



CONSOLE

CONtract **SOL**utions for **E**ffective and lasting delivery of agri-environmental-climate public goods by EU agriculture and forestry

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Deliverable D2.2

Catalogue of case studies beyond CONSOLE

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1 Summary

The aim of task 2.3 is to collect the most promising and successful experiences outside the EU that could add new and interesting perspectives for application in EU and to feed into WP2 a wider range of opportunities for contract design. The task takes the form of a systematic literature review and this report provides a draft version of the outcomes of this review. The final version of the report will be provided in month 30.

The review selected 79 documents, including both peer review papers and reports/grey literature having as a scope all countries outside those already represented by the CONSOLE partners.

The main reasons for success identified for the reviewed cases are: a) reducing risks linked to results; b) reduced costs for monitoring results; c) farmers' interest and social revenue; d) resources availability; e) additionality; f) relying on existing collectives; g) communication; payment setting; h) appropriate intermediaries.

To a large extent the success factors listed above confirm insights from cases in the CONSOLE partner countries. However, they allow the consideration of a broader variety of solutions. On the other hand, this also depends on the specific institutional context where they are located, which means that potential for replication should be taken carefully.

The fact that a large part of the experiences and certainly of the evidence is rather recent encourages the continuation of this task providing updates during the whole project life.

2 Introduction

2.1 Scope of task 2.3

According to the CONSOLE scope (cfr. D1.1), the case studies focused in task 2.3 are contracts intended as 'actions related to the provision of public goods using contract-based categories and conceptual interpretations (e.g. in economics of contracts), but it is not bound to consider only what is legally considered as a contract; the scope is actually better defined by solutions'. More specifically, the literature (scientific and 'grey' literature) targeted in task 2.3 addresses voluntary contracts addressing solutions for the provision of agri-environmental and climate public goods (AECPGs) featuring one or more of the following approaches: land-tenure related provisions, collective agreements, result-based payments, value chain contracts/solutions . Accordingly, regulations are not considered in this document.

Definition of contracts targeted by CONSOLE (cfr. Deliverable D2.4):

- Result-based/result-oriented contracts: Contracts with a clear environmental result as reference parameter. Achieving the result is considered both as the reference for modulating the payment or as a condition upon which the payment is granted. Therefore, this contract type entails a form of monitoring of the results.
- Collective implementation/cooperation: Contracts implementing or relying on an existing formalised cooperation among farmers/actors in view of delivering AECPGs. The payment can be issued collectively (collective solutions *sensu stricto*) or distributed directly to the members of the collective.
- Value chain-based contracts: Contracts focusing on the production of a specific private good (e.g. food) that is directly or indirectly linked to the delivery of AECPGs. That is for instance the case of traditional products (promoting e.g. cultural services-related public goods) and organic food (entailing less harmful practices for biodiversity).
- Land tenure-based contracts: Contracts including land tenure arrangements with environmental clauses.

According to a "traditional" categorisation of policies, task 2.3 will focus on 'carrots' type instruments. The contract solutions focused by task 2.3 can also be categorised in the wider context of payments for ecosystem services (PES) schemes defined by Wunder (2007) as "voluntary, conditional agreement between at least one 'seller' and one 'buyer' over a well-defined environmental service or a land-use presumed to produce that service". However, a range of transversal contract solutions that include or are expected to affect different issues are also envisaged. For instance, aspects dealing with the enhancement

of “human capital” such as awareness and/or knowledge of environmental services are a transversal and indirect effect of policies on which a growing attention in (mainly scientific) literature is present. Such attention is mainly devoted as the EU AECPGs schemes are generally considered weak in that respect (cfr. §3). Furthermore, documents providing a critical analysis of existing case studies useful for the identification of improved solutions will be included even though not directly related to the four contract approaches mentioned above.

2.2 Objectives

According to the objective of the deliverable D2.2. “Catalogue of factsheets of case studies from outside the EU” the aims of the present document were intended to provide a collection of factsheets illustrating a range of case studies outside the EU and present them in a standard and structured format.

Aim of task 2.3 were therefore to collect the most promising and successful experiences outside the EU. In principal, the analysis should have been executed similarly to task 2.2 and focused on case studies, but mainly based on: literature evaluation, a written survey by selected international experts and some very specific short studies executed by partners in the respective countries.

Main countries expected to be included were those where national agri-environmental policies are implemented since decades as in the EU (e.g. Australia, USA and Canada), but further examples from other countries were also envisaged. Support in the selected countries was also sought through subcontracting In order to achieve that objective.

Revised objectives of task 2.3 in the wider context of WP2

The CONSOLE Project strategy is to analyse the different aspects of contractual options for the lasting delivery of AECPGs by EU agriculture and forestry. WP2 aims at a structured analysis of existing agri-environmental contract solutions for supporting an improved provision of AECPGs by EU agriculture and forestry. The WP is based on a comprehensive inventory of existing contracts and the development of a diagnostics framework. The diagnostics framework includes the necessary data related to the contract inventory with the specification of design features and assessment criteria. Task 2.2 together with task 2.3 have the goal to provide the inventory of existing and innovative contract solutions to outline a wide as possible range of successful contract solutions in EU (task 2.2) and beyond (task 2.3). Similarly to task 2.2, task 2.3 is based on case studies to

provide a catalogue of features and conditions of success (or failure) for different agri-environmental contracts. The analysis of the contract solutions provided by WP2 will give an overview of key-lessons and innovative solutions to improve the design of contracts for the delivering of AECPGs. Learning from the experiences of existing solutions identifies potential areas for improvement to be considered during the project and feed back into WP1. Also, the in-depth analysis forms the basis for further quantitative analysis in WP3 and WP4. Finally, WP2 will achieve key lessons and summarize the results, in order to give an overview for policy makers on innovative and successful solutions "outside the box".

To optimise the usefulness of task 2.3 for the Project, the task objectives have been revised: After initial attempts to replicate the activities carried out in 2.2 also in selected cases outside the EU, it was decided to rather focus the efforts on a systematic literature review including European case studies if not targeted by the CONSOLE Consortium and if such case studies can provide useful insights for the subsequent activities of the Project. The task will also revise failed experiences to provide valuable insights on the potential pitfalls of AECPGs tools. The aim is to build a catalogue of experiences from different contexts and that could add new and interesting perspectives for application in EU and to feed into WP2 a wider range of opportunities for contract design. To notice finally, that task 2.3 includes the review of scientific literature but it is also specifically focusing on the collection of available grey literature such as reports, good practice manuals, project evaluations, etc.

The change in objectives is part of a pending amendment at the time of submission of the deliverable. The new proposed description of task 2.3 is as follows:

Task 2.3 Analysis of successful experiences outside Europe (M4-M30)

Leader: UNIBO; Contributors: BOKU, LUKE, TRAME

Aim of task 2.3 is to collect the most promising and successful experiences outside the EU that could add new and interesting perspectives for application in EU and to feed into WP2 a wider range of opportunities for contract design. Activities will take the form of a systematic literature review. The task includes the review of scientific literature but it is also specifically focusing on the collection of available grey literature such as reports, good practice manuals, project evaluations, etc. The aim is to build a catalogue of experiences from different contexts and Main countries to be included are Australia, USA, Canada, but further examples from other countries are envisaged. The review will also include interesting European case studies if not targeted by the CONSOLE Consortium and if such case studies can provide a more complete view of the issue. The systematic review will accompany the work along the project life, with a draft report in month 15 and final one in month 30.

D2.2 Draft report on experiences from outside the EU (M15)

Draft report illustrating the case studies carried outside the EU, presented as much as possible in a standard and structured format (T2.3)

2.3 Outline

The D2.2 is organised as follows: after the introductory section (section 2), a general background (section 3) is provided. The presentation of the search approach to retrieve the case studies and select the best fitting to the objectives of task 2.3 is presented in section 4 and the catalogue of the case studies is presented with their brief description in section 5. This latter section is organised as a “living document” with the case study database presented as an appendix to the document. The table will be updated whenever new interesting case studies for the CONSOLE Project are found. Finally, section 6 will discuss more in detail the most interesting case studies and provides lessons learned resume. Section 7 concludes the deliverable providing some general lessons to feed into D2.4.

3 Contract solutions for AECPGs: review of most critical aspects

The provision of public goods from private lands depends on the resource use decisions of the land-holders and -managers. Markets work relatively well for goods that benefit those who make management decisions. That is the case of food production for instance from agricultural lands. However, public goods flows affect the society at large and therefore the private market mechanisms generate the so called 'externality problem' (Jack et al., 2018). Agri-environmental schemes (AES) include a range of instruments to re-balance the tendency of ecosystem managers to provide too little of public goods. Since 1992, reforms of the CAP have included several AES tools to mitigate the environmental impact of European agriculture (Science for Environment Policy, 2017). The General Agreement on Tariffs and Trade (GATT) have effectively enabled the implementation of AES and regulated the limitation of compensations to costs of compliance incurred (i.e. income foregone or costs incurred) (Burton and Schwartz, 2013). The dominant framework of AES regards a uniform payment for farmers. The payment is conditional to the uptake of a set of actions considered able to reduce the provision of negative externalities or improve positive externalities (Hanley et al., 2012). Such payment schemes are relatively simple to implement, do not necessitate complicate monitoring and do not incur in inequalities concerns (as the same price is offered to farmers for undertaking a given action). Nonetheless, such schemes incur in "economic problems", as they typically over-reward "all but the marginal producer" (Hanley et al., 2012). That effect is linked to the actual provision of public goods from agri-ecosystems which is affected by spatial variation of opportunity costs and information asymmetries between 'seller' and 'buyer' of public goods. It has also been noted that such payment approach is dominant because there is no credible alternatives (Burton and Schwartz, 2013). Considering "policy indicators" such as acceptance and uptake, 'action-oriented' are indeed successful (Herzog et al., 2005). But a range of concerns are raised on the real effectiveness of CAP and its AES schemes for the provision of public goods such as biodiversity among others (e.g. Pe'er et al., 2014). One of the most critical aspect concerns the unsatisfactory assessment of additional effects of AES programmes (Daniels et al. 2010). Therefore in 2010 the ENRD and EC reported a "fairly widely held view that the tools to maintain and enhance the environment should be more clearly results oriented" and also (COM(2010) 672) the "paramount importance" of developing new, more cost-effective approaches.

AES are adaptive and can be revised and improved according to changing priorities and to improve their efficiency (Science for Environment Policy, 2017). Some aspects where AES should be improved regards: i) Environmental

effectiveness that is heterogeneous across EU (Beckmann et al. 2009; Kleijn and Sutherland, 2003); ii) Adverse selection effects that drives the uptake of least management adaptation and diverted on less productive areas (Burton and Schwartz, 2013) and long term behavior concerns that involve the shift of farmers' choice and their intrinsic motivations. Beyond their design, the effectiveness and efficiency of AES also depend on "human capital" (WBAE, 2019). This includes farmers' knowledge of the environment, participation or willingness to embark in networking and collaboration, and also the question of the extent to which farmers are sensitive to agri-environment-climate-related issues. However, it is not yet fully clear what factors and contract solutions contribute to overcoming such problems of payments for AECPGs (Grima et al., 2016, Romulo et al., 2018). An essential condition for ensuring permanent environmental improvements is to link farmers' uptake to a major attitudinal shift (Morris and Potter 1995; Beedell and Rehman 2000; Wilson and Buller 2001, Burton Kuczera and Schwarz 2008). The action oriented scheme featuring current AES, entails however that farmers' adoption depends mainly on commercial interests and often on a limited need of practice adaptation (Harrison et al. 1998; Wilson and Hart 2000; Schmitzberger et al. 2005). Therefore, human capital shifts are a clear weaknesses of dominant AES schemes. That aspect is therefore to be considered in task 2.3 to find evidence of experiences able to improve the issue.

Jack et al., (2018) identify context dynamics, environmental, socio-economic and political context-related lessons to improve the design of incentive-based mechanisms. These include:

- The need of tailoring more elaborated schemes when marginal benefit of service provision is not constant. That includes for instance the building up of collectives accounting for different configurations of participants to be environmentally effective.
- The necessity of measuring the environmental effects of a policy and therefore the need of appropriate proxies relating to the ecosystem functions of concern. Also, proxy used to monitor is relevant as it can favour strategic behaviours (Matzdorf).
- All else being equal, contracting and monitoring are cheaper when the number of agents is small. That regards for instance collective agreements and the advantages of embedding result based in collective-related schemes.
- The relevance of well functioning institutions to achieve better results and the need of intermediaries to partially compensate where such institutions are not in place.
- Incentives promoting innovation are generally more cost-effective in the long-run as adoption of new green technologies or innovative agroecological practices will lower the cost of protecting the environment.

Given these range of challenges, several improvements are streamlined in literature suggesting and elaborating on new forms of contract solutions. Among these, it is worth mentioning (Hanley et al., 2012; White):

- Paying for outcomes not actions;
- Determining optimal contract length;
- Devising incentives for spatial coordination such as top-up bonuses when neighbours participate to the same scheme or spatially connected auctions which give greater weight to bids which are spatially adjacent to each other;
- Focus on contract set-up that reduces transactions costs such as search, negotiation, and administrative costs (Mettepenningen et al., 2009).
- The consideration of reasons for AES uptake beyond profit maximization as other motivations are also important (e.g. cultural aspects, Burton 2008).

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4 Case study search and setting-up of the database

As described in the CONSOLE Project DOA, task 2.3 is based on case studies. According to D1.1, a case study is intended as a case of real implementation of a specific contract solution (limited to contracts consistent with the scope above) in an area or region. It can involve several participating actors and farms, and several individual cases of implementation of the same contract; for the purposes of covering failures, it can also include real life proposals of contract solutions that for some reasons have never arrived at the stage of generating impact, but that can provide insights from their story, e.g. measures that opened calls without participation; contract proposals with no uptake, etc.

The search of case studies fitting to the task objectives started reviewing scientific literature by means of search engines such as SCOPUS or WOS. The aim was however to enlarge the range of case studies by focusing on available grey literature such as reports, good practice manuals, project evaluations, etc. able to identify existing experiences and potential innovative solutions.

The focus on grey literature allowed to include case studies that might be not the target of research for different reasons but able nonetheless to offer examples of good practices and provide lessons from the real world. On the other hand, the inclusion of scientific literature allowed the inclusion of potential innovative solutions and analyses from extensive reviews. In this view, the search has also included working papers and/or not peer reviewed documents (including PhD dissertations) focused on on-field experiments.

Modelling exercises, on the contrary, have not been included in the database. The present deliverable goal is indeed to learn from existing experience and in particular real-world cases where solutions have been implemented. In that way, task 2.3 retains the same scope of task 2.2 and is not concerned by theoretical exercises that will be the focus of task 4.1.

5 Presentation of the database and the reviewed case studies

Data base synopsis:

the task is still running with around 110 documents collected. These documents have been selected and included in a database according to their focus on policy solutions for an improved delivery of ecosystem services and/or public goods. The selected documents have been catalogued to build a list of solutions and develop an analysis to feed into Deliverable D2.2

updated 01/11/2020:

N. of documents, 120

N. of documents selected, 79

N. of scientific peer-reviewed documents 38

/report/grey lit., 41

Countries covered: 25 (but many documents provide reviews covering continental or worldwide cases)

This section distils the lessons learned from cases and solutions developed beyond the CONSOLE EU case study sample, aiming at an improved delivery of AECPGs. The range of different agri-environmental contracts reported in this section have been reviewed in the task 2.3 "Analysis of successful experiences outside Europe": the objective of that task is the building of a catalogue of experiences from different contexts that could add new and interesting perspectives for application in the EU and to feed into WP2 and the CONSOLE project a wider range of opportunities for contract design.

To optimise the relevance for the CONSOLE project, the task 2.3 will build a living document to support the activities of the project with a particular attention on grey literature to scan potential solutions able to overcome the hurdles for the implementation of new contract solutions.

In table 11, the current review of cases is outlined. 113 documents have been collected and screened. Among these, 65 cases have been reviewed. In addition, the data base includes 8 reviews of cases aimed at finding limitations and/or reasons for success of several cases worldwide, and 2 documents focusing on potential solutions that are proposed but not applied in the real

world. As described in section 3 for the EU cases, many cases belong to more than one contract type as shown in the following table.

		Secondary approach type			
		Result based	Collective	Value chain	Land tenure
Primary approach type	Result based	35	7		
	Collective	8	13		
	Value chain	1	1	2	
	Land tenure	1	4	1	14

TABLE 1: NUMBER OF CASES PER CONTRACT TYPE REVIEWED FROM OUTSIDE THE EU. THE TABLE OUTLINES THE NUMBER OF CASES WHERE A MIXED APPROACH INVOLVING MORE THAN ONE SOLUTION TYPE WAS PROPOSED.

In the review of cases beyond the CONSOLE EU case studies, result-based contracts are the most commonly found. Moreover, collective agreements are the contract type more commonly mixed with other forms of contract solutions. Currently, value chain contracts are the least represented solution. The search of that kind of contracts will be more specifically focused in the future efforts regarding the task 2.3.

It should be noticed that the reviewed cases are developed in socioeconomic and environmental contexts that are different from the EU. In addition, the policy context is usually not embedded in a wider policy framework as the CAP. That can reduce the transferability of the lessons learned to the EU. On the other hand, in many cases the tradition of e.g. result-based solutions is longer than in the EU and that will give interesting real-word examples to develop this kind of solutions in the EU.

The improved solutions that have been reviewed are developed to improve the delivery of AECPGs and tackle a range of limitations of more traditional contracts. A range of limitations of traditional forms of contracts can be summarized in: general difficulties in building of collectives, technical/economic complexity of monitoring results, reduced uptake due to high risks, administrative burden, spatial mismatch between provision of services and benefits in case of "global" AECPGs (e.g. carbon stock).

6 A catalogue of case studies

According to the goal of task 2.3 (cfr. section 2), the catalogue of case studies is scanned to identify approaches that match with the contract features targeted in CONSOLE and to highlight potential options/ initiatives that can help to overcome weaknesses and/or hurdles for the implementation of enhanced contracts. Accordingly, five main categories are identified. Some are innovative solutions but with little evidence about their effective potential and feasibility, other are less innovative but useful to show critical factors for success.

In many cases, the examples are localized to specific case studies and an overall national policy framework (like the CAP) is in general missing (except for examples from USA and China). Moreover, a number of examples are developed in socioeconomic contexts that are different from the EU (e.g. subsistence farming). These issues should be taken into account to assess the feasibility of their application in Europe.

6.1 A selection of most promising approaches

In the reviewed cases, the contract arrangements outlining interesting solutions for CONSOLE are organized in three main streams as follows:

- *New arrangements of the actors involved in the contract.* A widespread problem of agri-environmental schemes is to strike a balance between measures that are easy to uptake for the farmers and at the same time sufficiently fine-tuned to improve the environment. Thus, the intermediary is in practice a catalyst for the success of more environmental-effective types of contracts. A range of solutions proposes the implementation of more articulated schemes facilitated by the introduction of intermediaries. The objective of the intermediary is the reduction of transaction costs (e.g. administration and organisation costs reduced by means of a third party) or to shift the risks from land managers to private or public investors (e.g. the risk of not achieving results in result-based solutions). Examples of these solutions are e.g. the Environmental Impact Bond (EIB), the Forest Bank Program in USA (also included in the EU cases as F11), or a range of local watershed trusts developed in Latin America. In the EIB, the intermediary is a hub between land managers (up-taking the measure), investors (buying green bonds) and public payer (granting interests to the investor if the result is achieved).

- *Improved solutions for direct/indirect monitoring of the results.* Various approaches try to "circumvent" one of the most important hurdles in result-based schemes: monitoring of results. Several examples and studies propose to collect

a mix of direct and indirect information through different tools (e.g. auctions mixed with modelled results¹), remote sensing combined with models, self-monitoring solutions, new “futuristic” options like the DNA barcoding. In this category, we also include the “joint liability” contract which combines collective and result-based solutions. The joint liability features a collective agreement where the payment is gauged on AECPGs results. The monitoring of results is however not based on a statistical sampling procedure that would not be feasible in terms of costs and efforts. Indeed, peculiar aspect of the collective agreement is to consider the result measured in one (or few) of the members of the collective as a direct proxy for the result of the whole collective.

- *Payment setting.* E.g. conditional credits. In this category, we include solutions that leverage on more attractive payment types that in some cases can achieve higher acceptability among farmers. These examples are more common in developing countries or, more in general, in areas featuring high environmental stakes (e.g. Amazonia) under threats of agricultural expansion. In general, the incentive regards loans or better credit conditions linked to environmental commitments or result achievement. These approaches leverage on reducing the credit costs for land managers that in some cases could be more attractive than incentives and facilitate the uptake of the environmental measure. In some cases, it could be considered an anticipated payment as the credit is granted based on the commitment, whereas the result achievement is verified afterwards.

This typology of contract improvement could help the categorization of new solutions. Indeed, the three streams could target different socio-economic contexts or even “farmers types”. For instance, the first solution type could be effective in cases of weak governance settings or when it is difficult to build-up a collective. The second group is useful when result-based solutions are considered acceptable by the farmers but the operational application of payments by result is complicate. Finally, the third solution type could stimulate the uptake of environmental schemes in specific contexts.

¹ Auctions are coupled with result-based approaches so to prioritise the areas that are less expensive (better auctions from farmers) but also more effective in potential result (assessed by an ecological model). This solution is in theory very effective (best match between costs and effectiveness) but not based on direct monitoring of results. As the other solutions based or mixed with models, these solutions are not “pure” result-based.

Environmental impact bond.

(Examples in Dropbox: Goldman Sachs, Hall 2017, kalamayzer.)

matching with CONSOLE scope:

Result based contracts are considered a potential improvement of the effectiveness of contracts for AECPGs but two main hurdles connected with transaction costs are identified in literature: the first concerns the difficulty to implement an actual measurement of the result in particular when the output is complex (e.g. biodiversity). On the other hand, the interest in result based approaches is specifically linked to issues where the efficacy of the scheme is complicate to disentangle a-priori (i.e. uncertainty regarding the link between action and effect). That hampers the feasibility of result based contracts as the costs linked to monitoring are in some cases higher than the cost of the scheme itself.

The second hurdle concerns the risk of not achieving the result that is shifted on farmers (even in cases where the fault is not of the farmer, e.g. behaviour of neighbours, climate extremes, etc.). That will reduce the uptake of such measures and the interest of farmers in particular when the result is not under the control of farmers and/or specific capacities are required (e.g. achieving an increased rate of nesting bird population).

In this context, the Environmental impact bond can help to overcome both the hurdles as: the risk is not shifted on farmers but on private investors and monitoring the achievement of the result is committed to an intermediary (local) agency that can (under certain limits) adapt the scheme to ensure better results.

Brief description of the approach:

The approach is developed from the green bonds with the inclusion of result-based prime payment. The scheme is summarized in the figure 2 (Hall et al., 2017) and regards 4 main actors: private investors providing the funding, an intermediary emitting bonds, a public institution granting the bond (+ interests) conditional to the results, and landholders/managers uptaking the scheme.

The core is the intermediary that connect private funding (e.g. an investment trust) with contractors (farmers) and the public institution that grants the payment. In practice, the risk of achieving the result typical of result-based programmes is shifted from farmers to private investors, whereas the public institution should grant interests to investors in case of the results achievement. The critical factor is the establishment of the intermediary (e.g. a no-profit

agency) which should design, implement and eventually adapt the programme on-the-run to ensure the results.

Strengths: combines advantages of both outcome-based and action-based schemes, farmers agree to uptake the actions designed by the intermediary without risks linked to results (but should agree a certain adaptation of the scheme to achieve the results).

Weaknesses: availability of an intermediary with skills and capacity to make it working. Currently implemented just in one localized case study in USA for the development of green infrastructures, but other EIB proposals are appearing in states and municipalities throughout the country. Hall et al. 2017 proposes its application in New Zealand. Still, the technical problem of monitoring results is present as it is just shifted on the intermediary.

fig 2 (Hall et al., 2017) schematic outline of the Environmental Impact Bond scheme

Joint liability.

(Examples in Dropbox: cranford 2011, see also Yang 2013).

matching with CONSOLE scope:

collective agreements and result-based approaches are core contract approaches in CONSOLE. The joint liability is potentially interesting as it combines both approaches and can reduce consistently the efforts related to monitoring results (one huge hurdle for implementing result-based).

Brief description:

The joint liability is essentially a collective agreement contract that considers the individual performance as a direct signal of the performance of the collective under contract. In doing that, the approach is a mix between collective and result-based programmes: a community or collective agrees to a payment scheme linked to a specific and measurable result. That result is however measured in a randomly selected part of the area under management (e.g. one farm). The collective performance is assessed on the base of that partial information (that could be inexact, but relies on social-control mechanisms). The

programme should in theory generate a community level monitoring effort to avoid risks to fail the results or non-compliance of some members.

Strengths: strongly reduce the monitoring costs and allows therefore direct monitoring and high targeting of results.

Weaknesses: it leverages on strong community-level interactions. Therefore, not easy application everywhere. It adds a further hurdle to the formation of a collective (payment partly dependent on neighbor behavior) and presumably increase transaction costs.

Conditional credit

(Examples in DropBox: IUCN 2009, wetlands international 2009, mandel 2009, Cranford 2011, Asuncao 2013, etc.)

Matching with CONSOLE scope:

The main interest of CONSOLE on this case types lies in the cost reduction focus (credit interest reduction) in comparison to the increased income approach (monetary incentives for specific action) typical of EU agri-env schemes. For some farmers, cost reduction linked to achieving a specific result could be more attractive (e.g. tax reduction or lower interest rates on credit) than payments for a specific result.

Brief description:

The core of the conditional credit approach is to link the credit to a condition implying the provision of ecosystem services. The condition may include the uptake the measurement of results. The advantage for the farmer or the community consists in a partial or total interest rate reduction if specific results are achieved.

Strengths: could be a mixed output/action based payment where the payment is linked to the action uptake and the interest rate reduction is linked to results.

Weaknesses: scarce feasibility of the approach in EU (even though some interesting insights are present to improve current contract design).

Local markets/trust.

(Examples in Dropbox: water quality trading program, watershed schemes in Iurie 2013, Nelson 2009).

Matching with CONSOLE scope:

A difficult aspect of payments for AECPGs is the design that matches with local-scale contexts (both environmental and socio-economic). Local-scale design of schemes is more typical for watershed services. The services depend on the context to make the scheme more attractive for specific socioeconomic contexts (e.g. clean water, landslide protection, etc.). The main interest for CONSOLE lies in the organisational framework of these schemes that usually are based on a local trust.

Brief description:

A number of examples exist of local marketplaces typically for watershed services. The programme may involve a trust (public or private or mixed) that promote and implement the scheme. In other cases, a private sector (e.g. tourism) pays for specific services. The core of these programmes is the regional size, typically a watershed service scheme involving a urban centre and upstream lands and typical services are related to water.

strengths: the local scale should promote interest in the buyers (residents). When a trust is created, the public institution does not need specific expertise and/or investments as the trust is in charge of design, implement, control and selling of environmental credits to the public institution.

weaknesses: creation of the trust is not easy and not all services are fitting e.g. less direct benefits from biodiversity in comparison to clean water.

Improved result-based programmes.

Matching with CONSOLE scope:

As mentioned above, one of the main critical aspect of result-based contracts are monitoring and risks connected to result achievement. Focusing these two issues, a range of studies and cases propose improved technical or institutional solutions for monitoring results:

- a. Some approaches propose potential improvements based on indirect monitoring (e.g. remote sensing or models) + self-monitoring, (Stroud, Ryan, Yang

2013, Hasund 2013, Sidemo-holm). Self-monitoring cannot involve complex targets or indicators but can be useful for habitat and basic richness-based biodiversity indicators. Problems of willingness for self-monitoring and trust in self-monitoring need to be considered.

b. Lowcost biodiversity monitoring techniques: DNA barcoding. Currently under study but not operational (as far as I know, but see recent research projects: potential breakthrough techniques in the next years)

c. Results mixed with auctions. Tenders for results to disclose which result is less expensive according to farmers' knowledge or which result involves lower risks for the farmers. Strengths: This approach can be related to "jointness" of services if the farmer considers a service of some worth for agricultural production (e.g. soil organic matter, earthworms). In that case, farmers could accept lower payments. Weaknesses: problems with additionality may arise (farmers tendering for results already present in the farm, e.g. nesting of a specific bird). Auctions could reduce the need for monitoring but still some monitoring effort is required.

7 Conclusions

On the base of the analysis, here following are listed the main reasons for success or failure of the cases beyond the CONSOLE EU case studies that are considered most interesting for the improvement of EU contract solutions. The reasons for success are based on a qualitative analysis of the case descriptions and are not presented in order of importance (cfr. Also D2.4)².

Reason for success 1: reducing risks linked to results. Focusing on variables that farmers perceive not under their control led to higher risk, pressure and “disutility” for farmers. For instance, the complexity to control and monitor results drove to a shift from result- to action-based schemes in the Florida Everglades Water scheme. On the contrary, focusing on long-term range of measurements (e.g. in a slot of several years in the Swiss pastures) ensured to limit the effect of adverse events on results. In the Environmental Impact Bond, the risk for farmers is shifted on private investors following a green bond scheme. That solution could be useful when farmers’ interest for result-based payments is low and private’s interest for environmental results is high. However, in the Environmental Impact Bond the land manager essentially agrees to uptake an action-based scheme and all the awareness/education added values acknowledged to result-based solutions are no more relevant³.

Reason for success 2: reduced costs for monitoring results. In two cases, a high cost of monitoring was the reason that limited the scheme survival. On the contrary, in other cases relying on lower level information provided by farmers or volunteers resulted in higher efficacy. In a further example (joint liability), the cost of the information is reduced by reducing the sampling intensity. That could be particularly useful for “landscape level” species such as birds for instance that depend on landscape level practices and less on local on-farm practices.

Reason for success 3: farmers’ interest and social revenue. In a pilot scheme in UK the high interest of farmers in the target variable (earthworms) helped to involve and engage them in the measurement and payment by result schemes. In the *Prairies Fleuries* in France, the possibility for farmers to show their capacity to their peers was considered a reason for success (including the prize ceremony at the national agriculture show).

Reason for success 4: resources availability. Obviously, sufficient availability of funding is necessary. Successful examples include cases where available funds

² NB it is relevant to define the assessment of “reason for success”. In many cases, a solution was considered successful because the uptake by landholders was good or simply because the contract survived the setting up phase and was active after several years. In some cases, the implementation of the scheme was only in a pilot phase and the success is therefore potential. Success in terms of measured environmental result are very scarce also in the case of result-based solutions.

³ The intermediary in the EIB is nonetheless appointed to manage and adapt the scheme to improve the effectiveness of land managers’ actions.

were present. For instance the Vittel Water scheme in France where the private water investor was able to offer high payments and even the purchase of land in the watershed. However, it is relevant to notice that the availability of resources alone is not sufficient. Resources are effective when employed to facilitate a shift towards more environment-friendly practices.

Reason for success 5: additionality. In some land tenure cases, the additionality was not a necessary condition. For instance, the biodiversity easements or the land fire abatement were granted for areas even though these were not probably objective of developments or agricultural expansion. These schemes are more similar to protection/preservation schemes.

Reason for success 6: relying on existing collectives. The possibility to rely on a well-established collective ensures better results. On the other hand, the building *ex-novo* of a collective is usually complicate. It is the case of the carnivore payment scheme for predators' cubs in Sweden. The payment was calculated on the expected disservice for the local Sami populations derived from the reindeer attacks of lynxes and wolverines. The Sami are traditionally organized in collectives (villages) and that eased the implementation of the scheme, monitoring of results and in general lower transaction costs.

Reason for success 7: communication. In the Florida Everglades, the scheme started as result based, but payer and farmers agreed to shift to action based solutions after the first years. The monitoring was considered too complicate and stochastic both by the farmers involved and the public agency. Even though shifting from result-based to action-based schemes can be considered a failure, without mutual communication and willingness from both parties the scheme would have been stopped. In this example, we stress how communication and ability to adapt to constraints is relevant for the implementation of successful schemes.

Reason for success 8: payment setting. In some cases, cost reduction is more attractive than higher revenues. That is the case of reducing interest rates or tax reductions conditional to some agreed environmental result. The cases following that approach are common in Latin America where credit access is sometimes a limitation. Therefore, the potential of this approach in EU needs to be considered carefully.

Reason for success 9: appropriate intermediaries. In many cases, the existence or ad-hoc creation of an intermediary was a necessary condition for ensuring the implementation of more articulated and effective contracts. That is the case of many watershed trusts charged for organizing and distributing the payments for improving water quality. That is also the case for the Environment Impact Bond where the intermediary is the pivot of the whole scheme.

To a large extent the success factors listed above confirm insights from cases in the CONSOLE partner countries. However, they allow the consideration of a broader variety of solutions. On the other hand, this also depends on the specific institutional context where they are located, which means that potential for replication should be taken carefully.

The fact that a large part of the experiences and certainly of the evidence is rather recent encourages the continuation of this task providing updates during the whole project life.

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11 Appendix C: database presentation (available at CONSOLE repository: version V1 29/10/2020).

document	link/ source	country	brief description	contract notes	secondar addressed	AECPGs	contract forestry	models for monitorin g type	repository list name
7 p 9 a p e r	Journal - Washington- 98(3):22-25	USA	Forest Bank - a forest conservation program in Indiana and Virginia, US	d 2.4 fact sheet l	carb on sequ estrat ion, biodi versit y, value s		f o r e a t r y e		dendri ck 2000

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7 p Front Ecol glob review of biodiversity
8 a Environ al offsets case studies
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* la biodi v p
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7 p ecological neth community
7 a indicators erlan governance
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agricultural landscape c

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7 p ecological
6 a economics,
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Swe green
den procurement for organic
farming. Although the
public sector only
accounts for 4% of the
Swedish market for
foods, the researchers
suggest that public
authorities acting
together have sufficient
buying power to
influence wholesalers:
The mean share of
organic farmland in
Swedish counties rose
from 6.9% in 2003 to
19.8% in 2016 linked to
the GPP.

pubic public procurement to v
develop organic a
farmland. Analysis of l
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n GPP

71 Univ Brasilia
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Brasil
restauracion of cerrado
in Brasil with adaptive
management following
monitoring

An example of adaptive
management with direct
monitoring

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scientific team (university)

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a s e d e m c e r r a d o

7 p ecosystem 4 a services v. 6 p e r	US and Ger man y	results from 2 workshops a comparative analysis on PES, include a list of c.a. 40 output based PES. The work also supports output based payment as a likely driver of success for PES and USA. Expert judgment.	*rev iew (ma in: resu lt bas ed)	vario us ri o u s	v v a a ri ri o o u u s s	sattler 2013
7 p ecosystem 3 a services v. 6 p e r	S. Ame rica, Afric a, Asia	analysis of 40 case studies of water service payments, outputs based contracts are rarely included in the contract. Mainly action-based	* r e v i e w	wate r ri o u s	v v a a ri ri o o u u s s	martin - ortega 2013

7 p ecology & cost list of cases with some 5 case studies, no * water, v
 2 a society a features about innovative contracts r wildlife a
 p rica, contracts, but no e biodivers ri
 e phili innovative solutions for v ity, o
 r ppin contracts or monitoring. i carbon u
 es, The objective is to e sequestr s
 keny understand origin of w ation
 a, contracts of service
 uga provision reward
 nda,
 S.
 Afric
 a

7 w Arizona chin list of 14 PES schemes review of PES - * agrobio p
 l o University a existing in different agrobiodiversity r diversity, u
 r USA countries. The aim is to schemes - cfr. Table 1 - e erosion b
 k Austr provide an analysis of some interest is in the v protecti li
 i alia efficiency but some comparative difference i on, c
 n features are provided and the classification of e various
 g approaches: technical w
 p assistance as in-kind
 a payment in China,
 p selection of participants
 e based on cost and
 r expected performance

in Australia and USA,
tenders for unemployed
people to restore lands in
S. Africa.

7 p glob 0 a change p e r	env mes oam eric a	a list of ES payments types: offset, easements, action-based payments in watershed, debt purchase,	innovative approaches are not present, the focus is on assessing the different equity of v different implmented i schemes.	*	wate f p r, o u carb r b on e li sequ st c estrat ry ion sy st e m	corber a 2007
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6 p ecosystem 9 a services p e r	Sout h Ame rica	a review of 40 case studies but no innovative types, the aim is to identify keys for success	reviewing case studies to look for success factors and effectiveness. Mechanism involved for payments are focused: in kind or cash -> no conditional payments w such as result based or collective.	*	Biodivers v ity, a landsca ri pe; o water; u carbon s	grima 2016
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6 p ecosystem chin review of watershed 27 case studies in China * mainl v p
 8 a health and a + level payments in China and beyond: mainly r y a u
 p sustainability othe and beyond to find kinds of land-use e wate ri b
 e r conditions of success conversion where v r o li
 r and identify best options cropland is transformed i u c
 according to local in forest or grassland e s
 conditions w

feng
2018

6 r ALCA Trust fr austr report on leverages for recommendations for r biodi v p
 7 e Nature alia financing conservation: private environmental e versit a ri
 p Australia Deploying and scaling- protection schemes s y, ri v
 o up existing or new finance approaches to support private land U vario o a
 r support private land conservation. cfr. 4.4.8 and 4.4.9 where green l us u t
 t conservation. cfr. 4.4.8 and 4.4.9 where green bonds and outcome- b s e
 based models are described (including environmental impact d a n
 bonds d e p
 bonds b
 li
 c

6 w School of austr a review of auctions and little additionality from * biodi f p critical issue for auctions, black
 6 o Agricultural alia offsettings in Australia auctions is reported as r versit a u more efforts required: more
 r and with potential participants have in e y r b Develop low-cost

k Resource
i Economics -
n Univ Western
g Australia
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improvements. identify general positive v
the relative importance environment attitude i
of the factors that e
determine the overall w
willingness to participate
in, and cost-
effectiveness of,
conservation tender and
biodiversity offset
programs for biodiversity
conservation in Australia

m li monitoring strategies
in c through monitoring
g specific and measurable
activities and considering
self-assessment by
landholders. (However,
site visits by agency staff
for monitoring were much
preferred by landholders.)

6 p Nature glob review of enabling agriculture land use and * wate v
5 a Communica al conditions for local less protected area are r r a
p tion based payments for enabling conditions e ri
e watershed services v o
r where city residents pay i u
for (mainly drinking e s
water service) upstream
landowners w

6 p PLOS ONE UK empirical example of not a payment scheme r soil f n self-monitoring
4 a farmer monitoring for but evidence for self- e health a a
p earthworms - 57% report monitoring of outcomes s h r
e willingness to change u m
r l

practices on the base of
monitoring result

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6 p land 3 a policy p e r	use swe den	an example of model to assess results of result- based schemes,	result oriented scheme. starting with flexible result based schemes where farmers decide best practice, then suggests a model based scheme where best location for buffer strips is identified.	r e s u l t b a s e d	wate a p r r u a b bl li e c	mo sidem del o- of holm wa 2018 ter pol luti on fro m agr icul tur e
6 r UNDP 2 e p o	glob al	state of 39 (+ 25 under development) biodiversity/forest offsetting programs.	in general offsetting (compensatory mitigation)	l a n d	carb f p on o ri sequ r v estrat e a	various, from direct to more indirect en 2010

r Including description
t and factors for the
building up of the
program

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6 w Working austr LAB EXPERIMENT to not a case study but an r biodi f p direct (not specified ow) schilizzi
l o Paper 1102 alia assess auctions with experiment: adding an e versit a u 2011
r Univ Western & result based outcome-based s y r b
k Australia Ger condition on tender u m li
i man contracts. Result: risk- l in c
n y aversion induces low t g
g effectiveness of b
p outcome based tenders a
a s
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6 r Swiss glob a list of more than 200 the payments are v c wate v v benne
0 e Agency al watershed payment classified as: bilateral a ol r a a tt 2013
p Developmen (30 programs (China, USA, agreements (direct ri le ri ri
o t cou etc.) deals between payer o c o o
r ntrie and provider), funds, u ti u u
t s) trading & offsets, s s s

instream buybacks v
 (water rights). Innovative e
 approaches are not the
 focus of the report but
 just to evidence main
 trends.

5 p 9 a p e r	PNAS	Chin group size effect on environmental monitoring and management: Using data gathered from the Wolong Nature Reserve since 1995, we examined the effects of group size (i.e., number of households monitoring a single forest parcel) on both collective action (forest monitoring) and resource outcomes (changes in forest cover)	data on a nature reserve case study	c r o e ll s e ul c t t b i a v s e e d	biodi f p versit o u y, r b carb e li on st c stock ry	collective self-monitoring yang 2013
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5 p ecosystem
8 a services v. 6
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USA market for local water the local waterboard is *
ES, the core is to define a the intermediary. PES
marketplace at local local marketplace
scale where buyer and
seller are (spatially)
closer

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2013

5 r wetlands.org
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afric microfinance scheme:•
a Step 1. Local for adopting an action
and communities receive but for poverty
asia micro-credits to develop alleviation, the e ul
sustainable income environmental objective
generating activities. is the condition to make
activities.

c r carbon p Micro-credits are wetlan
o e sequestr ri converted into definitive ds
ll s ation, v payments upon intern
e ul fresh a conservation service ationa
c t- water t achievement l 2009
t b supply e
i a and

- Step 2. Communities repay their loan and the associated interest in the form of conservation services, such as reforestation, habitat protection and refraining from unsustainable land use practices.
- Step 3. Micro-credits are converted into definitive payments and subsequently into community-based revolving funds for sustainable development, once the conservation measures prove successful and sustainable.

5 p conservation it a financial capital it's an environmental r la biodi upon successful delivery mand
 6 a letters see available for lending is mortgage where the e n versit of conservation services el 2009
 p ms linked to the natul environmental asset is s d y

e that capital (biodiversity) the warranty - NB u t at the end of a
 r pilot conserved targeting biodiversity l e contracting period
 proj and not other ES where t n
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5 r climatepolic Brasil credit to amazonian a key finding is that r c forest f p borrowers have to assun
 5 e yinitiative.or rurals conditional to credit availability (also e r relat a u provide proof of çao
 p g uptake of environmental for PES) will generally s e ed r b compliance 2013
 o regulations lead to deforestation if u di (carb m li
 r not conditional to l t on, in c
 t stopping deforestation. t b biodi g
 "leakage" effect b a versit
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latin a range of PES projects in cfr. Annex 2 lower rates
Ame S. America, include in- granted to uptake of
rica kind payments, sustainable agricultural
technical assistance and practices
conditional credit

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www.ecoent latin credit granted to SME
erprisesfund. Ame contributing to ESs
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5 P thesis Londn ecu	ch. 5 case study on conditional loans where the credit or the interest is forgiven conditional to achieving an environmental objective	r e s	e s	cranfo rd 2011
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5 P thesis Londn colo	ch. 6 water fund case in Bogotá (joint liability)	joint liability is an economic innovation where the group is granted advantages in credit (e.g. no interest	c e l l e u l c t	collective self-monitoring cranfo rd 2011
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rate) if an environmental t b
conditionality is i a
respected. If a member v s
of the collective is not e e
compliant all the d
collective loses the
advantage.

5 p ecol econ v. peru
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community based voluntary and payment c
conservation of polylepis contract (birdwatching o
forest on Andes (21 fees) ll
communities). e

na, local community is cranfo
rewarded by tourism and rd
manage wildlife moura
accordingly to
2011

4 p geoforum v. mexi
9 a 39
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forest conservation, an assessment between c r
co biodiversity + carbon participants and not o e
seq. participant of values, ll s
institutions, size of e ul
community, etc. c t

na, local community is kosoy
rewarded by tourism and 2008
manage wildlife
accordingly

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4 r Working	mexi	Payment	for	ES: national coverage PES	r c	southg
8 e Paper	No. co	watershed protection		example in S. America	e ol	ate
p 07-07 USAID					s le	wund
o					u c	er
r					l ti	2007
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4 r Working	ecu	Payment	for	ES:	l c	southg
7 e Paper	No. ad	watershed protection			a ol	ate
p 07-07 USAID					n le	wund
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r					t ti	2007
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4 r Working	ecu	Payment	for	ES: started as a	direct r c	3 month roll by NGO then southg
6 e Paper	No. ador	watershed protection		monitoring	for e ol	government then no ate
p 07-07 USAID				conditionality,	then s le	monitoring because of wund
o				monitoring	was u c	effort required er
r				unfeasible	l ti	2007

4 p conservation	mad	assessment of behaviour	one of few studies	c	by NGO	somm
5 a biology v. 24	agas	and attitude change	assessing impact on	o		erville
p	car	following a community	behaviour and attitude	ll		2010
e		based PES	(even though based on	e		
r			self-reported changes	c		
			and not observed)	t		

4 r research	austr	multiple auction round	design that favours	r c	photo evidence about windle
4 e gate	alia	biodiversity scores (33%),	land score (22%) and	e ol	grass biomass, self- 2007
p		aggregation of land.	after the auction round the	s le	reporting + random audit
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sites are weighted to MAX biodiversity potential
and aggregation of land

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4 r https://en.wi
3 e kipedia.org/
p wiki/Commu e
o nal_Areas_M
r anagement_
t Programme_
for_Indigeno
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zimb payment for wildlife services (tourism hunting) as a
abw substitute to agricultural expansion

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rewarded by tourism and munal
manage wildlife Areas
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(CAM
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4 p conservation India
2 a biology v. 17

predator conservation empirical study to assess
by means of community feasibility

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2003

per based insurance and
pastoral activity
reduction

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4 r	https://marketplace.carbonmarketinstitute.org/wrest-arnhem-land-fire-abatement-walf-project/	australia	an example of carbon offset where the additionality is avoided fire risks	general the additionality is carbon stock increase, here is avoidance of carbon stock decrease	the land carbon d	na	West Arnhem Land Fire Abatement (WALFA) Project
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4 p 0 a p e r	conservation biology v. 24	Tanzania	community-based payment by operators to reduce settlement and agriculture in a key wildlife area	no public institution or NGO involved	conservation	na	nelson 2009
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3 r 9 e p o r t	world bank Cost a case study similar to covers c.a. 10000 ha. I a the Vittel Water but a similar schemes present a Rica public hydric facility in S. America n adopting water tariffs d paid by the population t and transferred to e upstream landowners to n finance forest protection u or reforestation to r protect water quality e and regimiation	payment by action and world commitment for at least bank 10 y. 2007
3 p 8 a p e r / r e p o	rangelands USA carbon offset description for rangelands in USA. I r interesting because results are monitored and a e because a "broker" institution facilitated the entry of n s rangers (National Carbon Offset Coalition and the d ul North Dakota farmers Union). Also, farmers hurdles t t to adopt and perceptions etc. are analysed e b n a u s r e e d	estimation based on gosnel location. rangelands are 2001 extremely heterogenous and remote (and dangerous sometimes to survey). Monitoring costs with on ground methods are prohibitive

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37	national landcare program order t	australia list community projects	of granted not all targeting	landcare agriculture	landcare agriculture	landcare agriculture	landcare agriculture	landcare agriculture	landcare agriculture	community landcare grants
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36	national landcare program order t	australia map community projects	of granted not all targeting	landcare agriculture	landcare agriculture	landcare agriculture	landcare agriculture	landcare agriculture	landcare agriculture	landcare map
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3 r national 5 e landcare p program o r t	austr alia	a list of programs not all supported for agriculture community environment grants	targeting l c a ol n le d c t ti e v n e u r e	na	caring for our countr y
3 p Economie 4 a Rurale 355 p e r	Mor occ o	choice exp to identify best practice for community participation to PES	empirical analysis c o ll e c t i v e	na	moka ddem 2016
3 r MERIT 3 e project p o	CH	description of the Öko- Qualitätsverordnung, ÖQV in Canton Lucerne	described also by Zabel 2019, the report presents other EU cases r e s u l	to enter the scheme at least 6 species from a list should be present in the pasture, MAX payment is 1500 SFr.	erant report MERIT projec t

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3 p	American	USA	an empirical study on	one year experiment	c	water	quality	data	collins
2 a	Agricultural		facilitating	team	o	collection			maile
p	economics		formation to achieve		ll				2008
e	association		water	quality	e				
r			improvement in the	watershed and its results.	c				

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3 p	land	use Swe	a comparison between	theoretical	approach	r	aerial	photo,	satellite,	Hasun
1 a	Policy	den	current and indicator-	applied in 2	case studies	e	survey, GIS			d 2013
p			measured payments in			s				
e			Sweden. With indicators			u				
r			the policy is more			l				
			efficient but could			t				
			infringe WTO CAP			b				
			principles, 2nd problem			a				
			is regards the calculation			s				

of the payment for result unit, 3rd problem is that using proxies as indicators triggers strategic behaviour (maximising the proxy and not the result)

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3 p The 0 a Australian p Journal of e Agricultural r and Resource Economics, 56, pp. 1–21	Austr alia	A comparison between NB not a case study but a theoretical application and payment by results: using satellite data and fixed payments are the least cost-efficient, payment by results is second best after auctions.	satellite + vegetation to measure a change in species	white Sadler 2012
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2 r IEEP 9 e p o r t	CH	Rebflächen mit natürlicher Artenvielfalt (ÖQV)	orchards vineyards	IEEP result based
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2 r 8 e p o r t	IEEP	CH	Öko- Qualitätsverordnung, ÖQV	maybe the same as r described in Zabel 2019	species rich grasslands	IEEP result based
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2 r 7 e p o r t	IEEP	CH	Pastures in Solothurn	maybe the same as r described in Zabel 2019	species rich grasslands	IEEP result based
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2 r thefreshwat USA the freshwater trust acts the trust sells cooling r the trust monitors the water
6 e ertrust.org as an intermediary water credits to the city e results using dta and quality
p between buyer an seller water treatment facility s technology, not clear tradin
o providing "quantified to comply with water u how and how much it g
r conservation" and temperature after l costs... progra
t ensure credits are based sewage treatment. t m
on results Cooling systems would b
be more expensive than a
incentivizes to s
landholders and credits e
are measured in calories d
absorbed. The results
seem strongly based on
models

2 r wri.org USA another biodiversity monitoring will be peer l credits depend on gophe
5 e offset credit scheme reviewed and science- a monitoring net r
p (habitat for gopher based but still under n conservation benefit toroise
o tortoise credit) development d
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USA technical report of pilot water retention programs including the Lynch and Shabman report case. Started as result-based but then became fixed fee based on average historical data of water volume because preferred by farmers and payer

nutrient loads and water stored south florida water district 2018

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National wetlands Newsletter
USA an example of program developed as result-based but adapted as fixed year payment because of stochastic fluctuations of results. Objective is incentives for dispersed water retention to improve

costs incurred by farmers + lump sum are the basis for calculating the incentive

reduction in nutrient loads and volume of water retention, but such variables depend on rainfall and both buyer and seller prefer fixed amount based on models and evidence on water retention functioning

water quality and floods
in the Florida Everglades

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provided by the farmers +
pump records data.

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it is an easement, where
a property enters into a
conservation bank
accompanied by a trust
account (ensured by the
property) and can sell
conservation credits for
biodiversity offset. The
credits depends on the
species protected as
established through
monitoring.

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the US wildlife service Fitzgerald
detrmines the credit in old
monitoring rounds at year ranch
0 10 15 20 and then every
10 years.

2 r pag. 26
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New based on the proposal, not currently r
Zeal Environmental Impact applied
and Bond idea: shifts risk from
taxpayer to investor

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an evaluator acts as hall
monitoring entity to report 2017
impacts to the
government that pays
interest rates

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2 r 0 e p o r t	pag. 130	USA CSP	CO nservation now the payment r	estimate	of res	USDA
		Stewardship program. considers costs and e	considers costs and e	conservation	ult	2019
		considered a payment performance	performance	performance	ba	
		for performance as (estimaated) for u	(estimaated) for u		se	
		higher payment is different practices	is different practices		d	
		foreseen for higher performance.	foreseen for higher performance.		on	
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1 r 9 e p o r t	pag. 124	USA CRP	conservation 22 M ha enrolled in 2018 r	the Env.	Benefits ex-	USDA
		reserve program (more than 36 M in 2007). e	(more than 36 M in 2007). e	Index is an ant	2019	
		incentivises land payment is not s	payment is not s	assessment of e		
		retirement and grassland depending on results, u	depending on results, u	potential effects and res		
		protection (grazing can be allowed). An used to admit or not the t	but potential results are l	requested asking ult		
		Environmental Benefits bid. Moreover, if farmers b	used to admit or not the t	price to optimize mo		
		rate is calculated to agree to retire land they a	bid. Moreover, if farmers b	cost-efficiency	del	
		evaluate bids and select have no land use s	agree to retire land they a		ing	
		the land at or under choices	have no land use s			
		market rental rate.	choices			

1 r pagiola 2004 nicar extensive report idem like pagiola 2004 * idem pagiola
 8 e ecol econ agu published on ecol econ a 2004
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1 p pagiola 2007 nicar pilot World bank project result based as r payments depends on pagiol
 7 a ecological agu financed to a local payments are made e increase of biodiversity a 2007
 p economics a, NGO. Objective is the after the ESI is assessed, s and CO2 sequestration Regio
 e Colo application of improved farmers are free to u based on an al
 r mbi pastoral practices that decide land use (but l Environmental Services Integr
 a, after a starting period advisors suggest best t Index (expert panel rate ated
 Cost under incentives practices) and the ESI b land uses) + verification Silvop
 a (should) go on in the strictly depends on the a with astoral
 Rica long term because the land use type. Payments s bird/butterfly/ants/mollus Ecosys
 new improved practices were made for the e cs monitoring and tem
 are better and more purpose of overcoming d research. Payment levels Mana
 profitable. cost barriers to adoption were set at \$75 per game
 incremental point per nt
 year over a 4-year period, Projec
 up to a t

maximum of \$4,500 per farm.

<p>1 r LUPG018 6 e pag. 191 p o r t</p>	<p>Austr auctions for securing idem, result is potential r c alia multiple goods but considers also e ol (enhancement of aspects as distance s le biodiversity, control of between sites to get to u c salinity and ground an optimal biodiversity l ti water recharge impact (by model) t v abatement). In addition, b e landholders are a encouraged to put in s joint bids for e conservation sites d (where these sites cut across boundaries of tenure or where sites are geographically close and would benefit from joint management)</p>	<p>regional metric of The _biodiversity Auction complimentarily' which n for takes into account Lands _synergistic' effects cape caused by the number, Recov size and distance of sites, ery in addition to the pilot calculation of an schem environmental benefits e index.</p>
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<p>1 r LUPG018 5 e pag. 182 p o</p>	<p>austr auctions to select the applied in pilot areas. r alia land that will be entered Sites offered in the bid e into the scheme, The are surveyed to assess its s objective is to conserve contribution to the u the biodiversity of native objectives. The result is l</p>	<p>Assessment of single ex The sites is made through ant Bush the calculation of e Tender the Biodiversity res pilot Benefits Index ult</p>
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vegetation through actually potential and t
means of stock based on ex-ante b
exclusion, the retention ecological data a
of fallen trees and timber s
and through the control e
of weed and invasive d
species.

(Biodiversity mo schem
Significance Score x del e
Habitat Services ling
Score / Cost
announced by the
landholder) and the
necessary
ecological data is
collected by
scientists.

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pag. 130

den
mark
This scheme has a long
history and originated in
the west of the country in
the late 1800s in an effort
to prevent soil erosion. By
the early 1900s, fixed and monitoring t
approximately 150 local
planting associations
had been formed. The
scheme is now
applicable to the whole
country and has
expanded its objectives
to also increase biotopes
and ecological corridors

the local planting c
association decides and o
coordinates farmers ll
where and when e
planting but species are c
fixed and monitoring t
regards good i
agricultural conditions of v
hedgerows not wildlife or e
ecological corridors or
effects on erosion

5% of hedgerows are Hedg
monitored yearly erow
Plantin
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Sche
me

on agricultural land in addition to preventing erosion. The scheme is not exclusive to collectives only, individuals can apply but in 2005 78% of all funded projects were collective

1 p 3 a p e r	Land Use France	prairies fleuries. Flowering meadows. Result based as an award: farmers participate to a contest where the pasture more biodiverse (=more flowers) are awarded a prize	NB not extra EU. farmers are free to manage their pasture to achieve the best result and be awarded	r e s u l t b a s e d	on-ground survey	fleury 2015
1 r 2 e p o n d e v e l o p m e n t	https://www.brookings.edu/blog/education-plus-development	USA not applied in agriculture but the Environmental Impact Bonds can be a reference. These are	By transferring risk, EIBs can support innovative natural infrastructure solutions to achieve an outcome which may	r e s u l t s m a y l	Stormwater runoff will be measured at two points in the 5-year plan to create a baseline, and	Gold Sachs first DC

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t /paying-for-
social-
outcomes-a-
review-of-
the-global-
impact-
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market-in-
2017/

type of green bonds: otherwise be too risky for t
contract between utilities and public b
parties, where a portion entities to pursue. -the ES a
of the repayment to seller is a public agency s
investors is based on the and not a landholder- e
outcome of a particular but pay-rate depends d
intervention. In the case on results: If runoff flow is
of the DC Water reduced as expected,
environmental impact DC Water will pay full
bond, the outcome is principal and an
the efficacy of green effective return of 3.43%
infrastructure in reducing to the investors (Calvert
stormwater runoff, versus Foundation and
conventional grey Goldman Sachs) at
infrastructure options. maturity. If runoff
reduction is more
effective than
expected, DC Water will
pay investors a bonus
“outcome payment” of
USD 3.3 million (an
effective return of
around 6.4%). DC water
will then work to scale up
green infrastructure
implementation across

then to evaluate the Water
intervention. EIB

the District. If, on the other hand, runoff reduction underperforms expectations, investors will pay a “risk-sharing payment,” meaning they will have a lower effective return from the investment of just 0.5%. If this was the case, DC water will consider stopping all future green infrastructure projects and continue to invest in grey infrastructure.

1 r https://www. USA
1 e forestresilien
p cebond.co
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Investors provide upfront capital with public and private beneficiaries then making contracted payments based on the water, fire, and other benefits created by the restoration activities

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an evaluation board forest follows several economic resilience valuation methods such as avoided costs bond (https://www forestresilien cebond.com/roadmap-report/forest-resilience-bond) but it does not seem to include on-ground surveys

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Fran description of the Vittel land purchased and left
ce case study where Nestlè in usufruct
Waters has implemented
a water protection
scheme in the
watershed.

l r water li p research team monitors
a e r v ri water pollution levels, Vittel-
n s e v Nestlè intermediary check Franc
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cec.org Can design of a pay-by-result it is stated that r
ada scheme to conserve monitoring results-based e
(Sask Sprague's Pipit (Anthus PES programs can cost s
atch spragueii) and Swift Fox as much or more than u
ewa (Vulpes velox). Two the incentive payments l
n) species at risk to land managers in t
programs where species b
at risk are the target a
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on-ground survey. Several prairie
options envisaged: land beef
managers- other and
organizations - volunteers biodiv
ersity

8 p a royal society p e r	proceedings na	cfr. §2.b	Many projects not a case study but * may facilitate analys of potential for implementation of result- monitoring pollinators, based about biodiversity carbon stock, and ecosystem services biodiversity & ES in agricultural land (citizen science-based)			biodivers ity, carbon stock	citizen science	ryan 2018
7 p a Policy v. 63 p e r	land use Perù Bolivi	pilot payments agro-biodiversity conserva-tion services (PACS) schemes in the High Andes aimed at enhancingthe conservation of traditional quinoa landrace varieties.	for focus on collective c tenders not on results. o Survey on different ll performance of group e bid/type/interaction c including comply and in- t of group monitoring i quinoa v landrace varieties. e				collective group monitoring (taken into account)	self- narloc into h 2017
6 P h D t h e si s	UNI-Bonn.de ethio pia	cfr. ch. 4 application of outcome based payment	empirical do outcome based r contracts achieve better e results and trigger s intrinsic motivation? u l t b a				on-ground survey	Andelt ova 2017

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5 p a Congress p e r	EAAE 2011 Sweden	linx and population scheme: for 61 Sami communities in Sweden	wolverine scheme: PES community	c.a. 20,000 euro per new offspring to the community	r c e o l s l e u c l t i v b e a s e d	on-ground survey (locals + zabel technician together) 2011
4 p a p e r	Conservation and policy Sweden	the Sweden case with a deeper analysis of strategies to circumvent the collective-action problem.	reference to a set of criteria defined by Ostrom (1990) to evaluate the common- pool regimes of the Swedish reindeer herders and to provide an assessment of the workability of the ex ante compensation scheme.	r c e o l s l e u c l t i v b e a s e d	on-ground survey (locals + zabel technician together) 2008	

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3 p a p e r	land Policy use Switz erlan d	payments for diversity on pastures	currently in 1st scheme r round: payments for e species-rich pastures as s surveyed at year 0; after u 8 years payments are l calculated on measured t improvements in b comparison to year 0.	on-ground (technician from local 2019 agriculture agencies on an agreed protocol)	survey zabel
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2 p a p e r	Ecological Economics India	on the basis of the outcome based payment for r carnivores in sweden, the paper presents a survey e on acceptability of a similar scheme for tigers s	on-ground (potential)	survey zabel engel 2010
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inter national that values carbon in standing trees. Tropical countries will be compensated for carbon that is stored in their forests as a result of a REDD+ project compared to a benchmark reference level. The more the rainforest countries reduce deforestation or forest degradation, or their forests store more carbon through various management and conservation activities, the more funding they shall receive.

REDD+ is a performance-based payment system that values carbon in standing trees. Tropical countries will be compensated for carbon that is stored in their forests as a result of a REDD+ project compared to a benchmark reference level. The more the rainforest countries reduce deforestation or forest degradation, or their forests store more carbon through various management and conservation activities, the more funding they shall receive.

in Skutsch, et al. 2011. REDD+ is considered a performance-based (Alternative model) for carbon payments to communities under REDDp: a comparison using the Polus model of inducements. Environment Science and Policy 14, 140–151.)

forest inventories (+ REDD+ remote) Reducing Emissions from Deforestation and Land Degradation NIBIO report