funding	E.g., 1. ProAgria is a Finnish expert organization that provides an extensive network of specialists and services to rural entrepreneurs (FI4). They also help in other EU-cases (LV1) 2. Agriculture cooperatives are involved in Integrated Territorial Project in Tuscan archipelago contracts (IT6)	
Government (Centre/ state/	1. Goal setting 2. Monitoring 3. Technical training	1. National certification 2. Encourage collective participation	1. Rigid result-based measures and non-compliance can lead	E.g., 1. Kromme Rijn province in NL1 2. Regional Forest Centre monitored the characteristics of protected forests in FI6	

Type of actor/party	Roles	Benefits from involvement	Points of attention	Case study example	Evidence from the survey
municipalities)			to termination of the contract 2. There can be a lack of funding	3. State limited company "Ministry of Agriculture, Real Estate" control and monitor the results of the contract in case study LV1 4. Countryside Stewardship Facilitation Fund (CSFF) Group is a special rural payments agency set up by Forestry Commission, England to environmentally enhance vulnerable areas across the country (like moor restoration, improving biodiversity, managing natural floods, improving water quality across catchments, etc.) (case studies UK1, UK2, UK3, UK4, and UK5)	
Private companies/ Market Players (Buyers, Processors, Retailers, etc.)	1. Private contracts 2. Organizes certificate trading/ buys certificates 3. May monitor the certification requirements 4. Can include carbon markets for funding	Finance the agri-environmental measures through selling product/ buying market shares/ selling carbon	1. Uncertainty in long-term maintenance of the contract 2. Companies might lose interest in certificates 3. Buyers procure organic/ certified products from farmers	E.g., 1. Lidl (Salzburg) buys humus certificates from Ökoregion Kaindorf in AT4; Private contracts are with OVML vzw in BE1 2. the meat processing company 'Schirrhofer' in AT1 3. Distributors of organic honey 'Harmonica' in BG2 3. Bakeries and Mills that acquire wheat from farmers in case study DE5 4. Retailers that acquire high-quality rice in case study ES1 5. Winery 'Herederos del Marqués de Riscal, S.A' buy ecologically produced grapes and produce wine according to two high-valued labels (ES2) 5. The Carbon Market (Hiilipörssi) in FI3 has no payments for the landowner; instead provides money for peatland restoration 6. "Carta del Mulino" program is a value-chain contract by Barilla that buys soft wheat from farmers (IT4 case) 7. Agrifirm, a soy processor, is the key partner in setting up value chains and designing farmer contracts in case study NL2	Getting a sales guarantee from a processor or retailer for implementing environmental measures increases respondents' willingness from all partner countries except for respondents from the Netherlands.

Type of actor/party	Roles	Benefits from involvement	Points of attention	Case study example	Evidence from the survey
				8. Żywiec Zdrój S.A manages and finances the program 'Flowering meadows' in threatened mountain regions of Poland under its CSR policy (PL3)	
Private Associations	Act as a mediator between farmers/ foresters and government	1. Designing the contracts as per needs of all stakeholders 2. Ensure quality of products 3. Ensure commitments are met 3. Free technical support	1. Fragmentation of interests can occur 2. Sustaining a collective approach over long-term can be a challenge 3. Dependence on public financing	E.g., the Flemish Forest Group in BE2, also private nature management companies in case study NL1, and Agentschap voor Natuur en Bos in BE1	
Animal Welfare Organizations / Veterinarians	- Farmer advisory for maintaining animal health and reducing carbon footprint of the animals	1. may help certify products 2. may help in monitoring	The organizations might not want to involve in animal farming altogether and may advocate against it	E.g., the animal welfare organization, 'Vier Pfoeten' that is part of ALMO Association in case study AT1	
Research Project teams	1. Professional execution of project 2. Can be a focal point between different stakeholders 3. Can support project funding	1. Lack of strict monitoring 2. Agreements with farmers/ landowners might not be legally binding 3. Project might be for short-term only	Project stakeholders usually rely on previous research and might not have practical experience	E.g., 1. Project partners such as Austrian Council for Agricultural Engineering and Rural Development, environmental consultancy, landscape planners, ecologists in AT2 case study 2. WWF Germany is the project lead of the initiative 'Landwirtschaft für Artenvielfalt' in case study DE2 3. Latvian Fund for Nature (LDF) was the team lead for European Commission's (EC) Life+ Programme for the restoration of Corncrake habitats in Dviete floodplains grasslands (LV2). LDF co-funded the project with EC	
Academician s/ Universities/ Research institutes/	- Scientific Support - Monitoring of environmental performance using novel technologies	1. Research may help in improving the contracts and project outputs	Researchers might delay application of contracts on field to ensure scientific vigor of their research	E.g., 1. University of Greifswald (DE3) 2. Thunen Institute (DE4)	

Type of actor/party	Roles	Benefits from involvement	Points of attention	Case study example	Evidence from the survey
Students/ Researchers				3. ASAJA (Spain, case study ES3) provides digital technologies such as crop monitoring and yield forecasting	
Ecologists	Train farmers to observe, count and document according to a certain monitoring design	1. Carry out monitoring 2. Carry out assessments	- Reliance is on short-term funding mechanism from project	E.g., 1. Team of ecologists/ researchers funded by the EU worked with 35 farmers on RBAPS pilot scheme in two regions of Ireland (case IRL2) 2. Bride project ecologists carry out the monitoring on an annual basis (IRL3)	
Citizens/ Consumers	Agri-environment supply chains include citizens as consumers, voters, and recreationists. Consumers are willing to pay for nature-inclusive farming and private goods, that can lead to delivery of multiple public goods.	- Encourage agro-tourism - Consumers are integral part of supply chain	Citizen behavior is an important driver of products and should be considered when making a value-chain contract	AT1, ES2,	
Shareholders	Have same responsibilities as farmers and landowners in the contract.	Contract objectives can be divided between shareholders	1. investments risks exist 2. loss of investors	E.g., involved parties are individual entrepreneurs who perform cutting operations in jointly-owned forests in Finland (FI5 case study)	
Banks (Private or Public)	Can be a potential agricultural financier. Also, the involvement can give corporate responsible image to the bank	- Financial risks minimalization		E.g., Rabobank finances and designs the contracts for the Biodiversity Monitor case (NL3 and NL4)	

6.2 Payment characteristic

Payments to farmers for providing AECPGs may be calculated in different ways. In general, the payment can be divided into a fixed component and a variable component. In the result-based approach, for instance, the latter considers the actual results in the PG provision (cfr. 'Reference-parameter for payment' in the glossary). Besides the way the payment is connected to output and input, other characteristics may be relevant. The most widespread parameter suitable for decision-making is the level of payment. In addition, there could be other issues, such as the presence of bonuses and the timing of payment delivery (relevant to farm finance). Table 4 below lists different types of payments and their characteristics for different contract types, with case studies cited as examples.

Table 4 Payment types and characteristics

Payment type	Advantages	Disadvantages	Points of attention	Case study example	Evidence from the survey
Compensation payments/ incentives paid by the rate per area, length, or quantity	<ul style="list-style-type: none"> - Farm supplies (like sowing seeds) are pre-arranged for the farmers - Farmers need not make monetary inputs 	<ol style="list-style-type: none"> 1. Monitored rigorously 2. Fixed indicators 	<ul style="list-style-type: none"> - Strict targets - Written Agreement 	<p>E.g.,</p> <ol style="list-style-type: none"> 1. Payment ranges from 115.55€/ha for application of dry animal manure to 2527.39€/ha for establishment of species/herb-rich cropland field margins in case study NL1 2. Some measures are paid per piece, like per small pools or individual trees as in NL1 3. The payment for the eco-grazing is 350 euros/ha/year 	<ul style="list-style-type: none"> - Respondents of all partner countries prefer compensation on an annual basis, and it also increases their willingness to enroll
Subsidies and tax benefits	<ul style="list-style-type: none"> - Paid annually - Financing depends on the level of objectives 	<ul style="list-style-type: none"> - Subsidies could differ from the actual costs the farmers incur 	<ul style="list-style-type: none"> - Amounts are fixed per nature objective - result-oriented payments 	<p>E.g.,</p> <ol style="list-style-type: none"> 1. Subsidies paid in case study BE4 	
Non-tradable emission certifications	<ul style="list-style-type: none"> - No obligatory requirements such as mandatory management measures 	<ul style="list-style-type: none"> - Farmers may need to pay for participation in the program - Farmers also might have to invest in changes in management styles to reach the targets of certification 	<ul style="list-style-type: none"> - Certificates can be sold out, which limits participation - Risk with organic the certification process can lead to slower payments 	<p>E.g., Farmers receive a success fee of currently 30 € per ton of CO₂ in the Humus Project in AT4</p>	
Tradable emission certificates	<p>It is another name for carbon credit, wherein the certificate represents a "permit that allows the holder to emit one ton of carbon dioxide"</p>		<ul style="list-style-type: none"> - Offsetting projects mostly bring short-term benefits to agribusiness companies but not long-term benefits to local 	<p>E.g. he scheme is self-funded, so income is mostly from timber harvests and carbon credits in FI1</p>	

Payment type	Advantages	Disadvantages	Points of attention	Case study example	Evidence from the survey
			communities or the environment		
Payment for Label or Brand	<ul style="list-style-type: none"> - Voluntary association with a label or brand - Consumer-oriented schemes 	<ul style="list-style-type: none"> - Even though farmers may get a price higher than standard, there is a risk that it would not cover cost of environmental efforts and other transaction costs (like the cost of the fee paid for membership) - Payments come from consumers, so there is a market risk -uncertainty on the added-value distribution along the chain (i.e., the bargaining power of intermediaries and suppliers is higher than farmers') 	Usually, for a specific product or service	<p>E.g.,</p> <ol style="list-style-type: none"> 1. Lump sum fee for WE label in BE3 2. 'Esprit Parc National' is a brand that is exclusively granted to products or services from economic activities that preserve biodiversity and heritages (case FR3) 	Most of the respondents from all partner countries are willing to enroll in contracts that can offer an "Environmental-friendly label."
Conditional bonus payments (like vouchers/ one-time bonus/ etc.)	<ul style="list-style-type: none"> - Low financial risk - No penalty in case of non-compliance - Can be paid in addition to contract compensation 	<ul style="list-style-type: none"> - No fixed price - Payments can be quite low and may not represent a necessary revenue for the farmers - Funding can be short-term 	<ul style="list-style-type: none"> - Incentives are more symbolic than a proper payment - Result-based payments 	<p>E.g.,</p> <ol style="list-style-type: none"> 1. Farmers are paid for GHG emissions saved in FR4, and farmers are paid an allowance for monitoring in AT2 and AT3 case study 2. Case study FR5 – farmers were incentivized (255,67 €/plot) if their plot contained at least 1 European hamster burrow assessed during the yearly counting 	

Payment type	Advantages	Disadvantages	Points of attention	Case study example	Evidence from the survey
				3. Depending on the performance of the agreed biodiversity measures, the farmer receives up to €3,000 per annum in case study IRL3	
Payment for product/ Private contracts	<ul style="list-style-type: none"> - Fixed price offered - Might be higher than the market price - Demand for 'sustainable' or 'organic' food is rising, which leads to better opportunities for the farmers - The focus of the contract is the regional value chain 	<ul style="list-style-type: none"> - Supply chain might be short, which narrows the market share - Dependency on the retailer for the premium price - contracts might not be binding 	<ul style="list-style-type: none"> - Payment for products poses risks to farmers under uncertain yields - value-chain based payments - There might not exist a premium market for the products 	<ol style="list-style-type: none"> 1. AT1 2. Price provided to the farmers from the distributor 'Harmonica' is higher compared to the price from doesn't incur the farmers' loss due to yield risks other producers of organic honey in Bulgaria (BG2) (6.50-11 euro per kg of honey) 3. Farmers get a premium from the retailer EDEKA for organic products in DE2 4. Farmers don't receive economic benefits or payment. They only get a higher market price for their olives (ES4) 5. forest owners are paid for nature-based tourism (FI2) 6. Agrifirm, a soy processor, and farmers set a price based on global market prices of soy. A premium for non-GMO soy is €500-550/ ton of dry soybeans (NL2) 7. Bio-Babalscy company cooperates with about 90 farmers for organic cereals in 	<ul style="list-style-type: none"> - Most of the respondents of all partner countries have a high willingness to receive their payments from buyers of the products, instead of public money, except respondents from Bulgaria and Latvia

Payment type	Advantages	Disadvantages	Points of attention	Case study example	Evidence from the survey
				case study PL4. However, the agreement is verbal.	
Land lease/ Land tenure contracts	1. Payment can be in the form of rent or investments for land acquisition	1. Need for additional funding sources for the nature protection and environmental measures as land lease payments might not be sufficient 2. Could be a financial risk	- Land for lease is awarded to agricultural holdings willing to cooperate and commit to farming guidelines	E.g., 1. Land tenure contracts with adjusted lease payments as in DE3 2. In FI4 case study, landowners and domestic animal herders can find each other and agree on a land-tenure contract for leasing pastures or grazing animals	Most respondents are willing to enter a contract of leased land with reduced rent, provided they agree to follow environmental management clauses as specified in the lease contract, except respondents from Austria and Finland
Online donations for conservation/ Crowdsourcing	- Market-based funding, so there is no need for public funding - Attracts investors/ donors - Can be a huge funding potential for private companies	- No direct monetary incentives to farmers/ landowners		E.g., In FI3, anyone can make an online donation or investment of a maximum of 50 euros which funds the restoration of 600 m ² of peatland, capturing a minimum of 45 kilos of carbon annually.	
Combination of incentive payments and product price	Farmers are incentivized with a bonus for meeting environmental conditions and are also paid market prices for their produce	Farmers may already be involved in other food supply chains and might already have acquired other labeling and certifications (like organic farming, high environmental value certification, etc.), and it can compete with this kind of approach	Usually done for specific products that the government or private actors need for sale	E.g., 1. Local governments in the city of Rennes and other municipalities from Rennes urban area pay farmers' prices for food and an additional bonus payment for environmental services (FR2).	

6.3 Object of contract solution: AECPG type and others

The object of a contract is one or more AECPGs. Even though a contract solution could theoretically target any AECPG, it is commonly acknowledged that specific contracts are fitting or necessary for specific AECPG. For instance, collective approaches, such as water quality, are crucial for landscape-level AECPGs. Result-based contracts are useful for improving biodiversity or other AECPGs that require parcel-level practice adjustments. Value chain contracts are not linked to a specific AECPG. Nevertheless, these contracts are likely adequate for AECPGs that attract consumers' interest (e.g., iconic species or ecosystem services such as potable water). Land-tenure contracts are effective for AECPGs that require long-term commitments.

The object of the contract can be mainly defined as the aim of the contract, which is based on the public good intended to be produced. It can be any of those listed in Table 5. The AECPG(s) intended to be produced are important as there is a connection with the performance and suitability of the different contract types/features discussed above. For example, result-based solutions may be more suitable for some biodiversity parameters and carbon stocks.

Table 5 AECPG types and characteristics

Public Goods	Contract solution types	Defining factors	Case study examples	Evidence from the survey
Biodiversity	- Result-based/ result-oriented	Functional agrobiodiversity, diversity of landscape, diversity of species, and regional biodiversity, are reflected in key performance indicators connected to farm-level agricultural management, such as percentage of grassland, regional protein input, nitrogen soil surplus, etc.	AT3, NL3, IRL2, BE3	<ul style="list-style-type: none"> - Farmers from Austria, Germany, Ireland, Netherlands, and the UK have been involved in biodiversity-related agri-environment measures for the past five years - Most of the respondents in all partner countries are interested in improving biodiversity in their countries
Climate regulation (carbon sequestration and/or GHG emission regulation)	Result-based/ result-oriented	Climate action, soil organic carbon, carbon payments, carbon credits, carbon farming, etc.	AT4, FR4, FI3	<ul style="list-style-type: none"> - Farmers from Germany, Italy, Poland, Netherlands, and the UK have been involved in climate regulation-related agri-environment measures for the past 5 years - Most of the respondents in all partner countries are interested in increasing carbon sequestration in their countries
Water-related AECPGs (quantity and quality)	Collective implementation/ cooperation contract-solutions		IT1, IT6, UK1, UK3, LV1	<ul style="list-style-type: none"> - Farmers from Austria, Germany, Ireland, Italy, Poland, Netherlands, and UK are involved in water-related agri-environment measures (water quantity and quality) for the past 5 years - Most of the respondents in all partner countries are interested in improving their water-related AECPGs
Resilience to natural hazards	Collective implementation/ cooperation contract-solutions	Flood control, drought control, pest management, soil health, animal health, etc.	IT6, UK1, UK3, BE1, FI5	

Public Goods	Contract solution types	Defining factors	Case study examples	Evidence from the survey
Quality and security of products	Value-chain solutions	Organic certification indicators like specific variety selection, certified seeds, non-use of fertilizers, organic slaughterhouses, etc.	BG3, PL4, ES2	
Landscape& scenery	Land tenure	Conservational and sustainable maintenance of the landscapes (mostly pastures)	FR1, BG4	<ul style="list-style-type: none"> - Farmers from Germany, Latvia, Italy, Ireland, and UK have been involved in landscape and scenery-related agri-environment measures for the past 5 years - Only the respondents from Germany, Ireland, Italy, and Latvia are interested in improving the landscape and scenery of their countries

6.4 Contract length

A contract is a formal agreement signed between two or more parties. Contracts are defined/qualified by different features arranged in combinations that outline several alternatives. The length of a contract is a specific feature that discriminates between different contract types and AECPG targets. More extended contracts are usually required to reach various environmental and climate targets. However, farmers' acceptability and contract duration are generally inversely related. In some cases, however, farmers can prefer long contracts when these ensure additional benefits such as reduced land rents (e.g., land tenure-related contracts).

Time-horizon (length) is the duration of the contract, which has been further defined through case study examples in Table 6. Long-term contracts may have different environmental effects and preferability for farmers than short-term contracts. For example, tenant farmers who only have short-term security concerning land availability may face barriers to participation (which may also be an explicit legal requirement).

Table 6 Contract length characterization.

Length of the contract	Benefits	Disadvantages	Renewal	Case study examples	Evidence from the study
Long-term	<ul style="list-style-type: none"> - High acceptance of the contract - Market security - Long-term behavior change can occur - Farmers gain knowledge due to long-term collaboration between advisor and farmer 	<ul style="list-style-type: none"> - Dependence on a single large processor/retailer - Participation may change hands - Change in national policies can lead to legal uncertainties 	<ul style="list-style-type: none"> - Renewal possible (BE1) - Participation is transferrable (BE4) 	E.g., <ul style="list-style-type: none"> - AT1: Some oxen farms have been working under ALMO for 30 years - Flemish nature management plan participation is 24 years (case study BE4); however, participation is transferrable - Forest bank contracts in Indiana and Virginia are 99 years long 	
Short-term	- 1 to 5 years	<ul style="list-style-type: none"> - Results may not be pronounced, and it's harder to evaluate if environmental objectives have been met or not 	<ul style="list-style-type: none"> - Either no renewal or - Renewal is possible for more extended periods (BG1) 	E.g., BG1 requires farmers to participate for 3 years - FR2 is a hybrid contract that farmers can participate in for 3 years - IRL2 - NUTRINFLOW, LV1, is a 2-year contract	Most of the respondents preferred a 5-year contract length. However, the majority of respondents from Bulgaria preferred a 1-year contract length. Only a few respondents only preferred a 10-year or longer contract length
Medium-term	- 5 to 10 years	<ul style="list-style-type: none"> - Results may not be pronounced, and it's harder to evaluate if environmental objectives have been met or not 	<ul style="list-style-type: none"> - Renewal is possible after evaluation - Renewal can be annual 	E.g., BE3, FR4, IRL1	

Length of the contract	Benefits	Disadvantages	Renewal	Case study examples	Evidence from the study
Flexible	<ul style="list-style-type: none"> - Open-ended contracts - Could be voluntary - Could be market-based contracts 	<ul style="list-style-type: none"> - Risk of not receiving the payment in due term of the contract - Objectives may be time-consuming to achieve; thus, not giving farmer flexibility to leave 	<ul style="list-style-type: none"> - The contract can be renewed easily - some contracts cannot be terminated (LV4) 	<p>e.g., in the case of AT4, the slow process of humus accumulation binds farmers in their contract for a long time, even though the contracts are open-ended</p> <ul style="list-style-type: none"> - In study FI4, a contract's length depends on the partners. The landowners' agri-environment support from the EU if the circumstances fulfill the demands. In this case, the length of the contract is five years. 	
Fixed	<ul style="list-style-type: none"> - Contract duration may be open-ended or fixed; however, leaving the contract can lead to termination - Some contracts are permanent; withdrawal is possible 	<ul style="list-style-type: none"> - If there is a change in climate or socio-economic aspects, the farmer does not want to be enrolled in the contract 	<ul style="list-style-type: none"> - Renewal is difficult; it might be possible after a long duration - Termination can result in financial penalties or non-renewal - For a permanent contract, no renewal is needed 	<p>E.g.,</p> <ul style="list-style-type: none"> - In case of ES1, the contract is terminated if farmers exit the cooperative - renewal is possible every 30 years in case study FI1 	

6.5 Monitoring & Enforcement

Monitoring and enforcement activities are necessary to ensure that farmers carry out the conservation measures for which they receive payments. Monitoring refers to surveying the implementation of measures farmers agreed upon when they committed to participating in a network project. Enforcement refers to procedures and sanctions that are applied in case of non-compliance. In this context, monitoring should not be confused with monitoring programs aimed at studying/assessing the environmental impact of a specific agri-environmental scheme. Monitoring and enforcement are better summarized in Table 7 below.

Table 7 Monitoring types and characteristics

Monitoring	Benefits	Disadvantages	Points of attention	Case study examples	Evidence from the survey
Private bodies hired by the market actors or by market actors themselves	- The retailer/processor bears the costs of inspection		May have stricter monitoring criteria than required by the retailer/processor, which might lead to termination of contracts	E.g., AgroVet GmbH monitor and certify ALMO farms in AT1 - In IT4, Barilla hires independent third-party control bod to annually audit farmers subscribed to the "Carta del Mulino" project - In NL2, the processor controls the end product	
Private bodies hired by the govt.	- The hired private institutions do not have the final call on the payments or incentives to the farmers.	- since they are just intermediaries, they might not fulfill the job meticulously	- The consequence for non-compliance could be suspension of payments	E.g., - BE1: contract monitoring is handled by an independent body using a public tender - in case study BG1, to be a part of NATURA 2000 site, the Bird association monitors and determines the participation and payments for the farmers	
Public bodies	- No sanctions for non-compliance - Check of the area objectives can be seen as additional support for the farmers - Can be public bodies hired by government, thus eliminating private intermediaries - monitoring could be locally led	- There is a risk that the control criteria will not be met, but the non-sanctioned area objectives reduce the risk	- Control criteria and their indicators are sanctioned in the event of non-compliance - Fines can also be assigned to the landowners in case of law infringement	E.g., control of RNP farms is carried out by the national control authority (AgrarMarkt Austria – AMA) in AT3 - Results of LV1 case study, NUTRINFLOW, is controlled and monitored by a state limited liability company	
Certification organizations	- For market-based organic products - The certification provides premium prices in the market	- Strict controls and monitoring of the products	- Consequence for non-compliance could be termination of the contract (BG2)	E.g., - in the case of study ES2, there is strict control by the certification authorities for organic grapevine production	

Monitoring	Benefits	Disadvantages	Points of attention	Case study examples	Evidence from the survey
				<ul style="list-style-type: none"> - In case FI1, annual third-party audits by FSC group certification were done and managed by the non-profit organization TNC. - FR4, Bleu-Blanc-Coeur association certifies the milk if it meets the product requirements 	
NGOs and non-profits	<ul style="list-style-type: none"> - Not as strict requirements like government or market bodies - 	<ul style="list-style-type: none"> - not so-strict criteria might lead to the unfulfillment of environmental objectives 		<ul style="list-style-type: none"> E.g., in case study BG4, the NGO Bulgarian Society for Protection of Birds manages and monitors the project - in case study DE5, farmers are checked for compliance with the conditions of participation either by the local water supplier or by the non-profit FiBL, Germany - Provinces and national government delegate species monitoring to NGOs in case NL1 	
Private experts	<ul style="list-style-type: none"> - Experts might help in recognizing biodiversity in addition to monitoring - Expert monitoring can be used for training, and advisory 	<p>monitoring by subject experts usually is one-dimensional and focused on results related to a specific environmental objective. The experts do not account for other factors for not meeting the objectives</p>	<ul style="list-style-type: none"> - usually, result-based and value-chain contracts hire an expert for stringent monitoring of specific results 	<ul style="list-style-type: none"> E.g., In the case study BG1, monitoring is done by biodiversity experts several times per year - In case DE1 winegrowers take advantage from the monitoring to get the local flora and fauna near their vineyards, better known 	
Self-monitoring	<ul style="list-style-type: none"> - Voluntary - mostly collective contracts 	<ul style="list-style-type: none"> - Farmers might not be able to monitor effectively, and hence may not meet 	<ul style="list-style-type: none"> - there might be follow-up checks by experts - usually not value-chain contracts 	<ul style="list-style-type: none"> E.g., in case study AT4, decreases in humus content could lead to a partial or complete refund of the success fee 	<p>Most of the respondents' willingness to enroll isn't affected by the option of self-</p>

Monitoring	Benefits	Disadvantages	Points of attention	Case study examples	Evidence from the survey
		the objectives and lose the payments - Farmers have to bear the amount needed for monitoring		<ul style="list-style-type: none"> - In case BE2, a Forest Group coordinator and his team follow up on the specific objectives as agreed upon by the different forest owners - In case ES1, monitoring is undertaken by the Arrozuza cooperative, which is indirectly paid by the farmers that are members of the cooperative - In case FI3, experts of the Carbon Market make self-monitoring when resources allow - In FI5, monitoring is through an internal control mechanism (e.g., annual partnership meeting of all shareholders) - IRL3, BRIDE project, farmers monitor themselves. However, annual checks are carried out by ecologists - In IT5 and IT6, a final report needs to be submitted to financing parties 	monitoring. Only the majority of the UK respondents' willingness to enroll increases considerably if the contract offers self-monitoring
No controls	<ul style="list-style-type: none"> - Integration of local knowledge to promote agro-ecological transitions - Even though the commitments are not legally binding, the signatories have to respect specific rules 	<ul style="list-style-type: none"> - Farmers may not meet the environmental objectives and still be getting subsidies and payments for it - Extra burden on farmers to keep their contract terms in check 	<ul style="list-style-type: none"> - Result-based and value-chain contracts cannot utilize any monitoring 	<ul style="list-style-type: none"> E.g., - In case study DE4, there is no monitoring. Instead, detailed documentation of one representative field for each crop grown is required from each participating farm - In case study FI2, the agreement between private forest owners and nature-based tourism enterprises is based on trust - In case study FI4, the contracts are maintained by an online service 	
Monitoring using special indicators	<ul style="list-style-type: none"> - Fixed indicators are used to monitor the quality of farms/ forests/ products - 	<ul style="list-style-type: none"> - Indicators need to be changed/ updated as per the changing socio- 	Farmers should be trained to use special indicators for monitoring so they	E.g., in case study FR2, farms are given a farm score using the French IDEA method (which includes 42 sustainability indicators) by a government association called EBR	

Monitoring	Benefits	Disadvantages	Points of attention	Case study examples	Evidence from the survey
		economic or market conditions	know what the contract demands.		
Monitoring for product category regulation	- Assurance of high-quality of products	<ul style="list-style-type: none"> - Reductive in terms of environmental benefits - Regional references and numeric parameters should be updated 	<ul style="list-style-type: none"> - Each product has different criteria - The farmer has to prove, using invoices, vegetation or field indicators, etc., that the criteria for the product are met 	E.g., FR3 - In FR4, farmers can get certification from Bleu-Blanc-Coeur only after their milk is analyzed	
Monitoring farm performance (annually)	- Helps funding parties to ensure the farm characteristics are up to the standards of the contract		Monitoring should be followed by	E.g., in the FR5 Hamster Program, the Departmental Directorates of Territories monitor the annual management plan and follow with a field check	

6.6 Sanctions

Sanctions are contract clauses specifying the rules in case of non-compliance with the contract terms. In result-based contracts, fines are often not included in case the farmers do not meet the target, but differences may arise, for instance, if a fixed payment rate in the contract is present. Different types of sanctions and their case study examples are given in Table 8 below.

Table 8 Types of sanctions

Sanctions (In case of non-compliance)	Points of attention	Case study examples
Termination or reduction of payments	- Due to non-achievement of contract objectives	FR4 - In case IRL2, payments to farmers were conditional on achieving biodiversity targets - In case LV1, requirements are not respected, landowners can be penalized, which can lead to a reduction of direct payments
Termination of contract	- Due to non-compliance with contract rules	BG2, IT4
Non-renewal of contract in case of non-compliance	- Due to not meeting the contract expectations sufficiently and on time.	
Sanctioning of control criteria and their indicators in case of non-compliance	- Usually happens when results achieved are partial, or there is a constant delay in meeting contract objectives	AT3

6.7 Flexibility

Flexibility concerns the possibility of customizing a contract to local/individual cases. The flexibility is relevant as it usually increases the acceptability of a contract. For instance, the possibility of a farmer adopting a contractual framework to his farm situation increases the uptake of a contract. On the other hand, the flexibility increases the transaction costs adding a bargaining process and potential trade-offs. Flexibility is also a core aspect of result-based contracts. Indeed, the philosophy of such contracts is based on giving the farmers complete freedom of choice (i.e., perfect flexibility) to reach the result of interest. However, the drawback of such flexibility is the introduction of a critical aspect connected to the risk of the farmers to fail to achieve the result.

Flexibility is an essential characteristic of the contract. Flexibility may apply to several parameters, such as the length of contracts, the selection of measures, the prescriptions to be undertaken, the area under contract, etc., as explained in Table 9 below.

Table 9 Flexibility types in contracts

Flexibility in contract	Benefits	Disadvantages	Points of attention	Case study examples	Evidence from the survey
High Flexibility for management practices	<ul style="list-style-type: none"> - Farmers are free to decide which management activities they choose - Usually, farmers work as a cooperative 	<ul style="list-style-type: none"> - Achieving objectives could be lesser - High flexibility in management can lead to wrong decisions - Low monitoring - Farmers have to bear the costs of changing the management practices 	<ul style="list-style-type: none"> - Fixed control indicators needed if there is high flexibility in contract 	<p>E.g., in case study AT4, application of organic and synthetic fertilizers not based on plant and soil demand produce huge N-losses</p> <ul style="list-style-type: none"> - Farmers organize themselves in an organization of producers for organic honey (BG2 case study) - In FR1 case study, the breeder adjusts the number of animals to be deployed according to his idea of the feed availability of each plot at a given time 	Respondents from all countries have a high willingness to enroll if they are flexible to decide about the contract's management practices
Flexibility to choose contract duration or leave program	<ul style="list-style-type: none"> - Voluntary association as per farmers' will 	<ul style="list-style-type: none"> - Not meeting the objectives and receiving the payments in due time 	<ul style="list-style-type: none"> - Renewal might also be voluntary 	<p>E.g., In FI2, contract parties can agree upon the length of the contract</p>	
Flexibility over areas to enroll	<ul style="list-style-type: none"> - can help farmers and foresters to choose different plans for their plots of land and not be involved all their land in one type of contract 	<ul style="list-style-type: none"> - The area is only temporarily protected 	<ul style="list-style-type: none"> - Larger the area enrolled, the more benefits it might produce; which could be more product, more biodiversity, etc. This can lead to higher payments 	<p>E.g., In case FI6, there was flexibility regarding the characteristics of forest areas that could be accepted for the contract</p>	
Flexibility to enter other contracts	<ul style="list-style-type: none"> - More payments for farmers - Multiple AECPGs delivered, and more environmental objectives met 	<ul style="list-style-type: none"> - Farmers' loyalty is questionable 	<ul style="list-style-type: none"> - Usually, farmers cannot enter into same contract with same rules as existing one if it is a value-chain contract - Farmers can enter multiple nature management contracts 	<p>E.g., The biodiversity monitor, NL3, allows farmers to be enrolled in multiple contracts with different parties, and all parties can give financial rewards for good performance based on the same set of key performance indicators</p> <ul style="list-style-type: none"> - Farmers enrolled in Humus Program (AT4 case study) are free to participate in other agroecological programs (e.g., GAP, ÖPUL, AMA, etc.) 	

6.8 Information as a part of the scheme/contract

Information and advice may be provided to farmers as part of the scheme. Information provision may interact with other contract features.

Several inefficiencies attributed to agri-environmental schemes are linked to an information problem. We can distinguish between information asymmetries where the land manager has more information than the payer concerning costs, “spatial targeting” issues where local scale features affect the environmental effectiveness of different practices, and farmers’ knowledge about efficacy of environment-friendly practices. Two main strategies have been proposed to cope with information gaps: i) monitoring programs and ii) technologies to improve spatial targeting. On the other hand, auctions and result-based contracts are proposed to tackle information asymmetry, but their mechanisms are different. For instance, the periodic measurement of results entailed in the result-based approach has been acknowledged to allow a long-term endogenous reduction of information gaps thanks to potential learning processes that could affect the farmers involved. In auctions, the regulator indirectly gains information signals on the costs incurred by farmers, and therefore the information gap between the regulator and farmers is potentially eliminated. The nature of further information and advisory sources that can be included in contracts can be found in Table 10 below.

Table 10 Availability of advice and information in contracts

Availability of advice and information	Benefits	Disadvantages	Points of attention	Case study examples
Advice & training by public body	<ul style="list-style-type: none"> - Advice by an involved public body - Reliable 	<ul style="list-style-type: none"> - Resource intensive to operate 	<ul style="list-style-type: none"> - Usually a feature of public-public contracts 	E.g., In FI6, the forest owners could ask advice from Forest Management Associations for forest management, decision-making, and operations
Advice & training by private bodies	<ul style="list-style-type: none"> - Efficient information and readily available 	<ul style="list-style-type: none"> - Depends on who is funding them for efficient delivery of advice and training 	<ul style="list-style-type: none"> - can be hired by public bodies or market actors 	E.g., in AT3, an environmental consultancy agency is hired to provide advice and expertise to farms
Advice and training by experts	<ul style="list-style-type: none"> - Evaluates existing nature deficits - Can help recognize new and rare species 	<ul style="list-style-type: none"> - Experts can advise only on their specific subjects, so it is one-dimensional 	<ul style="list-style-type: none"> - If payment is in terms of product premium, advice and support at individual farm level become necessary 	E.g., <ul style="list-style-type: none"> - In IRL2, farmers received advice and support from the RBAPS Pilot team - DE2
Advice and training by NGOs/ non-profits	<ul style="list-style-type: none"> - Expert education and training - Can connect to other stakeholders for more information and training 	<ul style="list-style-type: none"> - Hiring NGOs and non-profits for advisory can reduce the compensation amounts farmers receive 	<ul style="list-style-type: none"> - Work in conjunction with financing bodies such as public bodies or market actors 	E.g., In case study LV1, the collaborating NGO, Union Farmers Parliament, has the objective to train and educate farmers <ul style="list-style-type: none"> - In PL1, contracted NGOs must organize at least 4 trainings for farmers, beekeepers, and school pupils concerning specific topics related to biodiversity and ecological awareness
Free advice by participating stakeholders	<ul style="list-style-type: none"> - Free advice without engagement - locally-led initiatives 	<ul style="list-style-type: none"> - Risk about the quality of advice - loss of key personnel can delay farmers' support and advisory 	<ul style="list-style-type: none"> - Already part of the project, so their budget is already accounted for 	E.g., In BE2, the forest group team provides the foresters with free advice <ul style="list-style-type: none"> - In the IRL1 case study, farmers are trained and supported by designated farm advisors
Grant money for advice and training	<ul style="list-style-type: none"> - Funding parties do not need to hire experts for advisory and training 	<ul style="list-style-type: none"> - grant money could be misused 	<ul style="list-style-type: none"> - proper channeling and allocation of grant money needs to be ensured 	E.g., in NL3, farmers get 1,500 euros per farm (one time only) for education and consult about sustainable farm management

6.9 Eligibility/ Conditions for participation

Contracts always include participation conditions (Table 11) that depend on the legal status such as agri-environment-climate measures are targeted at farmers. More specifically, value chain contracts often include clauses limiting farmers' participation in specific areas; collectives may consist of clauses of contiguity between the collective participants, etc.

Table 11 List of conditions for participation

Eligibility/ conditions for participation	Benefits	Disadvantages	Points of attention	Case study examples
No special conditions	- Farmers are more open to participating if no conditions exist	- Non-compliance with general conditions can lead to non-payment or termination	- Contract terms can appear vague if there are no special conditions involved	E.g., FR1, - In the UK1 case study, there are no conditions for participation; however, landowners are required to submit progress reports every quarter along with expenses claims
Limitations to using the brand name/labeling	- Farmers focus on fulfilling the contract objectives to be able to use the brand name or labeling to sell their products at higher rates	- Non-compliance can lead to interdiction of the brand use	- Product category has to meet the criteria set	E.g., in FR3, farmers have to respect the commitments to use the 'collective brand' name
Farmers/ stakeholders should have consensus over measures	Consensus is beneficial for collectives to work together		Consensus over measures doesn't mean consensus over contract objectives.	- FR5, IRL3
Agreement on environmental targets and action plan beforehand	Beneficial for result-based and value-chain contract holders since the contract terms are clearer in this case	- Payment is based on agreed-upon targets, which could be risky	Non-compliance in such cases can lead to the termination of payments or contracts	E.g., IRL1 - In case study IRL4, one key requirement for participant farmers is submitting the complete spreadsheet of farm operational data - FI3
Not be participating in other AES	- To avoid potential double payments with other AES	- Farmers might not be able to achieve multiple AECPGs	- Bigger contract areas and longer contract duration should be considered if this is the special condition.	E.g., - It is not possible to enter other contracts while being enrolled in European hamster protection program (FR5) - In IRL2, lands entered into other AES were excluded from entering the RBAPS Pilot
A fixed duration of participation	Farmers can plan their management activities according to a fixed schedule	It would not allow farmers to choose contract duration at will	Conditions like spatial, environmental, political, and economic should be considered	E.g., To participate in IT3, farmers need to commit to the contract for 20 years

Eligibility/ conditions for participation	Benefits	Disadvantages	Points of attention	Case study examples
			while signing up for the fixed duration	
A minimum number of farmers need to participate	- promotes active participation	- The strong interdependenc e of the farmers can cause failure if someone does not meet expectations	Many contracts start with only a few farmers and may expand to higher numbers if the contract is good. However, this condition doesn't allow that	E.g., In case study IT6, a minimum of 15 and a maximum of 100 farmers have to be participating in each ITP proposal - In NL1, there needs to be a minimum of 2 farmers to join a collective - In BE2, a minimum number of members need to be present to constitute a private association legally
Organic certification of enrolled farms	- Already certified farms ensure high- quality products - No money is spent on checking the farm status - Organic farms can form associations and transfer knowledge	- Farmers will have to spend their own money on organic certification/ or organic status of the farms	- Mostly a requirement for value chain contracts where farmers are paid market-based premiums on products	E.g., In PL4, Bio-Babalscy case, participating farms must be certified as organic - in AT3, only farmers who already participated in measures such as "Organic farming" of the Austrian AES 'ÖPUL' are allowed to participate - In BG1, enrolled agricultural land has to be a part of NATURA 2000 sites - in ES2, farms should have organic-certified grapevines for producing premium-quality wines

7 Design guide - decision trees for innovative contract types

The following section aims to serve as a design guide for choosing and designing novel contractual solutions for the provision of public goods, in particular environmental ones. It is prepared for on-ground application by all actors involved in the design, implementation, and financing of voluntary measures where farmers, landowners, and other stakeholders are contractual partners. Specifically, the design guide is intended to be a comprehensive systematic process for designing AECPG contracts, including design variables, determinants, and legal and technological aspects, while considering the various roles at different governance levels during the implementation process.

7.1 Choice of contract solution

Deciding upon the appropriate voluntary scheme depends on some essential steps. Each step poses critical questions that need to be answered before selecting the suitable contract type). These are:

A. Targeted public good(s): What public goods/ ecosystem services/ environmental and climate objectives are targeted? What are the expected ecological achievements?

B. Decision context: What are the different instruments and contractual solutions available for achieving the objectives?

C. Technical feasibility: Availability of expertise and training and development staff? Scale?

D. Actors involved: Stakeholder involvement and motivations? Farming community reaction?

E. Funding: Sources of funding? Calculation of the payments? Administrative support?

F. Other factors: Cost-effectiveness. Market Preferences.

G. Legal Framework: Factors for implementation (like environmental legislation)? Mandatory requirements?

Below is a flowchart incorporating the main necessary steps to be evaluated while choosing an instrument (Fig 5). The result of choice can be one of the contract types studied here, mixed, another type (e.g., individual practice-based), or even none. One of the critical steps in the implementation of innovative contract types is to detect if the new contract type is a better option or not compared with what is in place.

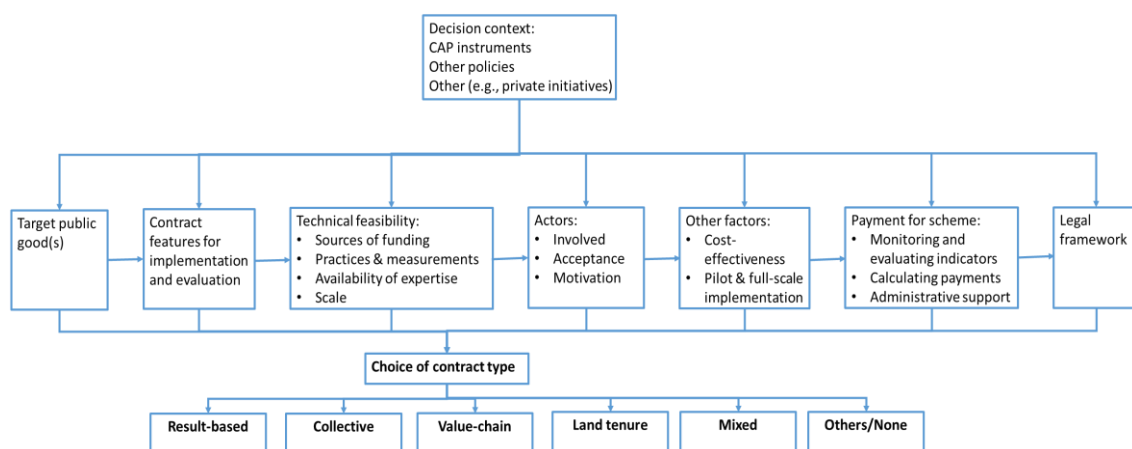


Fig 5 Decision tree for contract type

We further illustrate on the choice of different contract types individually through decision trees in the following sub-sections that can help practitioners and other stakeholders in efficient contract design and implementation decisions.

7.2 Result-based contracts

For result-based payments, it is necessary first to identify the availability, source, and type of funding and, if this is public funding, to check if the contract can comply with funding requirements. Then the availability of knowledge, skills, and institutional capacity must be considered. It is crucial to assess whether the target farmers' expected response and uptake will be sufficient to achieve the environmental objectives and, if relevant, whether farmers will cooperate with other stakeholders to develop result indicators to be applied. It is also essential to consider how to pay for the objectives achieved. It also requires verification of results through evaluating indicators and adding transaction costs to the calculation of payments¹. We illustrated a decision tree below (Fig 6) to design result-based contracts efficiently.

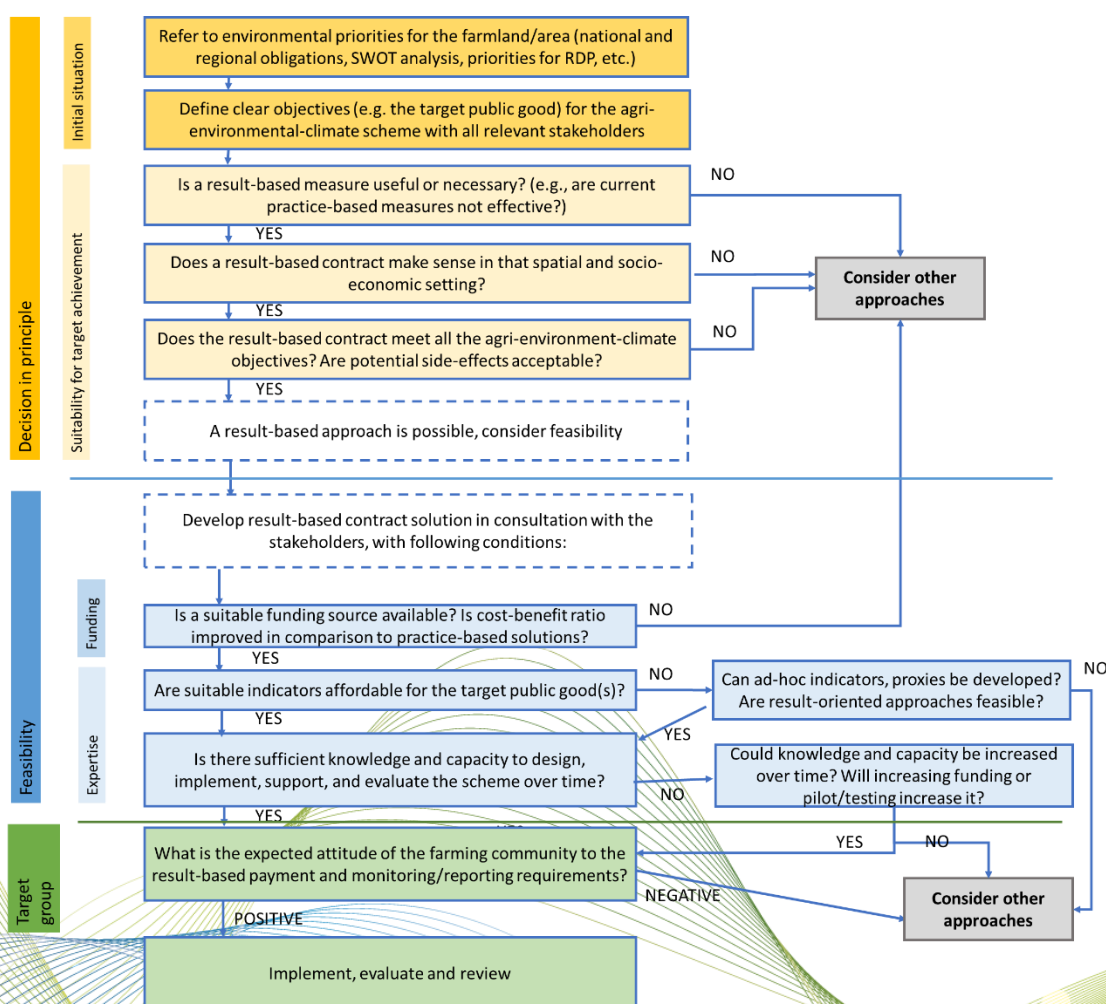


Fig 6 Decision tree for designing result-based contracts

¹ Section 4.7.4 of DG AGRI Guidance document: technical elements of agri-environment-climate measure in the programming period 2014-20 (version November 2014). Brussels.

7.3 Collective contracts

A vital design step in collective contractual solutions is the role of specific actors in implementing the contract, especially collectives, cooperatives, and the associations of farmers and foresters. Farmers might not be highly accepting of contract features involving collective payments or decisions. So it is important to consider the feasibility of a collective contract and provide the practitioners with the flexibility to adapt the contract design to collective choices. So, the decision tree given below (Fig 7) mainly includes a loop for decision-making and flexibility before designing a collective contractual solution.

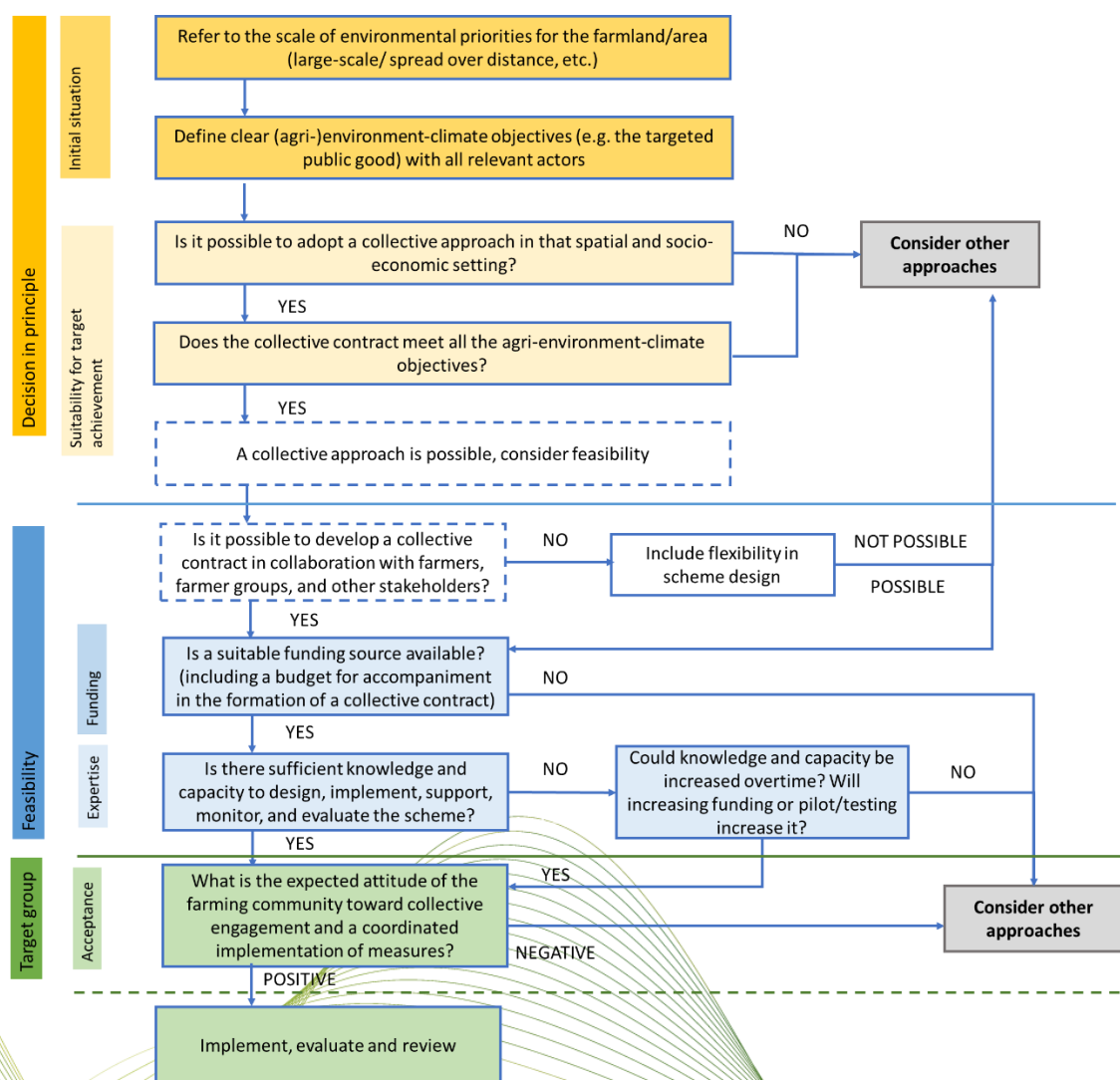


Fig 7 Decision tree for designing collective contracts

7.4 Value chain contracts

Value chain contract types usually pay the farmers in exchange for a particular product derived from environmental prescriptions attached to a contract for the provision of a private good, assuming consumers are also willing to pay for the public good when purchasing the private good. So, the role of the market, market players, and buyers/consumers are important in designing a value-chain contract type. Thus, before designing and engaging in a value chain contract, it is critical to check the market conditions and product requirements and then match them to the environmental objectives they intend to meet with the product. If the market conditions are unsuitable, practitioners should consider using other contract solutions. Provided below (Fig 8) is a decision tree that helps guide practitioners on steps to choose and design a value chain-based contract.

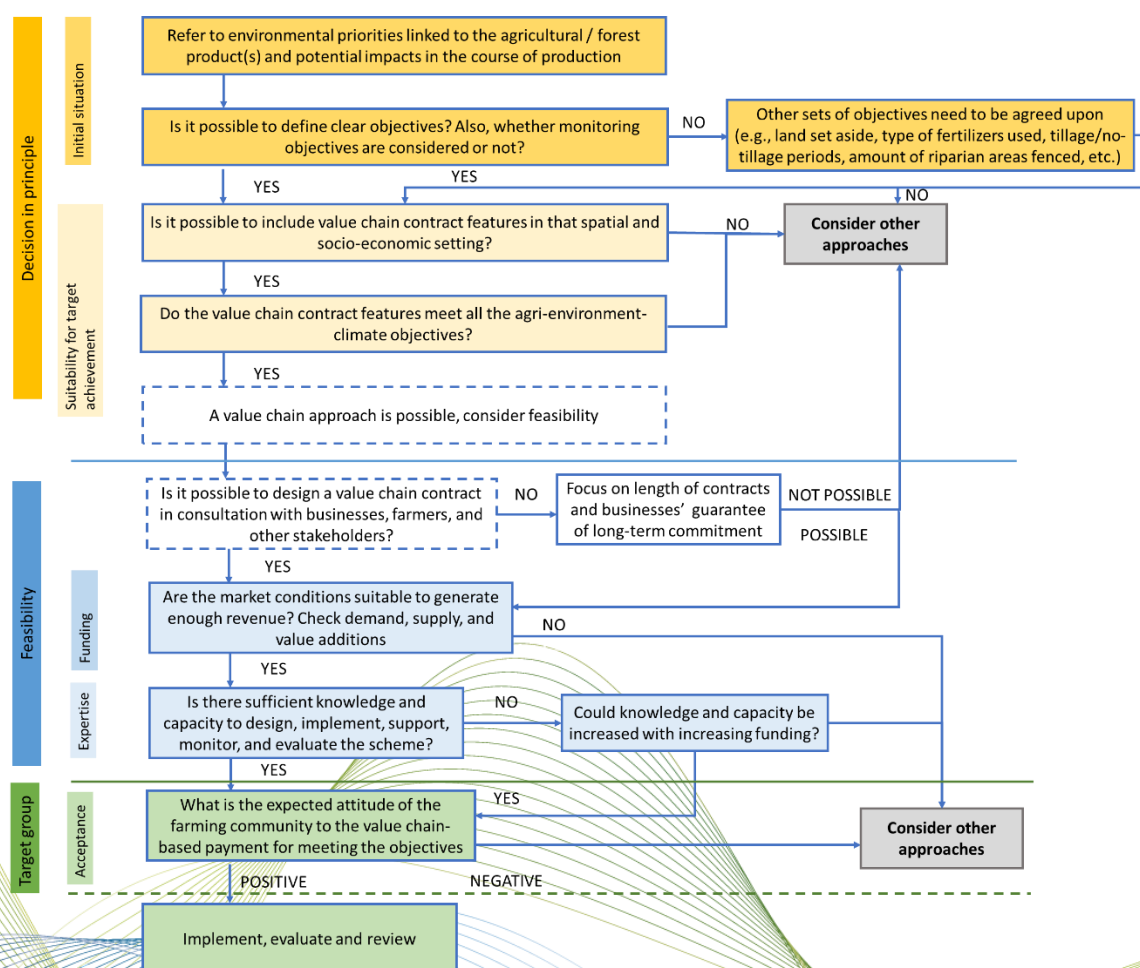


Fig 8 Decision tree for designing value chain contracts

7.5 Land tenure contracts

An important step in designing land tenure contract solutions is engaging with landowners as primary stakeholders; in particular, it is important to check for landowners interest in promoting tenure solutions that provide public goods (e.g., public owners, etc.). Since payments are based on land leased, the legal framework strongly determines the contracts. The figure below (Fig 9) will guide practitioners on how to design a land tenure contract.

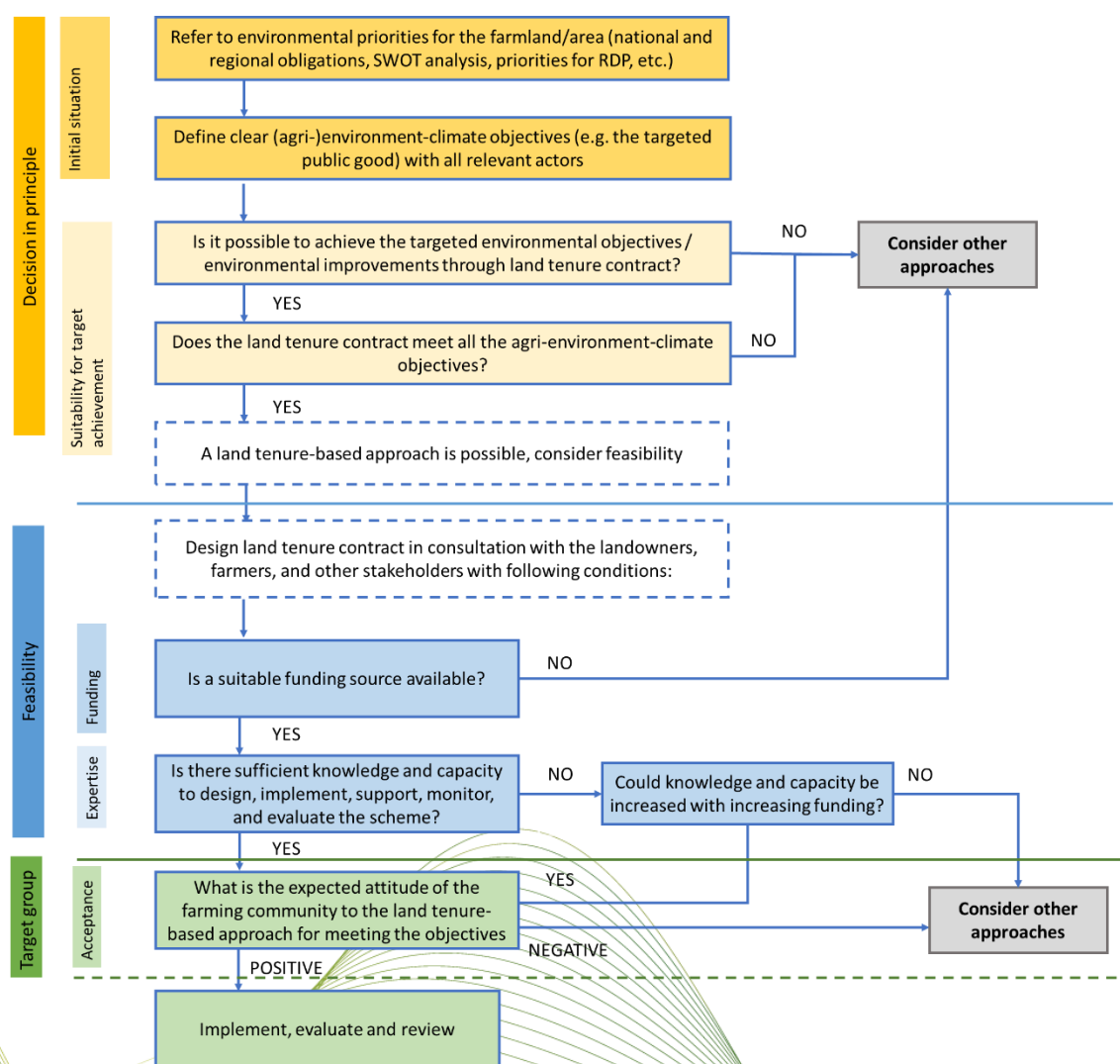


Fig 9 Decision tree for designing land tenure contracts

8 Discussion, Conclusion, and the next steps

8.1 Discussions and next steps

This document presents insights from the literature review and data, results, and contents from different work packages of CONSOLE, especially from WP1, WP2, and WP3. The CONSOLE framework and the design guide will be shared among practitioners and developed into a supporting web-based and interactive tool for actors in the field, enabling the delivery and sustainability of AECPGs. Insights will improve policy design toward achieving the Sustainable Development Goals, mainly through environmental policies and the post-2020 CAP. The design guide, annexed to D1.7, is the condensed version of the framework. It includes the contracts' model and features, decision trees for choosing the type of contract to apply, and a general flowchart for designing the same. The short design guide provides suitable visual solutions for applying to different contract types.

In particular, the framework has been improved with inputs from task T5.2, wherein we tested the framework and the design guide with the Community of Practice (CoP), including project partners. Also, partners have tested the framework and collected internal feedback to analyze the usefulness of the framework and suggestions for final refinements, as well as policy-relevant feedback through ad-hoc workshops.

Deliverables linked to the draft framework:

- **D5.2** – Guideline for testing the solutions catalogue by CoP and partners
- **D5.5** – Report on ground-truth testing of the framework in real life and lessons learned from testing

8.2 Conclusions

The framework presents and analyzes the individual components of result-based, collective, value-chain, and land tenure contracts. Implementing such innovative solutions is complex, and the decision trees can facilitate practitioners and decision-makers in that direction. The framework also includes the option to consider whether the reviewed innovative contracts are an efficient solution for the socio-economic contexts in which they operate. Indeed, one of the specific messages this document delivers warns against the reproduction of successful examples without considering a range of aspects such as traditions, social and cultural capital, and consumers' willingness towards public goods. The analytical approach presented in the framework also helps in the identification of parts or components of the different contracts that act as "weak links" and the potential to combine different contract typologies. That approach facilitates the development of customized AEC schemes that fit at best to different contexts.

9 Appendix

9.1 Glossary

The glossary provides definitions of terms and concepts included in the CONSOLE Project, particularly in the conceptual framework.

Academic version

Tenure-related -> feature of a contract affecting the property rights on the land. Tenure-related contracts can be differentiated according to whether land use rights on communal resources are granted to a third party (e.g., grazing rights granted to farmers conditional to specific herd/flock management – case study BG1) or whether a landowner agrees to give up part of his land-use rights to achieve an environmental target (e.g., Forest bank case study [FI1](#)). Typically, land tenure contracts span a long-time range and therefore are acknowledged to fit better than conventional incentive-based schemes to achieve a range of environmental targets.

Reference parameter for payment -> a variable (e.g., number of birds, hectares under a prescribed practice, etc.) on which the payment of an agri-environmental scheme is linked. Parameters can be related to a specific environmental variable (e.g., higher species density, higher soil organic matter, etc.) or to a specific management action (e.g., delay of mowing, hedge planting, etc.) thought to lead to an environmental outcome. The former characterizes result-based schemes, whereas the latter defines action-based schemes (Hanley et al., 2012). The reference parameter can also be classified according to the type of indicators that can be calculated. For instance, direct biodiversity indicators relate to species sampling (e.g., the number of spiders, earthworms, etc.). Indirect indicators of biodiversity are based on parameters linked to biodiversity, such as habitat diversity. Indirect indicators can also originate from models developed to assess an environmental outcome based on variables. In a strict sense, result-based schemes entail one or more direct indicators, whereas indirect indicators are employed in *result-oriented* schemes.

Role of cooperation among farmers/actors -> two or more farmers/actors working together to achieve a common goal identifies cooperation or collaboration. The role of cooperation can take different forms according to its structure and level of interaction between the parties. Cooperative institutions can be structured as a single entity represented by an intermediary. For instance, collaborative contracts are agreed upon with Sami villages for the conservation of predators in Sweden (Zabel & Holm-Müller, 2008). In that case, the village chief is the intermediary that acts as the liaison with the paying agency, manages controversies, and distributes the payment to the community. Such an organization also involves that failing to achieve the environmental goal is the members' responsibility. That has relevant effects on transaction costs,

monitoring, and enforcement. For instance, in the so-called joint liability approach, the environmental result achieved by a random member of the community is taken as a reference for evaluating the achievement of the whole community (Cranford, 2014). In other collaborative forms, the members agree on a plan of activities related to specific practices or interventions to achieve an (environmental) goal that requires a collective approach. However, no formal hierarchical structure is present, and each member is individually responsible toward the paying agency. Such forms of collaboration can also be defined as "networks" like in the case of the "Fruit orchard Farnsberg" project in Switzerland.

Degree of connection with private goods provision -> the connection with private goods of AECPGs contracts concerns different topics such as jointness, multifunctionality, and ecosystem services. The jointness concerns the *quantity* of a public good provided in connection with producing a private good. That is relevant for the estimation of the additionality, for instance. The multifunctionality is usually targeted to the design of a farming system that aims to optimize the synergies between several functions such as food production, recreation, environmental quality, etc. Multifunctionality is closely related to the ecosystem services approach. Still, the latter also involves relevant attention toward the socio-ecological processes transforming an ecosystem function in service for (different sectors of) society.

Contract and length of contract -> a contract is a formal agreement signed between two or more parties. Contracts are defined/qualified by different features arranged in combinations that outline several alternatives. The length of a contract is a specific feature that discriminates between different contract types and AECPG targets. More extended contracts are usually required to reach a range of environmental and climate targets. However, farmers' acceptability and contract duration are generally inversely related. In some cases, however, long contracts can be preferred by farmers when these ensure additional benefits such as reduced land rents (e.g., in land tenure-related contracts).

Object of contract solutions -> the object of a contract is one or more AECPGs. Even though a contract solution could theoretically target any AECPG, it is commonly acknowledged that specific contracts are fitting or necessary for specific AECPG. For instance, collective approaches, such as water quality, are crucial for landscape-level AECPGs. Result-based contracts are useful for improving biodiversity or other AECPGs that require parcel-level practice adjustments. Value chain contracts are not linked to a specific AECPG. Nevertheless, these contracts are likely effective for AECPGs that attract consumers' interest (e.g., iconic species or ecosystem services such as potable water). Land-tenure contracts are effective for AECPGs that require long-term commitments.

Actors/parties involved -> the parties involved in a contract can be classified according to the institution involved. For instance, a typical agri-environmental

scheme involves a public institution (payer) and an individual (the farmer receiving the payment). Other forms of contracts where only private parties are involved attract a relevant interest, as in the case of many value-chain contracts. A further issue concerns whether the involved actors are individuals or collectives. That is relevant in collaborative and cooperative forms of contracts (cfr. Role of cooperation among farmers/actors). Finally, introducing an intermediary as an additional actor in a contract seems to be a relevant condition for success, particularly for implementing more articulated forms of contracts.

Information as a part of the scheme/role -> several inefficiencies attributed to agri-environmental schemes is linked to an information problem. We can distinguish between information asymmetries, where the land manager has more information than the payer concerning the costs and efficacy of environment-friendly practices, and information gaps, where local scale features affect the environmental effectiveness of different practices. Two main strategies have been proposed to cope with information gaps: i) monitoring programs and ii) spatial targeting. On the other hand, auctions and result-based contracts are proposed to tackle information asymmetry. Nevertheless, the periodic measurement of results entailed in the result-based approach is acknowledged to allow a long-term reduction of information gaps thanks to potential learning processes that could affect the farmers involved.

Monitoring and enforcement -> Monitoring and enforcement activities are necessary to ensure that farmers carry out the conservation measures for which they receive payments (Wätzold & Schwerdtner, 2005). Monitoring refers to surveying the implementation of measures farmers agreed upon when they committed to participating in a network project. Enforcement refers to procedures and sanctions that are applied in case of non-compliance. In this context, monitoring should not be confused with monitoring programs aimed at studying/assessing the environmental impact of a specific agri-environmental scheme.

Flexibility -> in general, flexibility concerns the possibility of customizing a contract to local/individual cases. The flexibility is relevant as it usually allows for an increase in the acceptability of a contract. For instance, the possibility of a farmer adopting a contractual framework to his farm situation increases the uptake of a scheme. On the other hand, the flexibility increases the transaction costs adding a bargaining process and potential trade-offs. Flexibility is also a core aspect of result-based contracts. Indeed, the philosophy of such contracts is based on giving the farmers complete freedom of choice (i.e., perfect flexibility) to reach the result of interest. The drawback of such flexibility is introducing a critical aspect connected to the risk of the farmers failing to achieve the result.

Public good -> in economics, a public good is non-rivalrous and non-excludable, whereas private goods are both excludable and rivalrous. Those aspects entail those public goods do not have a market of reference and are usually

underprovided. Nonetheless, *pure* environmental public goods responding to those conditions are not common. For instance, a landscape is a typical public good, but the non-rivalrous condition might be affected by overcrowding. Thus, possible cases are typically classified as club goods (non-rivalrous but excludable) and common goods (non-excludable but rivalrous).

Externality -> when an economic process generates a secondary (and usually unintended) impact affecting a third party. Externalities can be positive (benefits) or negative (costs). An environmental externality is significant for designing agri-environmental schemes as these are usually focused on reducing negative environmental externalities typically related to agricultural activities. In some cases, incentives are designed to facilitate the permanence of a positive externality (e.g., landscape conservation). Still, it is to notice that the incentive retribution is usually based on the cost of the action deemed necessary to avoid/facilitate the externality and not on the actual cost/benefit of the externality.

Value-chain contract approach -> the feature of this solution concerns the valorization of a specific food supply chain according to the public good(s) that is delivered by its components. Typically, information on public goods delivered by supplier farms is transferred all along the value chain up to the final consumers of the food product. The rationale of the approach is based on the competitive advantage attributed to the product and the firms (e.g., consumer trust) involved in the value chain. Example: water protection case study DE5.

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CONSOLE

CONTRACT Solutions for Effective and lasting delivery of agri-environmental-climate public goods by EU agriculture and forestry

Research and Innovation action: H2020 - GA 817949

Design Guide for Practitioners (Annex to D1.7: Final AECPG contractual framework and practical solutions catalogue)

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5	Ecorys Brussels NV.	BE
6	EUROPEAN LANDOWNERS' ORGANIZATION	BE
7	ASSOCIATION OF AGRI-ENVIRONMENTAL FARMERS	BG
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Table of contents

1	Summary	68
2	What is and how to use this guide	68
3	The broad picture.....	68
4	Contract features, contract types, and model contracts.....	69
4.1	Qualifying features for contract classification	69
4.2	Contract types.....	70
4.3	Model contracts.....	70
5	Step-by-step choice of contract types	73
6	Step-by-step design of specific contract types	74
6.1	Result-based contractual solutions.....	75
6.2	Collective contractual solutions	76
6.3	Value chain contractual solutions	77
6.4	Land-tenure contractual solutions.....	78
7	Further readings.....	79
8	Annex - List of potential options for key contract features	79
9	Glossary	81
	Acknowledgments	83

List of Figures

Fig 1: General framework for contract design.....	69
Fig 2 Potential combinations of selected contract features	70
Fig 3 Model contracts for the four types based on an individual contract feature	71
Fig 4 Model contracts for the most revealed hybrid types of contracts	72
Fig 5 Decision tree for contract types.....	73
Fig 6 Decision tree for designing results-based contracts.....	75
Fig 7 Decision tree for designing collective contracts	76
Fig 8 Decision tree for designing value chain contracts.....	77
Fig 9 Decision tree for designing land tenure contracts	78

1 Summary

The Annex to D1.7 – Design Guide for practitioners is a support document that illustrates the contract characteristics of the four innovative contracts defined by CONSOLE and their various hybrids. This document describes and tests model contracts through stakeholder workshops across different EU countries. This document also illustrates decision trees that will aid practitioners in choosing the appropriate contractual solution for the different agri-environmental objectives. In addition, the design guide also offers a glossary of terms used in the document.

2 What is and how to use this guide

This document is a guide for practitioners to support the design of solutions for the provision of agri-environmental-climate public goods (AECPGs) by agriculture and forestry. As a result of this, it focuses on voluntary contracts for farmers and foresters specifically focusing on: environmental prescriptions along land tenure contracts, result-based payments, provision of AECPGs in the form of collective arrangements between land managers, and value chain contracts involving different actors along a supply chain.

Based on task 1.3, especially D1.4, and benefiting from input from task 5.2 and task 4.6, the framework and catalogue have been refined and produced in the final version and all its components as D1.7 and as a design guide that acts as an annex to D1.7. This document is an updated version of the short design guide produced as an annex to D1.4, which illustrates and details innovative contractual solutions, model contracts, and decision trees that aid in choosing the correct contractual solutions. The short design guide of D1.4 was tested through stakeholder workshops in project member countries through Task 5.2, as explained in D5.5, to improve the model contracts and decision trees. The feedback from stakeholders was carefully evaluated and incorporated here. The previous illustrations were improved upon the advice of the stakeholders and the reviewers. The document was reviewed rigorously to make it accurate and responding to its potential implementation.

3 The broad picture

The design of contract solutions requires considering the broad picture of needs and design options. Design options are illustrated by the framework below (Fig 1), where decision-making about specific and general contract characteristics (AECPG contract features) is aimed at answering the need of a particular context (like specific system features). The framework intends to study how the contract solutions available for AECPG provision interact with the context and produce effects. The framework is cyclical and highlights the causal chain from factors behind contract design to its impact and then leads to the next round of contract design. The overall effect can be measured through environmental/ecosystem improvements over time and can be related to contract features and their performances.

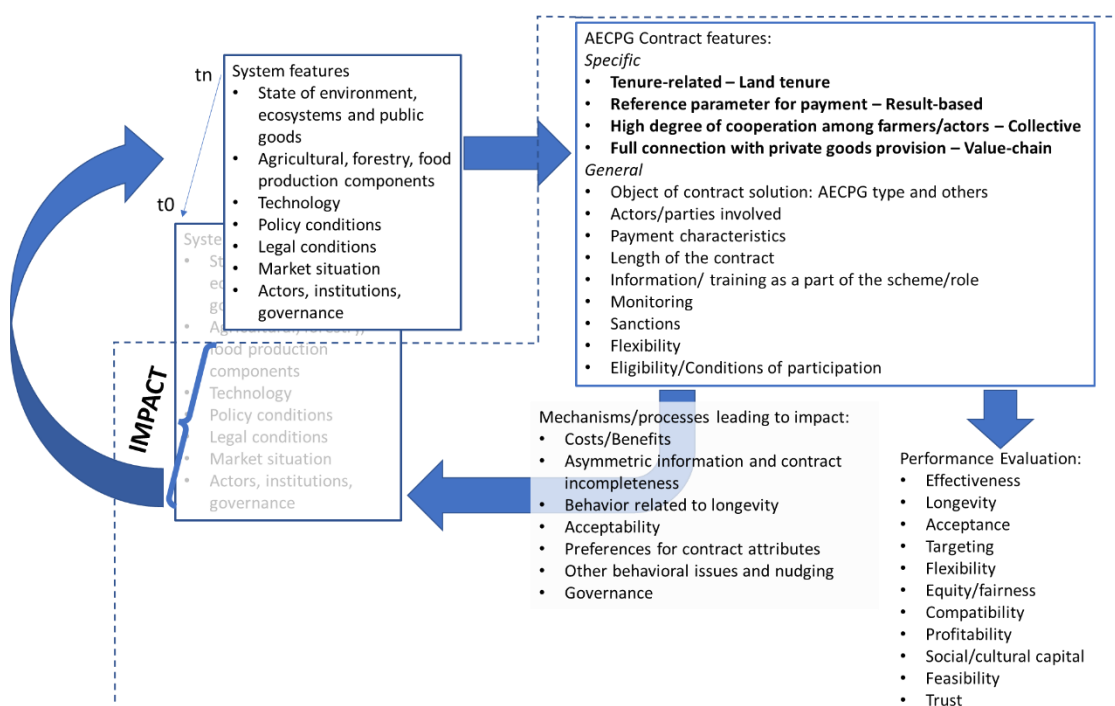


Fig 10: General framework for contract design

4 Contract features, contract types, and model contracts

4.1 Qualifying features for contract classification

We use four specific contract features highlighted in bold in the figure above (Fig 1) to identify contract types in this document. These features are the following:

1. **Environmental Objective as a Reference parameter for payment – (result-based contract solutions):** Result-based contracts connect payments to environmental effects or the amount of AECPGs provided (environmental outcomes and benefits). In result-oriented agreements, the payment may depend on a simplified measurement based on models or a point system linking a set of practices to expected outcomes. In the latter, the difference between result-based and action-based is more blurred.
2. **Cooperation among farmers/actors (collective contract solutions):** In a broad sense, collective contracts are where groups of farmers/foresters/landowners and other actors with a high degree of cooperation establish a formal entity and apply for an AECS agri-environmental scheme collectively. The payment for the activities undertaken to meet environmental objectives and enhance AECPGs is then made to the group in some cases and then shared with individual farmers. But different forms are possible; for instance, payments for the individual farmers can also adhere to a collective.

3. **Tenure-related environmental prescriptions (land tenure contract solutions):** Tenure-related environmental prescriptions under CONSOLE refer to those land leases or land contracts that include an environmental clause (e.g., the land tenure contract comes along with rent associated with environmental prescriptions)
4. **Connection with private goods provision (value-chain contracts):** Public goods are produced through targeted prescriptions included in contracts for producing agricultural/forestry goods. It implies that consumers have clear information about the product's connection with the public good and, therefore, (usually) accept to pay (more) for that added value.

4.2 Contract types

The four contract features above often occur in combinations generating "hybrid types." (See D2.3 and D2.4 - case study analysis for more details). Based on the different combinations, sixteen different contract types can be identified in Fig 2 below. Some combinations are particularly common and thus interesting, for example, hybrid forms between result-based and collective. However, the most suitable mix can only be evaluated depending on local needs.

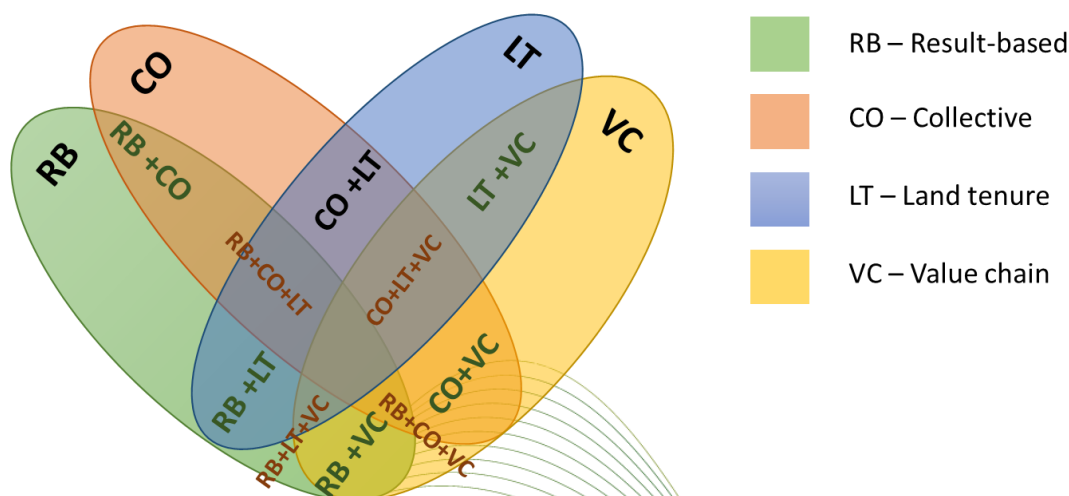


Fig 11 Potential combinations of selected contract features

4.3 Model contracts

We term "Model contracts" the combinations of features that can be considered a prototype (model) for each contract type based on the most frequent combinations of design features observed in practice. In theory, every kind of contract mix is possible, but we report the most frequently occurring combinations of features that can represent the models for these contractual solutions. We illustrate these most frequent qualifying features for the contract types and their hybrids in the figures below (Fig 3 and 4) (further explained in Annex in the end).

	RESULT BASED	COLLECTIVE	VALUE CHAIN	LAND TENURE
AECPG Type	Biodiversity; Climate regulation, water security	Water- related, resilience to natural hazards	Environmental benefits, quality, and security of products	Biodiversity & habitats, Landscape & scenery
Actors involved	Farmers, NGOs, market players, gov. bodies, consumers, banks, etc.	Farmers, landowners' association, govt & private bodies	Private companies, citizens or consumers, Non-profit organisations	NGOs, private, Government, Landowner associations etc
Payment type and characteristics	Emission certifications, Incentive payments, Payment for product	Compensation, incentive & product wise	Payment for brand, product, online donations	Paid by rate per area, length, or quantity, land lease
Length of contract and renewal	Short-term to long term, renewal	Short-term to long term, renewable	Long term, renewable	Medium- to long-term, renewable
Information, advisory, or training in scheme	Freely made available by public bodies, private experts, NGOs, etc.	Available within collectives or cooperatives	Provided for free by private actors	By land managers, project stakeholders, etc.
Funding	Public funding (incl. from international bodies) + private funding	Public (incl. from international bodies) and/or private funding	Private funding	Private funding; rarely public funding for communal land
Monitoring	Monitoring by public & private bodies	Monitored by government or private experts	Strict monitoring, by processors or private bodies	No controls or only self-monitoring by landowners
Sanctions	Non-compliance leads to termination or payment reduction	Non-compliance can lead to termination of contract	Non-compliance can lead to prohibition of the brand use	Non-compliance can lead to non-renewal
Flexibility	High degree of flexibility in management decisions	High flexibility to customize contracts, unless it is a hybrid.	Higher flexibility of contract rules, Lower flexibility for management practices and product quality	High flexibility, no strict conditions for participation
Conditions of participation	Have to achieve the environmental objectives of the contract	A minimum number of farmers need to participate	Conditions for using brand name & exclusivity	Some contracts require farmers to participate for fixed duration; early termination legally difficult

Fig 12 Model contracts for the four types based on an individual contract feature

	Value chain + Result-based	Collective + Result-based	Collective + Land tenure	Land tenure + Value chain	Value chain + Collective	Result-based + Land tenure + Collective	Result-based + Value chain+ Land tenure
AECPG Type	Biodiversity, landscape & scenery, product quality	Biodiversity, recreation, landscape & scenery soil & water quality	Biodiversity, landscape & scenery, cultural heritage, animal welfare	Landscape & scenery, soil quality, climate regulation	Climate regulation, biodiversity, water quality	Landscape & scenery, recreational, rural viability	Biodiversity, landscape & scenery, Soil & water quality, Climate regulation
Actors involved	local government, local businesses, farmers/ landowners	public bodies, government farmers	Govt, farmer/landowner associations, NGOs	Market actors, forest owners, municipalities, shareholders	landowner association, carbon market, investors	Forest owners, nature-based tourism enterprise	Govt, market sector, NGOs
Payment type and characteristics	Incentive + product price	Incentive, fee for label, subsidies,	Incentive, land lease	Emission certificates, carbon credits, etc.	Donations, investments	Profits from tourism	Product price, loan interest discounts, subsidy
Length of contract and renewal	Usually short contract duration (1 – 5 years)	Can be medium or long (5 years or more)	short-term (1 season, 1 year, etc.)	Fixed or permanent	Permanent	Flexible	Short contract duration or open ended
Information, advisory, or training in scheme	freely available, farmers may get money for training	Via stakeholders of the collective or hired farm advisors	Contracted NGOs and non-profits provide training	Provided for free by private actors	Provided for free by private actors or by farmer cooperatives	Free training and advisory provided	Freely available, or farmers may get money for training
Funding	Private funding	Public or Private funding	Public or Private funding	Private funding	Private funding	Public or private funding	Public or private funding
Monitoring	Strict monitoring using indicators	By financing bodies, farm advisors or self	Partial monitoring by external actors or self-monitoring	annual third-party audits & internal monitoring	Self-monitoring	No monitoring, contract is based on trust	Strict monitoring using indicators
Sanctions	Suspension or termination of contract on non-compliance	Non-payment for non-compliance	Non-compliance can lead to termination or non-renewal	Non-compliance can lead to non-renewal and termination of brand use	Non-compliance can lead to prohibition of brand use or suspension of contract	Non-compliance can lead to termination of contract	Suspension or termination of contract on non-compliance
Flexibility	Farmers can choose their farm management conditions	Farmers cannot enter other contracts	High flexibility	Flexibility to choose management practices	Low flexibility in terms of product quality	Flexibility of choosing contract duration and renewal	Farmers can choose their farm management conditions
Conditions of participation	High product quality is an important condition	All stakeholders must agree to the contract conditions	Area contract is pre-determined by financing parties	Should already have FSC certificate or another green label	Landowners should collectively agree to contract measures	Limited resources available while entering the contracts	High product quality an important condition

Fig 13 Model contracts for the most revealed hybrid types of contracts

5 Step-by-step choice of contract types

Deciding upon the appropriate contract type depends on some essential steps. Usually, practice-based contracts, also known as action-based contracts, are the most common form of contract with well-defined management prescriptions targeting the single farmer or forester. So, this section aims to explain the newly defined contractual solutions further, so it is easier for different practitioners to choose different contract types. Each step poses critical questions that need to be answered before selecting the suitable contract type. These are:

A. Targeted public good(s): What are the public goods/ ecosystem services/ environmental and climate objectives? What are the expected ecological achievements?

B. Decision context: What are the different instruments and contractual solutions available for achieving the objectives?

C. Technical feasibility: Availability of expertise and training and development staff? Scale?

D. Actors involved: Stakeholder involvement and motivations? Farming community reaction?

E. Funding: Sources of funding? Calculation of the payments? Administrative support?

F. Other factors: Cost-effectiveness. Market Preferences.

G. Legal framework: Factors for implementation (like environmental legislation and CAP)? Mandatory requirements?

The flowchart below (Fig 5) illustrates the essential steps to evaluate while choosing a contract type. One of the critical steps in the implementation of innovative contract types is to detect if the new contract type is a better option or not compared with what is in place.

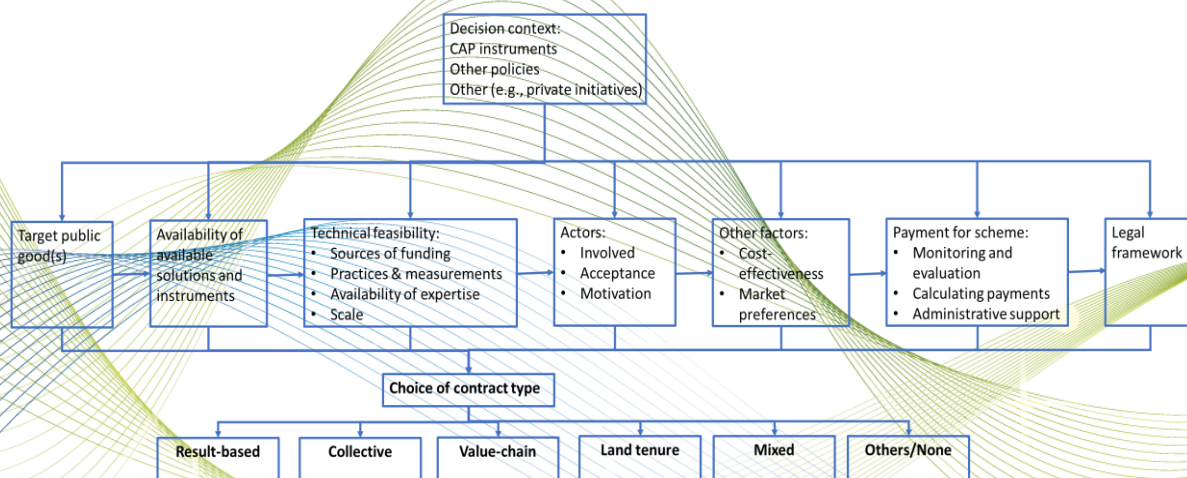


Fig 14 Decision tree for contract types

6 Step-by-step design of specific contract types

Below, we illustrate decision trees for the four main contract types identified above. All decision trees are organized around three main aspects: decision in principle, feasibility, and target group. Decisions, in principle, are, for instance, the definition of clear objectives for the AES and understanding what contract features best suit the regions' spatial, socio-economic, and political settings. The feasibility of the contract solutions is considered in terms of funding and expertise. Finally, the target group implies discussing the design with stakeholders and understanding their attitudes toward the contract types. Core differences among the four contract types are the type of actors involved, funding sources that could be present, and the mechanisms for payment. These choices could have implications for many other contract design parameters that must be consistently chosen.

The decision trees should be interpreted as a simplified and stylized checklist to support practitioners considering contracts' design. Nevertheless, many questions do not have a clear-cut "Yes" or "No" answer in the real world. Moreover, each contract type may require additional aspects to be considered to understand its suitability in a given context (like other features of model contracts).

6.1 Result-based contractual solutions

For result-based payments, it is necessary first to identify the availability, source, and type of funding and check if this contract type can comply with funding rules – exceptionally if it is foreseen to use CAP funding. Then the availability of knowledge, skills, and institutional capacity must be considered as the identification of suitable indicators and sound monitoring are essential for success. It is crucial to assess whether the target farmers' expected response and uptake will be sufficient to achieve the environmental objectives and, if relevant, whether farmers will cooperate with other stakeholders to define and measure the result indicators. It is also important to consider how to pay for the objectives achieved. When designing result-based contracts, the decision tree flowchart could be used as a support (Fig 6).

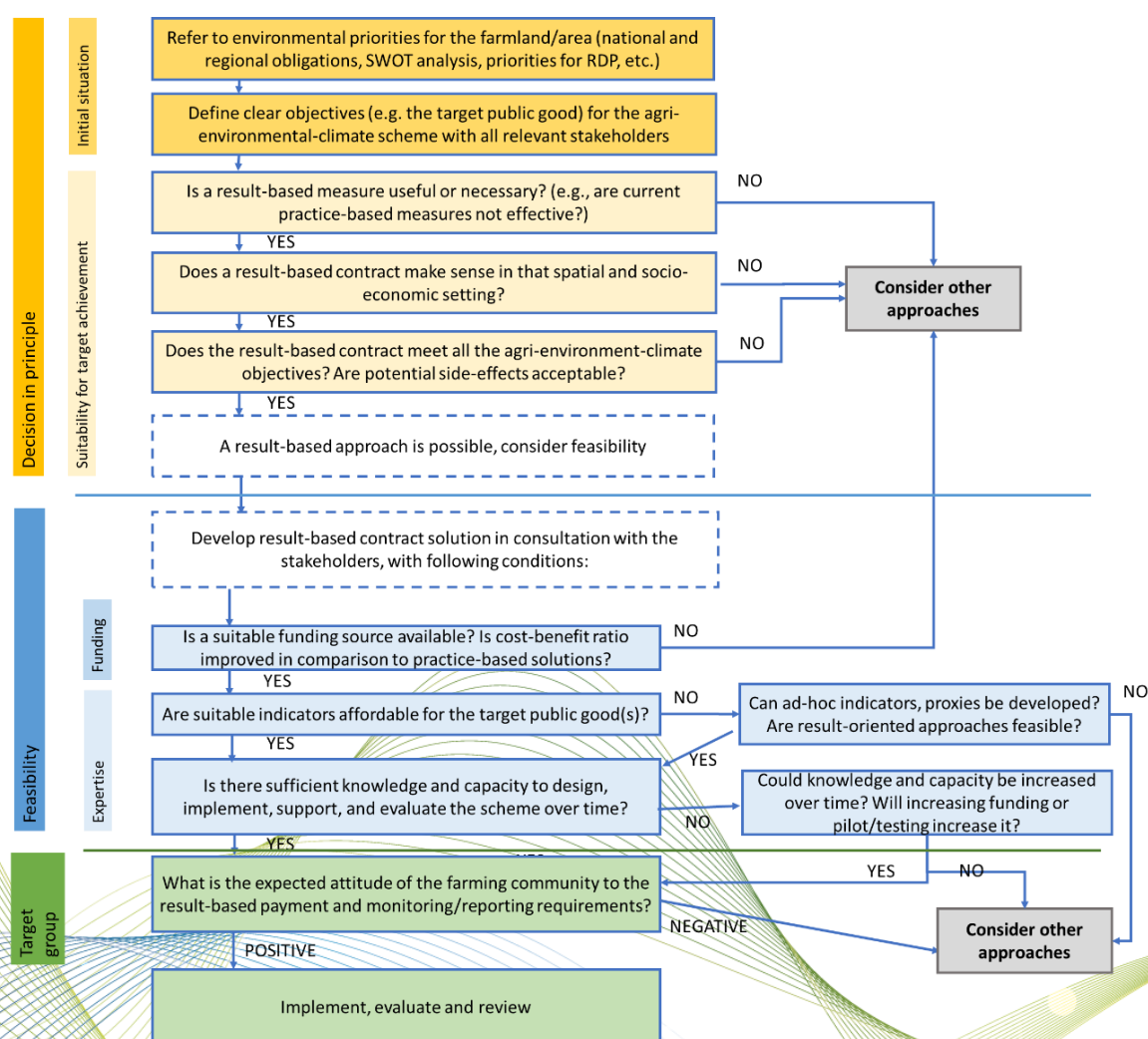


Fig 15 Decision tree for designing results-based contracts

6.2 Collective contractual solutions

A vital design step is the identification of actors willing and capable of supporting the implementation of a collective contract, especially associations of farmers, foresters, and environmental organizations. Studies show that farmers are not always well-disposed toward cooperative and collaborative features like collective payments or collective decision-making. So, it is essential to consider the feasibility of a collective contract and provide the practitioners with the flexibility to evaluate local needs and modify the relevant design. The decision tree mainly includes a loop for decision-making and flexibility before designing a collective scheme as shown in Fig 7 below.

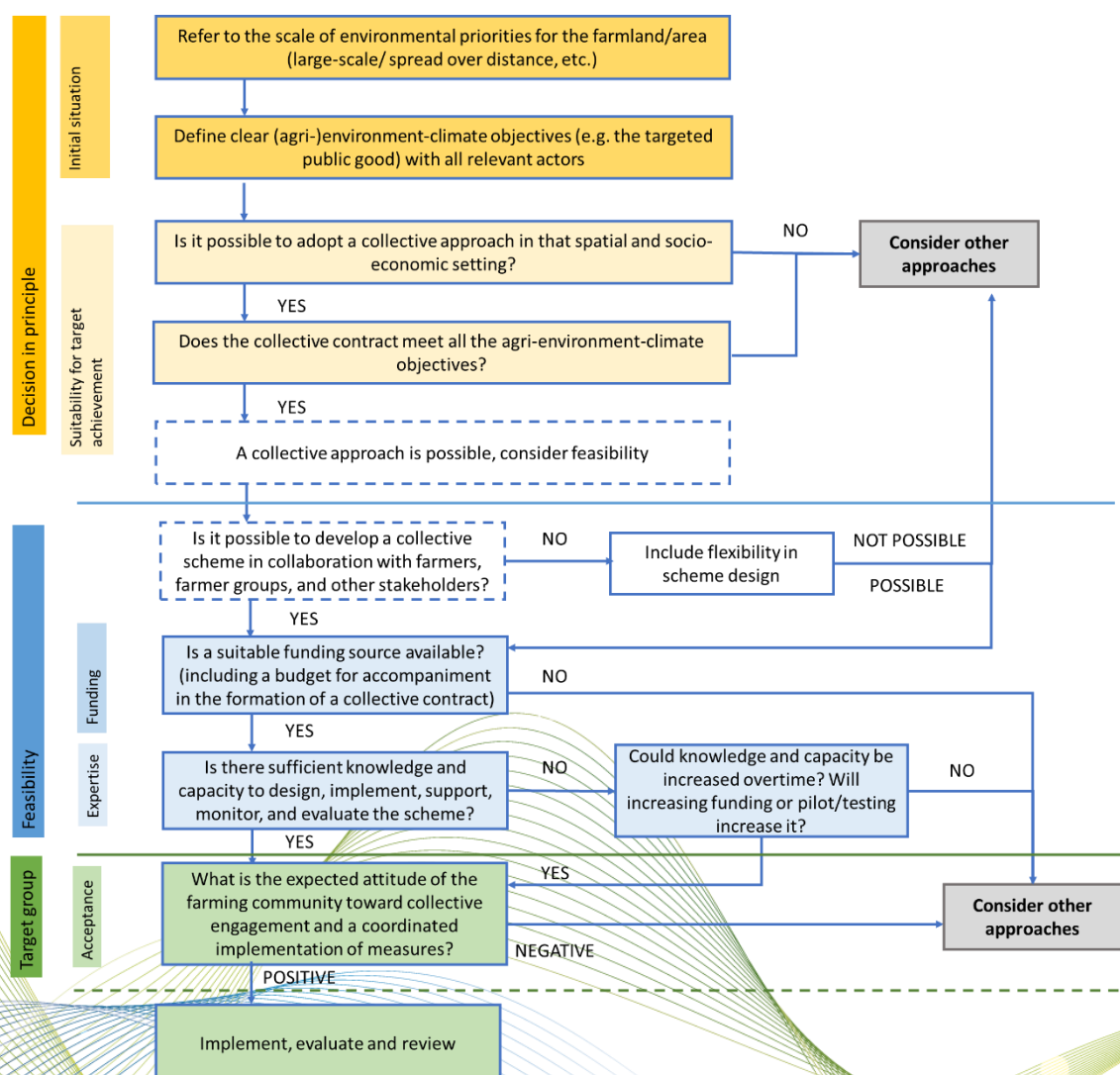


Fig 16 Decision tree for designing collective contracts

6.3 Value chain contractual solutions

In the value chain contracts type, the farmers are paid in exchange for having to respect environmental prescriptions attached to a contract to provide a private good. Assuming consumers are willing to pay for the public good when purchasing the private good, farmers usually receive premium prices. So, the roles of the market, market players, and buyers/consumers are important in designing a value-chain contract. Thus, before choosing to develop and engage in a value chain contract, it is critical to check the market conditions and product requirements and then match them to the environmental objectives intended to be met with the product. If value chain contracts are at the risk of being unsuccessful, e.g. market conditions are unsuitable, or if the required environmental objectives cannot be achieved on acceptable financial terms, the practitioners should consider using other contractual solutions. The value chain mechanism might not be enough to compensate for the efforts needed, so it should be deemed to have public funding or be regulated by public support. E.g., value chain contracts for having local foods (organic certified) are not always only regulated by payments but also by public support and facilitation. To design efficient value chain contracts, the decision tree in Fig 8 below can be of help.

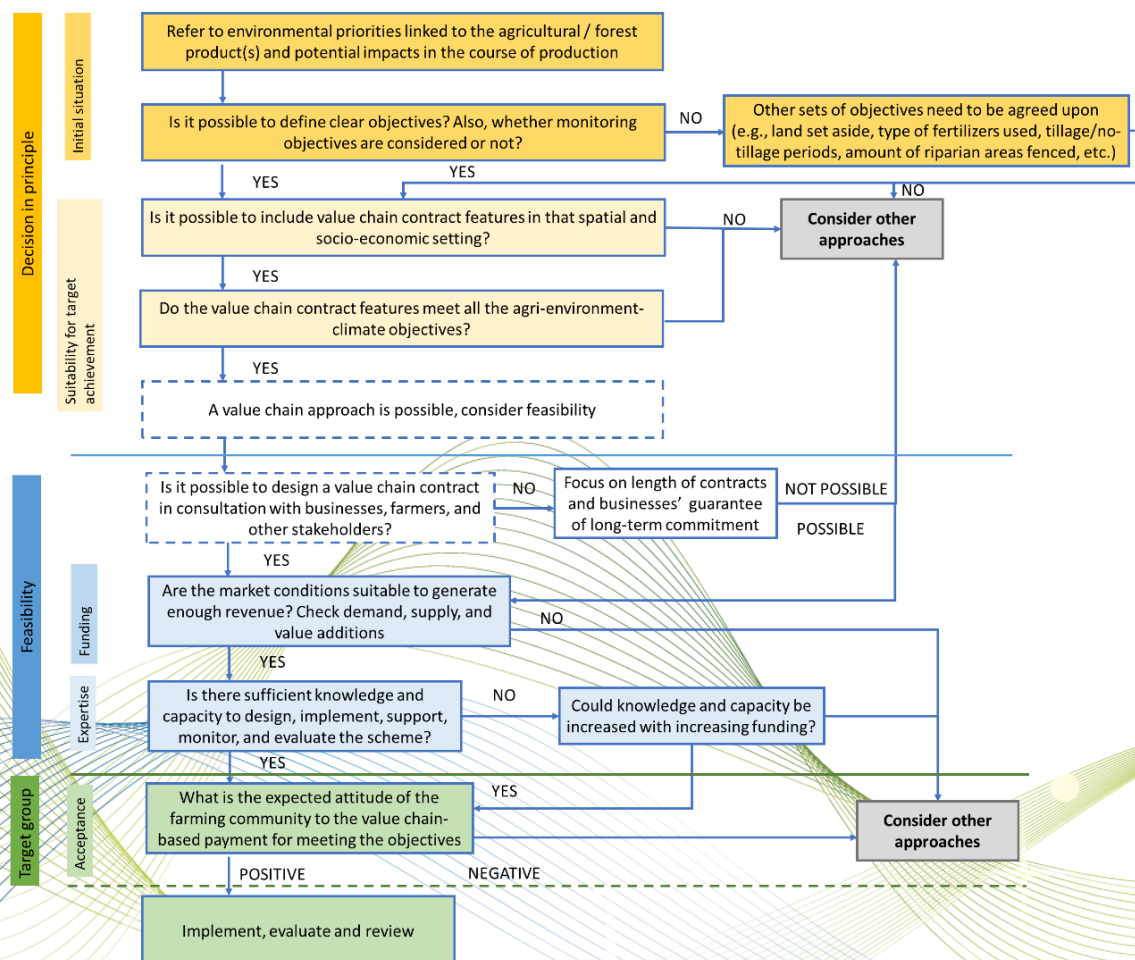


Fig 17 Decision tree for designing value chain contracts

6.4 Land-tenure contractual solutions

Engaging with landowners as primary stakeholders is important in designing land tenure contract solutions with environmental prescriptions. It is important that landowners (e.g., public owners, etc.) are willing to engage with tenants to support environmental management practices on their land. Land tenure-related contracts that provide public goods are also strongly determined by the legal framework for leases, which differ considerably across the EU / Europe. The decision tree is illustrated below (Fig 9).

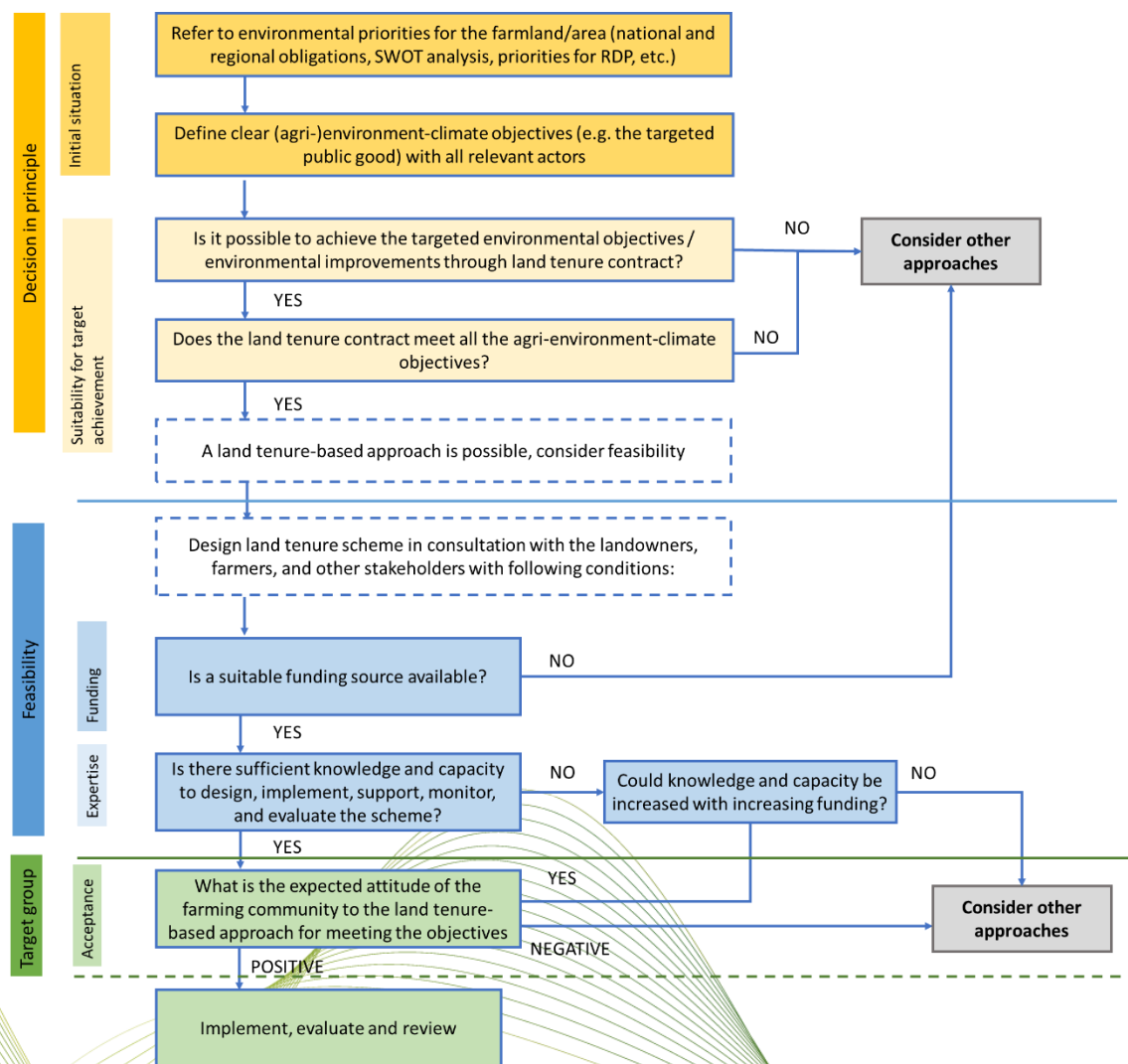


Fig 18 Decision tree for designing land tenure contracts

During a workshop for the on-the-ground testing of the decision trees, a group of practitioners identified a list of additional questions relevant to land tenure contracts. The list is reported below as an example.

Decisions in principle:

- What is the state of the landscape?

- What is the situation with biodiversity (or other AECPGs)?
- What is the cause of this state? Is quantification of the target desired/required?
- Which actors have already entered into a relationship - institutional and/or private landowners?
- What kind of leases (and sub-leases, if any) are in place?

Feasibility:

- How significant is the amount of lease income?
- Which actors have what room for maneuver?
- Do those involved have enough time to become familiar with each other?
- What is the impact of a particular measure?
- Has a reality check been carried out on the intended goals?
- Is there the possibility of accompanying (measure) advice?
- Is there (additional) funding for this?

Target group:

- Is there the will to talk together?
- Is the landowner willing to make a long-term and continuous commitment?

7 Further readings

1. D1.1 – Preliminary framework
2. D1.4 – Draft framework and short design guide
3. D1.7 – Final AECPG contractual framework and practical solutions catalogue
4. D2.6 – Catalogue of updated factsheets (with 61 case studies)
5. D2.2 - Draft report on experiences from outside the EU
6. D2.3 – Report on European in-depth case studies
7. D2.4 – Report on WP2 lessons learned

8 Annex - List of potential options for key contract features

1. Actors/parties involved
 - Farmers
 - Farmers' association(s)
 - Landowners' organization(s)
 - Civil society - Non-profit organizations
 - Civil society - non-governmental organizations
 - Civil society – Community organizations
 - Civil society – Cooperatives
 - Government (state / regional / municipalities)
 - Private companies/ market players (buyers, processors, retailers, etc.)
 - Private associations
 - Animal welfare organizations/ veterinarians

- Researchers / universities/ research institutes/ students / project teams
 - Citizens/ consumers
 - Shareholders
 - Banks (private or public)
2. Payment characteristics
- Compensation payments/ incentives to be paid, e.g., per area, length, or quantity
 - Subsidies and tax benefits
 - Non-tradable emission certifications
 - Tradable emission certificates
 - Payments for label or brand
 - Conditional bonus payments (like vouchers/ one-time bonus/ etc.)
 - Payment for product
 - Land lease
 - Donations (including online) for conservation/ crowdsourcing
 - Combinations, e.g., incentive payments and product price
3. Object of contract solution: AECPG type and others
- Biodiversity
 - Soil health/quality
 - Water quality and quantity
 - Climate regulation (carbon sequestration and/or GHG emission reduction)
 - Enhancement of the resilience to natural hazards
 - Quality and security of products
 - Landscape& scenery
4. Contract length
- Long-term- above 10 years
 - Medium-term- 5 to 10 years
 - Short-term- 1 to 5 years
 - Flexible
 - Fixed
5. Monitoring
- Private bodies hired by the market actors or by market actors themselves
 - Private bodies hired by the government
 - Public bodies
 - Certification organizations
 - NGOs and non-profits
 - Private experts
 - Self-monitoring
 - No controls
 - Monitoring of (key) indicators
 - Monitoring for product category regulation

- Monitoring of farm performance (annually)
 - Model deployment
 - Point system
6. Enforcement and sanctions
- Reduction of payments in case of non-compliance
 - Termination of contract
 - Non-renewal of contract in case of non-compliance
 - Sanctioning based on control criteria or selected indicators
7. Flexibility
- High flexibility for management practices
 - Flexibility to choose contract duration or to decide about termination
 - Flexibility over areas to enroll
 - Flexibility to enter other contracts
 - A fixed duration of participation
8. Information as a part of the contract solution
- Advice & training by a public body
 - Advice & training by private bodies
 - Advice and training by experts
 - Advice and training by NGOs/ non-profits
 - Free advice participants
 - Grant money for advice and training
9. Eligibility/ conditions for participation
- No special conditions
 - Limitations for using the brand name/labeling
 - Farmers/ stakeholders should have a consensus over measures
 - Agreement on environmental targets and action plan beforehand
 - Not participating in other AES with the exact requirements (prohibition of double funding)
 - Minimum number of farmers need to participate
 - Organic certification of enrolled farms

9 Glossary

The glossary provides definitions of terms and concepts included in the CONSOLE Project, particularly for the conceptual framework. Below is the non-academic version of the glossary, which is meant to communicate the core concepts and definitions of the project in a straightforward language for practitioners. The academic version of the glossary is available with the long version of D1.7, which is available on the CONSOLE website and is open to access.

Tenure-related -> Tenure-related contracts involve environmental clauses affecting the property and land-use rights on the land. For instance, grazing rights on communal lands are granted to farmers conditional to specific herd/flock

management or landowners that rent at reduced fees to achieve an environmental target (e.g., Forest bank case study F11).

Reference-parameter for payment -> a variable (e.g., number of birds, hectares under a prescribed practice, etc.) on which the payment of an agri-environmental scheme is linked. Result-based schemes are characterized by a payment calibrated to a result parameter like higher species density, soil organic matter, etc. The parameter for the calculation of the payment can also originate from models or calculated in a point-system: In that case, the farmer can select across a range of practices, and on that base, the farmer's environmental performance is assessed.

Role of cooperation among farmers/actors -> two or more farmers/actors working together towards the achievement of a common goal identifies cooperation or collaboration. Cooperation is usually structured as a single entity represented by an intermediary that acts as the liaison with the paying agency to manage controversies and the distribution of the payment to the community. Collaboration features a group of members that agree to a plan of activities related to specific practices to achieve an environmental goal. However, no formal hierarchical structure exists; each member is individually responsible for the paying agency. Such forms of collaboration can also be defined as "networks."

Contract and length of contract -> a contract is a formal agreement signed between two or more parties. Contracts are defined/qualified by different features arranged in combinations that outline several alternatives. The length of a contract is an important feature for the achievement of environmental goals. Indeed, longer contracts are usually required to reach various environmental and climate targets.

Actors/parties involved -> the parties involved in a contract can be classified according to the institution involved. For instance, a typical form of the agri-environmental scheme involves a public institution (payer) and an individual (the farmer receiving the payment). Other forms of contracts where only private parties are involved attract a relevant interest, as in the case of many value-chain contracts. Intermediaries can also be part of a contract that can facilitate the development of more articulated forms of contracts.

Monitoring and enforcement -> Monitoring and enforcement activities are necessary to ensure that farmers carry out the conservation measures for which they receive payments. Monitoring refers to checking compliance with the clauses in a contract. Monitoring can also refer to programs aimed at studying/assessing the environmental impact of a specific agri-environmental scheme. Enforcement refers to procedures and sanctions that are applied in case of non-compliance.

Flexibility -> in general, flexibility concerns the possibility of customizing a contract to local/individual cases; for instance, a farmer can adapt a contract to his farm. Flexibility increases the acceptability of contracts but adds bargaining processes and potential trade-offs. Flexibility is also a core aspect of

result-based contracts. Indeed, the philosophy of such contracts is based on leaving the farmers complete freedom of choice to reach the result of interest.

Public good -> in economics, a public good is non-rivalrous and non-excludable. Non-rivalrous means that a good can be “used” by multiple individuals. Non-excludable means that it is not possible to exclude someone from “using” that good. An example is a natural landscape: it can be enjoyed by multiple individuals that cannot be excluded from enjoying it. Nonetheless, *pure* environmental public goods responding to those conditions are not common. For instance, a seascape is a public good where the non-rivalrous condition might be affected by overcrowding. Access to a natural park can be regulated so that it is not non-excludable. Thus, different possible cases exist that are classified as club goods (non-rivalrous but excludable) and common goods (non-excludable but rivalrous).

Externality -> An economical process generating a secondary (and usually unintended) impact affecting a third party is an externality. Externalities can be positive (benefits) or negative (costs). The concept of environmental externality is particularly important for the design of agri-environmental schemes as these are usually focused on reducing negative environmental externalities typically related to agricultural activities such as water pollution, biodiversity depletion, etc.

Value-chain contract -> the feature of this solution concerns the valorization of a specific food supply chain according to the public good(s) that is delivered by its components. Typically, information on public goods delivered by supplier farms is transferred all along with the value chain up to the final consumers of the food product by means, for instance, of a brand. The rationale of the contract is based on the competitive advantage attributed to the product and the firms (e.g., consumer trust) involved in the value chain.

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