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**Long-term agreements and blended finance for
Landscape Recovery**

Rapid Evidence Assessment Report

Environmental Land Management Test and Trial

for DEFRA

March 2022

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Executive summary

This report explores the existing evidence relating to long-term agreements (LTAs) in agriculture and conservation, before examining the extent and state of private and blended investment. Specifically, it explores how agreements have been structured and the payment mechanisms that have accompanied them. Additionally, the report considers how private investment into long-term agreements may be secured, and the barriers and opportunities that arise in blended finance arrangements.

This report contributes to answering the following policy questions:

- How to construct long-term agreements (30+ years), potentially incorporating conservation covenants, to safeguard investments in land use change and associated environmental outcomes?
- How to blend public and private finance in funding projects?

By using a Rapid Evidence Assessment (REA) methodology, the report critically appraises the quality of evidence relating to LTAs and associated financial matters. We selected 54 pieces of evidence for in-depth critical appraisal. The strength of the evidence was assessed using two scores: relevance and robustness. Regarding the scope of the evidence, literature on agri-environment schemes (AES) dominates, reflecting the relatively long history of these schemes.

Results: Long-term agreements

Most evidence tends to assess factors motivating, or creating barriers to, participation in conservation covenants and AES; key here are studies addressing financial and administrative dis/incentives. There were also several studies focusing on collaboration, co-operation or co-ordination between land managers with respect to delivering environmental outputs. These are particularly relevant given that Landscape Recovery will require boundary-spanning agreements to be formed.

Covenants represent the most commonly addressed long-term agreement for conservation, with examples mainly drawn from Australia, New Zealand and the United States, with some attention given to England and Scotland. These are typically:

- Agreements made between a landowner and a conservation body to ensure the conservation of natural or heritage features on the land
- Private and voluntary arrangements made in the public interest
- Tied to land title and thus continue to be effective even after the land changes hands

Although the terminology varies by jurisdiction, the legal models for covenants tend to display similar essential characteristics. Covenants tend to have less flexibility than many AES agreements, but when a degree of personalisation is allowed, this is associated with slightly higher participation rates. Concerns over future land values, as well as issues of taxation relief, mean covenantors often require a large incentive payment.

Differing ownership structures impact participation in conservation programmes, with absentee and non-producer landholders being more likely to participate in schemes involving perpetual agreements such as covenants, than those who derive their primary income from their land. Thus, traditional production-oriented, single-ownership models are insufficient to understand the barriers and incentives to participation in conservation programmes. The evidence in this report shows that covenants tend to be attractive to a narrow subset of landholders only. This is instructive, as it suggests that one single type of agreement will not be suitable for the variety of landholders that may

participate in Landscape Recovery. Rather, a portfolio of short- and long-term contracts may offer greater environmental gains than using either type in isolation, although this is likely to incur higher implementation costs.

In addition, attitudes towards environmental and public goods are shown to impact individual decisions to covenant; the success of schemes is therefore, in part, dependent on the socio-cultural, ecological and institutional frameworks in which they operate. Successful programmes and effective policy instruments are those that are closely matched to these wider factors. Ultimately, the evidence suggests that environmental governance schemes must aim to generate a societal transition: this may reduce scheme costs at a later date, by encouraging the provision of environmental benefits as a routine area of land management practice.

Shorter-term agreements

Evidence relating to shorter-term agreements, especially studies of AES, predominates in the literature. Given the dominance of these schemes under current policy, there are many learnings that can be taken forwards when planning the delivery of LTAs at a landscape scale.

The evidence shows that the most successful agri-environment policies are those that:

- **Contain a suite of different policy instruments** to accommodate different geographical and environmental contexts, alongside the various needs, values and capabilities of different stakeholders.
- Have **tailored-management plans** for a holding – dependent on the land, its condition and the circumstances of the landholder. These appear to increase participation rates whilst being most effective in delivering environmental benefits. In particular, provisions for production and non-production landholders can be made. The evidence shows that scheme participation often rests on the financial conditions of each landholder, thus understanding individual's revenue stream requirements may be key to securing higher levels of participation.
- **Understand the requirements of different stakeholders**, making environmental agreements more legitimate and equitable for all involved.
- **Engage stakeholders in scheme design from the outset**, especially when agreements are to operate across land management boundaries, and over a longer term.
- **Give participants greater agency and control** to improve environmental and social outputs.
- **Build capacity**, particularly where agreements are complex, long-term and multi-party. The co-production of relevant and usable knowledge has been identified as particularly important in such agreements, and is likely to be most valuable when grounded in specific local contexts.
- **Employ bridging organisations** to help stakeholders reimagine and manage the landscape across geographic boundaries, by co-ordinating landholders and aiding discussions among stakeholders. They can also offer invaluable support to participants, ensuring agreements have continued success. Bridging organisations may come from peer-to-peer support networks, NGOs or charity organisations, private enterprise, or local and national bodies. Utilising help from these sources is shown to alleviate the time and monetary costs incurred by government.
- **Encourage co-operation and collaboration**; this will be especially important in cross-holding, long-term Landscape Recovery agreements. Examples of successful collaborative working particularly come from the Netherlands, where Environmental Co-operatives (EC) co-ordinate environmental land management contracts. The evidence demonstrates that giving non-governmental organisations such as these a high level of responsibility raises the quality and quantity of scheme outputs. In addition, overarching organisations such as EC can help

encourage and co-ordinate the joint submission of applications to environmental programmes. This can help spatially connect areas of land, overcoming fragmentation and enhancing ecosystem functioning at a landscape-scale. Thus, such organisations play a crucial role in addressing the scale mismatch that occurs between the spatial aspects of the environment and landownership and management.

Whatever form a **group of landholders** may take, they will likely require a longer time period for decision making than an individual. Furthermore, their administrative costs are likely to be higher. The literature recommends building extra allowances for these factors into programme design. There is a lack of research on group participation in conservation programmes, so there are few examples of how to incentivise group working, and how to structure agreements to better suit group tenders.

However, many pieces of evidence point to the importance of **trust** for collaborative working across boundaries to be feasible. **Social capital** is key here, where access to knowledge and support, shared values and the capacity to learn and innovate as a group have been identified as crucial to group success. Again, bridging organisations may play an important role here. Additionally, collaborative governance arrangements must be dynamic, especially when they are geared towards long-term management.

Across all types of agreements, **monitoring and evaluation** (M&E) are identified as key to participant satisfaction and scheme success. The evidence stresses the importance of precisely determining what outputs are desired under each contract, and how – including when, how often and by whom – these will be measured. The literature suggests that monitoring is carried out by individuals or groups trusted by land managers, so that scheme evaluation is seen as robust, legitimate and fair; local networks and organisations can play a key role in this. Monitoring regimes can be costly and complex, and metrics can sometimes fail to measure outcomes in an objective and repeatable manner. There is a need for strong statutory and institutional co-ordination and communication of environmental information at local, regional and national levels. Additionally, identifying the relationships between land management and environmental outcomes can be especially difficult when these take place at a landscape-scale. Monitoring must, therefore, take into account factors outside farmers' control, and beyond the farm gate.

In long-term agreements, **interim monitoring** of progress is especially important, to ensure the expected environmental benefits are delivered at the end of the contract. However, this may prove to be difficult in practice, given the length of time required for some landscape-scale benefits to take effect. The long-term nature of contracts must therefore be taken into account when evaluating the ongoing success of a specific contract or wider programme. In situations where access to information is limited – for landholders and authorities – environmental programmes tend to fall short of their intended outcomes.

Results-based payment schemes are particularly reliant on ongoing monitoring and access to information, as they rely on **adaptive management** and the capacity of land managers to innovate during a scheme. Evidence suggests that providing training for participants to improve their understanding of outcomes, as well as giving farmers greater freedom over land management actions, results in greater achievements with regards to intended environmental outcomes. Utilising existing networks for this capacity-building is recommended in the literature.

It should be noted that payment by results creates additional risk for land managers, as there is greater uncertainty in terms of the return on investment for management actions. Thus, it is likely that a larger incentive would be required to offset the uncertainty, as compared to a management-based contract.

The evidence recommends that schemes should reward the achievement of results above the cost of their delivery, making participation comparable to the profit margin of producing a market product. Additionally, long-term agreements are likely to require remuneration levels that respond to the shifting opportunity costs of various land management options, as well as to the increased time and money that may be required for administrative tasks.

Private investment and blended finance

The evidence relating to private investment and blended financing mainly comes from climate change and sustainability projects. However, there are several key areas in which the literature can provide recommendations that may encourage investment in Landscape Recovery projects, and aid their successful financing across the lifetime of a project.

Evidence covering private investment and blended finance arrangements mostly focus on investments related to climate change and sustainability. Of the 17 papers on blended finance reviewed here, 15 were dated from 2019-21; this emphasises the relative novelty of such approaches within agri-environmental management.

Evidence relating to blended finance and investment tends to focus on:

- How to encourage investment
- How to govern blended finance arrangements, with a focus on minimising financial risk and maximising returns for private investors

The literature shows that political and bureaucratic **uncertainty** are major barriers for private sector investment. Traditionally, the agricultural sector is considered as one of the riskiest for financial investment, and the business case for conservation investment is, as yet, largely unproven. In order to build confidence in environmental investments, governments need to take measures to improve the underlying **institutional framework**. Having a coherent national framework and policy environment that mainstreams investment in environmental projects can serve as a guiding force for greater investment. Additionally, encouraging a shift in investment from offsetting practices to impact investment promises greater environmental security for the long-term.

The evidence suggests that currently, many environmental programmes do not have a **clear and investible business model**. Some investment projects – especially those related to the delivery of public goods – are less attractive for the private sector because the benefit of these takes a longer time to materialise, and there is uncertainty around the market valuation of that benefit, especially on a short-term revenue basis. Institutional investors with long-term liabilities, such as pension funds and insurers, are more likely to have investment horizons that match the long-term horizons of Landscape Recovery projects. Alternatively, in long-term projects, returns to investors can be provided through contracts with government.

The literature also recommends that collaboration among multiple stakeholders can improve an understanding of the underlying benefits of conservation that may otherwise take time to materialise, or be intangible and difficult to measure. Crucially, it should be noted that the public goods provided by environmental projects are often localised in nature, with non-excludable benefits (i.e. benefits that are distributed among a range of stakeholders); both of these factors may be a disincentive to investment.

Providing adequate information to markets is crucial, and again, national governments must play a leading role in providing and distributing knowledge. Moreover, engaging potential investors in scheme design may help attract private investment, and can **build capacity across stakeholders**.

Successful blended finance models appear to require a multi-stakeholder partnership approach, where dialogue is fostered and all positions are well understood. Importantly, differences may occur between stakeholders in the perception of scheme effectiveness. When blended finance approaches are used, multiple metrics for scheme success may be required, to ensure associated rewards are paid fairly. As identified in the literature on agri-environmental management, *trust and inclusiveness* appear to be key to making blended finance arrangements such as *public-private partnerships* a success.

From the literature on private investment and blended finance, the key message is that blended finance models can help de-risk some of the challenges to private sector investment, by reducing risks and promising greater returns. However, blended finance approaches should generally only be thought of as a first step on the road to full private sector funding of environmental initiatives.

Summary

Interestingly, although the bodies of evidence had separate focuses, there was significant overlap, resulting in the identification of three key factors that appear to be vital for the success of long-term agri-environment *and* blended finance programmes: collaboration, minimising uncertainty, and monitoring and evaluation

Most evidence reviewed for this report tends to assess factors motivating, or creating barriers to, participation and investment in environmental schemes. Significant overlap was found between the two main bodies of literature in this respect. Disincentives to participation and investment may come from a range of factors, including those related to: uncertainty; financial concerns; administrative issues; monitoring and evaluation; and, broadly speaking, matters of co-operation, co-ordination or collaboration. However, the literature also offers solutions for overcoming such issues, and suggests instances in which they may in fact provide some incentives to scheme uptake.

When land managers and investors are aware of and better able to address the risks and barriers they face, participation increases. Tailored agreements – for agri-environment agreements and their financing – whilst incurring higher transaction costs, have a significant, positive impact on participation rates and can provide greater environmental benefits. Governments have a role to play in making the policy and regulatory environment conducive to engagement in long-term environmental agreements. Particularly pertinent to this report are the factors that relate to multi-stakeholder and long-term agreements, as these have clear relevance for the delivery of Landscape Recovery.

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1. Introduction

This report presents a review of evidence relating to long-term agreements in agriculture. In particular, it reviews literature that explores how such agreements have been structured, and the various payment mechanisms that accompany such agreements. Further, the report examines existing cases of the use of blended finance in agricultural and wider environmentally-focused projects. It considers what the best option for securing private investment into such projects might be, and how blended finance arrangements have been implemented in these cases. By using a Rapid Evidence Assessment (REA) methodology, the report critically appraises the quality of evidence relating to long-term agreements and associated financial matters.

The purpose of this work is to create a foundation for the Test and Trial's fieldwork phase. By reviewing the existing literature, the report can identify the relative strengths and weaknesses of various approaches to long-term environmental agreements, as well as the barriers and incentives to their uptake among farmers, landowners, land managers and other stakeholders. These, and any potential gaps identified in the literature, will be explored during the workshops and used to inform the production of possible scenarios around which long-term agreements can be developed. Crucially, this report – alongside the data gathered during fieldwork – provides key evidence that should be used to inform future policy decisions for the Landscape Recovery tier of Defra's Environmental Land Management (ELM) scheme.

This report is framed by the following of Defra's policy questions:

- How to construct long-term agreements (30+ years), potentially incorporating conservation covenants, to safeguard investments in land use change and associated environmental outcomes?
- How to blend public and private finance in funding projects?
 - What is the best implementation option for bringing in private finance?
 - How can payments be structured over the life of the blended finance agreement to allow land managers to achieve high quality and quantity of environmental outcomes while balancing stability of revenue and investor return?

This report should be considered as a living document, which will be iterated as new evidence on long-term agreements – especially conservation covenants – and blended finance emerges.

2. Methods

The methodology followed for this Rapid Evidence Assessment (REA) follows the guidance set out in the paper 'The Production of Quick Scoping Reviews and Rapid Evidence Assessments: A How to Guide' (Collins et al., 2015), which was jointly funded by Defra and the Natural Environment Research Council. The REA methodology is especially useful for identifying 'the characteristics of an evidence base' and then critically appraising the relevancy and robustness of that evidence (Collins et al., 2015: 2, 4). The REA was carried out systematically and objectively by research team members familiar with the material available.

Together, the research team developed keyword search strings, and criteria for evidence screening and for the scoring of the relevance and robustness of literature. As the REA process is iterative, pilot tests were performed at each stage to refine the methodology and ensure the validity of the final report.

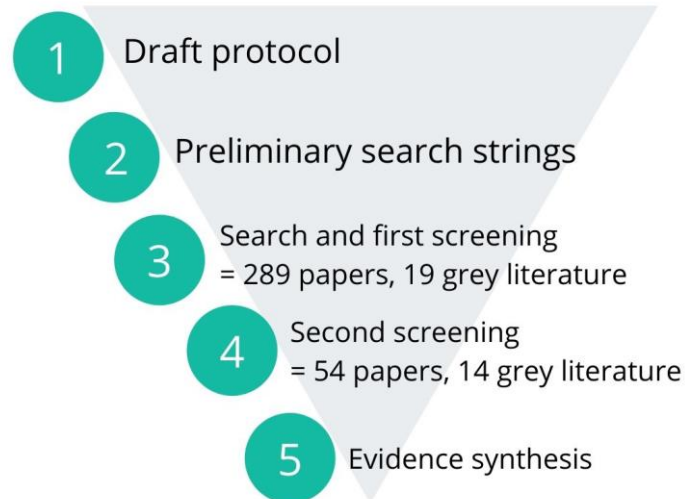


Figure 1: Overview of the protocol used for this Rapid Evidence Assessment

Protocol

The first stage of the REA entailed drafting a protocol, which was agreed upon by all research team members. The protocol specified the specific strategies and criteria for each stage of the REA. Importantly, it set out the methodology that would be used, to ensure the transparency and replicability of the search process. The protocol was revisited and iterated as the REA progressed.

Search strategy

The development of the keywords and search strings to be used for each of the four research questions was informed by the REA's goals and the research team's knowledge. A preliminary list of keywords, including common synonyms, was agreed upon by the research team and added to the draft protocol. Pilot searches were carried out with these in order to test their suitability in returning appropriate evidence for the review. Through an iterative process, some keywords were retained and others removed according to the number and relevance of returned search results, as judged by their title, abstract, and the research team's knowledge of the literature. Likewise, various combinations of keywords were trialled and refined to find the optimum combination for returning good quality and quantity of search results, without excessive duplication of records.

Peer reviewed papers were identified using searches conducted through Web of Science and Google Scholar. As Web of Science is recognised as a more authoritative source for peer reviewed papers, this was used as the primary source for data. Google Scholar was a useful supplement, especially as it also identified some grey literature, yet it should be recognised as an 'imperfect tool to perform systematic reviews' due to the search algorithms and personalisation that Google uses (Piasecki et al., 2018: 809). Some grey literature and unpublished material was also identified by members of the research team and their colleagues. Full details of the keywords and search strings used in the final searches are recorded in Appendix 1.

Screening strategy

Two phases of screening were carried out. Initially, search results were sorted by relevance. Where searches returned a large number of results, only the first 150 records from Web of Science, and the first 5 pages of results from Google Scholar were taken forward to the first phase of screening. All grey literature was screened. The first phase of screening involved assessing the retrieved material for relevance, based on the titles, and abstracts if required. This stage ensured that only the most relevant

literature was taken forward to the evidence analysis stage. Once duplicate sources were removed, a total of 289 peer-reviewed papers and 19 pieces of grey literature remained.

Following this, the recorded evidence sources were again screened for relevance, based on their abstracts. Each piece of literature was assigned a rating of green (relevant), amber (uncertain relevance) or red (not relevant) for each of the REA's four primary research questions. Similarly, each source was rated green, amber or red according to its robustness, with peer reviewed, empirical and methodologically sound papers given the highest (green) rating.

Critical appraisal stage

As there was a large number of sources recorded in the final database, only those that were deemed most relevant by the research team were taken forward to the critical appraisal stage. In this stage, papers ranked green – and where material was lacking, amber – for any research question, as well as green for robustness, were read in full. Very few of the sources imported to the evidence spreadsheet addressed all of the research questions, so when selecting the papers to read in full, a balance was sought to ensure an adequate spread across the research questions. In total, 54 of the highest scoring papers and 14 pieces of grey literature reached this stage.

Given that the REA centred on long-term agreements, their funding and the payment mechanisms attached to such agreements, the critical appraisal stage focused in particular on:

- Identifying existing examples of environmentally-focused long-term agreements in agriculture
- Considering how such agreements have sought to achieve a high quality and quantity of environmental outcomes
- Examining how payments to land managers have been made under previous and current environmental agreements
- Exploring existing uses of private and blended finance in agricultural and/or environmental projects
- Investigating attempts to ensure stability of revenue and investor return across the life of the blended finance agreement

The following chapter synthesises the evidence relating to these issues, and provides a thorough analysis of existing literature.

3. The evidence: volume and characteristics

Broadly speaking, the evidence fell into two main categories: papers relating to long-term agreements and payments for agri-environment measures, and those relating to blended finance¹. There was little overlap between these two main areas, reflecting the fact that to date there have been few examples of blended finance being used within agri-environment schemes (AES), although it has been attempted fairly extensively in climate and renewable energy focused projects. Within these two main groups, several subsets of literature were found:

- A number of papers examined long-term or perpetual environmental agreements, mainly with a focus on conservation covenants or easements; much of this literature drew on case study examples from Australia and the United States. Primarily, these explored issues related to the barriers and incentives that landowners face when considering such agreements.
- A large number of papers evaluated various AES and their associated payment mechanisms; these are usually based on shorter-term (5-10 year) agreements. Many examples here were based on case studies from European countries, including some from England, Wales and Scotland. The majority of these assessed the various schemes' impacts, analysing whether they could be judged to be successful from an environmental perspective, and sometimes including a consideration of whether they had contributed to practice change among farmers and land managers. Issues of monitoring and evaluation were also common within this subset of papers.
- Several papers explored collaboration, co-operation or co-ordination between land managers with respect to delivering environmental outputs. These mainly focused on case studies from the Netherlands, and are especially important when considering that Landscape Recovery will require boundary-spanning agreements to be formed. Some of these also considered the role of advisors or facilitators in the development and implementation of multi-party agreements.
- The literature on private investment and blended finance can broadly be divided into that focused on funding for renewable energy and climate change adaptation, and that focused on environmental projects (marine protected areas, afforestation) and agriculture; the latter of these tend to focus on case studies from developing countries.
- Within the private/blended finance literature, key areas of focus are: how to encourage investment; how to maximise investment returns; and how to govern blended finance arrangements. Interestingly, many of the recommendations in this area reflect those in the literature on conservation covenants and AES, particularly with regards to risk and collaboration respectively. Monitoring and evaluation emerges as a key theme across all the literature reviewed in this report.

¹ It should be noted that the private and blended finance papers have a date range of 2011-2021, with 15 of the 17 papers reviewed here being dated from 2019-2021; this emphasises the relative newness of blended finance approaches within environmental management.

4. Results: synthesis of findings

Long-term agreements for environmental protection: conservation covenants

Introduction

Long-term agreements are commonly referred to as conservation covenants (in Australia, New Zealand² and England), conservation easements (in the US), and conservation burdens (in Scotland). The variation in terminology reflects the different legal cultures in which they operate, but the legal models tend to display similar essential characteristics (Rodgers and Grinlinton, 2020).

These agreements are typically:

- Agreements made between a landowner and a conservation body to ensure the conservation of natural or heritage features on the land
- Private and voluntary arrangements made in the public interest
- Tied to land title and continue to be effective even after the land changes hands (Rodgers and Grinlinton, 2020: 374).

Primarily, existing research focuses on landholder motivations for the adoption of *perpetual* protection agreements (Capano et al., 2019). As such, they often explore the incentives and barriers to their adoption.

Capano et al. (2019) provide a summary of the peer-reviewed literature published on private land conservation (PLC), which they define as 'land under private ownership...managed to help achieve biodiversity conservation objectives'. At the time of publication of their review paper – the first to study research trends and gaps in PLC literature – they identified 284 scientific articles on PLC. Their review assessed where and when these studies took place, and what were the most commonly addressed conservation actions and policy instruments. The authors found that the literature on PLC has grown over time, with the number of articles published doubling after 2010. However, 78% of the articles focused on four countries only: USA, Australia, South Africa and Canada. Capano et al. (2019) note that the narrow geographical focus of most scientific literature available on conservation covenants is because these four countries have a long tradition of using such agreements for private land conservation. Within this, geographical differences were identified between programmes and agreements, but conservation covenants were the most addressed policy instrument (accounting for 73% of the studies), with matters such as property rights accompanying such content.

In these countries, easements have been used as instruments to aid with the conservation of both land and threatened species. Broadly speaking, literature from the USA context focused on property rights as related to easements, while studies from Australia addressed landholder motivations for participation in covenanting programs, along with the design and land management options that accompany them. In European-based studies, financial instruments were more frequently addressed than property rights, and there was a clear focus on landowner preferences and motivations in applying for voluntary conservation schemes (Capano et al., 2019: 194-5).

Crucially, most of the literature surveyed in this paper dealt with scheme implementation, but less than half of the articles addressed the ongoing management of land or contracts after initial enrolment (Capano et al., 2019: 195). The authors note that this apparent gap might be caused by conservation easements generally focusing on restrictive measures – such as preventing development or proscribing land use change – rather than fostering active stewardship or adaptive management of

² They may also be called 'open space covenants' in New Zealand.

land. Indeed, in England, section 8 of the National Trust Act (1937) allows landowners to make restrictive agreements with the National Trust (Landmark Chambers, 2020). These agreements are based solely on restrictions, with no positive actions within the covenant.

Rodgers and Grinlinton (2020) state that **the use of solely restrictive agreements is a major drawback** in the context of environmental management at the landscape scale, where positive long-term management of land is often required to deliver the widespread benefits desired. Hence, the Law Commission's proposals for changes to English law envisage new style covenants to be an agreement between a landowner and a 'responsible body' that would have responsibility for monitoring and enforcing the covenant. Responsible bodies could include public bodies, conservation charities, and 'for-profit' bodies with expertise in land management for nature conservation, such as community interest companies. The proposals also recommend that covenants should be able to establish positive as well as restrictive obligations, and that the beneficiary of a covenant need not hold adjoining land; this has important ramifications when the benefit is deemed to be a wider public good. In New Zealand, a management agreement may also be in place under a covenant, whereby payments are made to the landowner for carrying out agreed management actions (Rodgers and Grinlinton, 2020: 402).

Crucially, the Law Commission's proposals stress that **covenants need not be perpetual**, but could be for a fixed term only. Unlike New Zealand covenants, the Law Commission also proposes that English covenants should not be registered against land title, but should take effect as statutory burdens on land (Rodgers and Grinlinton, 2020: 392). They also recommend using a similar approach to Scotland, where a large number of agreement holders exist with a strong steer from government, with ministers responsible for determining which conservation bodies are appropriately placed to enter into such agreements (European Commission, 2012). As Rodgers and Grinlinton (2020: 391) note, this would ensure delivery of long-term environmental management and secure improvements made, whilst also providing an important incentive for landowners.

When covenants require positive management actions, such as the control of invasive species, these are formulated as a continuation of existing responsible land management practices, rather than representing significant changes to land management (Comerford, 2013: 176, 178). However, Comerford's (2013) research found that the ongoing management obligations implicit in covenants were off-putting for some potential participants. In particular, concerns were raised about the **financial and legal implications of ongoing management**. For example, if a covenant is in place in perpetuity, how will payment mechanisms associated with that covenant and its prescriptions operate? If the financial return is ongoing rather than merely upfront, is this also guaranteed to last for as long as the covenant?

Although covenants are often attached to land title and thus (usually) operate in perpetuity, Comerford (2013) stresses that their **impact on property rights may remain limited**: for example, a covenant may be very specific in the actions it restricts or necessitates. While conservation covenants are a well-established legal model in Australia, fixed-term conservation contracts have also become prominent through market-based conservation schemes; in the State of Victoria alone, 19 different forms of conservation arrangements exist (Lindsay 2016: 698). Covenants and contracts can be distinguished by the legally binding yet voluntaristic nature of their obligations. It is the permanence of covenants that increases the potential benefits they have to offer to conservation outcomes, when compared to shorter-term AES. Importantly, Comerford (2013: 176) also notes that they are more conducive to fostering a landscape-scale approach to conservation than short term schemes.

Management of conservation covenants

Covenants are usually managed by a national government, or an authorised non-government organisation. The extent of this management differs between jurisdictions, but commonly includes managing the legalities of establishing an agreement, and monitoring any management actions required by the covenant (Comerford, 2013). In the US context, Comerford (2013: 176) notes that covenants are widely used by conservation groups, as well as by federal, state and local governments, to promote biodiversity and restrict development on agricultural land; the majority of covenants here are designed to prevent fragmentation or development. The US has a highly established conservation covenant system; over 8.8 million acres of land were under these agreements in 2012 (Law Commission, 2012). Covenants in 28 US states are based around the Uniform Conservation Easement Act (1981), which sets out 14 objectives, of which entities wishing to form a covenant must meet one. These covenants do not have to be approved by a public body (Law Commission, 2012).

In England, section 5 of the Forestry Act (1967) allows covenants to be made with the Forestry Commission, for the protection of important woodland areas (Landmark Chambers, 2020). In Scots law conservation burdens can only be taken by a Scottish Minister or a designated conservation charity or body; this includes all local authorities in Scotland, the Scottish National Trust, Scottish Natural Heritage and charities including the Woodland Trust, Scottish Wildlife Trust and the Royal Society for the Protection of Birds (Rodgers and Grinlinton, 2020: 396). However, conservation burdens have not been widely used in Scotland, with an estimated 200 being currently in place. Here, burdens are perpetual, but will be extinguished if the burden holder ceases to be a designated conservation body.

In Australia, covenants are used principally as protective mechanisms, and may be included in incentive programmes as a tool to direct practice (Lindsay 2016). These agreements are used widely; in Tasmania alone, 810 covenants were established between 1999-2017 (Edotasmania, 2017). They are distinct in key ways from common law conservation contracts because they establish rights and obligations in real property, which can bind third party landholders such as successors in title to land. All subsequent transactions concerning the land, such as sale or bequest, are affected by the original transaction to covenant.

Also focused on Australian covenant law, Lindsay's (2016) paper analyses the nature and design of agreements used to achieve ecological protection on private land. The author states that conservation agreements need to be recognised as possessing both transactional and relational qualities. Table 1 provides comparisons between the two approaches. These different qualities should be considered and reflected in the design of agreements, and in practices of conservation management and agreement-making.

Transactional conservation agreements	Relational conservation agreements
Facilitate exchange of promises	Seek to maximise benefits from cooperation between parties
Less flexibility	Adjustment
	Flexibility between agreement and actual practice
	Accommodation of discretion/uncertainty

Table 1: Comparing transactional to relational conservation agreements (Lindsay, 2016: 700)

Lindsay (2016: 700) emphasises that the use of conservation agreements for long-term conservation or landscape-scale governance presumes a context of cooperation that makes them relational instruments. Moreover, long-term agreements such as covenants require a stable framework of

environmental actions between landholder and funding agency, in pursuit of the mutual interest of conservation outcomes (Lindsay, 2016: 700).

Since covenanted land often remains under the management of the landowner, the covenanting authority do not have the same level of ongoing management costs that would accompany their acquisition of the land through purchase (Comerford, 2013). Thus, the cost to the public purse is likely to be substantially lower in a covenant than in direct purchase of land, as only some property rights are being acquired. However, the in-perpetuity restrictions on land use and property rights that accompany covenants may increase the public cost relative to shorter-term management agreements commonly found in AES.

Barriers and incentives of covenants: financial considerations

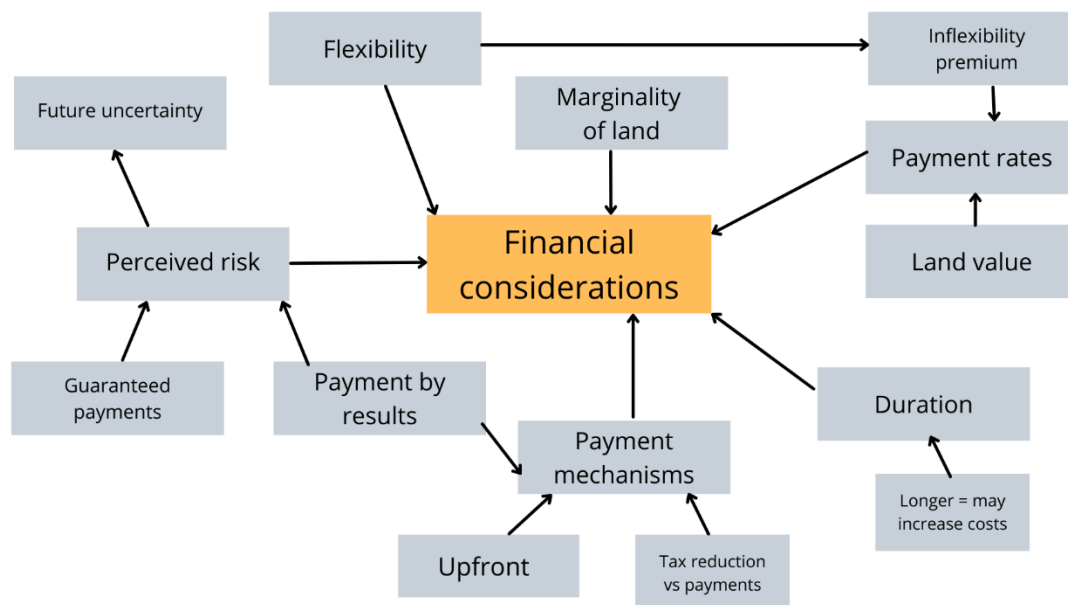


Figure 2: Overview of the topics which arose within literature surrounding financial considerations in relation to long-term agreements (conservation covenants).

Compensation for signing up to a covenant often takes the form of **cash payment or tax reduction** (Comerford, 2013). In the Cassowary Coast Conservation Covenant Rate Reduction Scheme in Queensland, Australia (Moon and Cocklin, 2011), landholders were given a reduction in their council rates (property tax) that was calculated by multiplying the percentage of the property under the covenant by a habitat classification score. Rate reductions ranged from 20-60%, and this was subtracted from the council rates payable each year. If a landholder withdrew from the scheme, they had to repay the Council for the number of years they received the rate reduction, up to a maximum of 10 years. In the USA, covenant uptake has been driven primarily by federal tax concessions on covenanted land (Rodgers and Grinlinton, 2020: 394).

As covenants reduce the **flexibility of property management** and must take into account uncertainty over their future impact, their inclusion in conservation schemes is likely to reduce participation rates (Comerford, 2013: 177). As Comerford (2013: 179) notes, this can have a negative impact upon scheme implementation costs, since covenanting authorities may be forced to choose from a limited

pool of applications, and thus competition between applications may be lacking. Further, landowners tend to demand higher compensation payments for longer (or perpetual) contracts, relative to shorter ones; Drechsler et al. (2017) term this an '**inflexibility premium**'.

Adams et al. (2014) studied a potential conservation programme in the Northern Territory, Australia, that sought to provide stewardship payments to leverage already extensive routine environmental management, to ensure its longevity. The programme would include covenants as well as management agreements. The paper suggests that because of their ability to secure permanent protection, the Government would rather engage landholders in covenants than management agreements. Indeed, it suggests they would pay a premium to secure this: 150% of actual stewardship costs, as opposed to 100% for management agreements. However, landowners participation rates are negatively correlated to an increase in contract length, with covenants being less accepted than fixed-term agreements. This reflects other research discussed here that reports landowner concerns with property title, land value and land use under a covenant. Moreover, as the proportion of property required to be under agreement increased, likelihood of participation decreased. In addition, Adams et al. (2014) found that smaller properties were more costly to engage, creating a tension between cost-efficiency and the delivery of landscape-scale benefits.

Comerford (2013) notes that the VIP attracted a fairly homogenous sub-set of the rural landholder community, who were not representative of the wider rural community. In particular, participants tended to be much more highly educated and with higher incomes than the average Queensland resident; Comerford (2013: 179) reports that 'typical' landholders did not apply to the scheme. Paralleling this research, Groce and Cook's (2022) study of Australian covenantors found that original signees were well-educated and older landowners, while successive owners tended to be slightly younger and with higher household incomes. However, in contrast to Comerford (2013), Groce and Cook (2022) found that original covenantors often earned less than the median Australian household income. One third of their research respondents executed a covenant for financial incentives, meaning extrinsic motivations to covenant should be carefully considered by policy makers.

As Comerford's paper studied a conservation auction, it was possible for the author to see the value that landholders placed on their own property. Following a model of bidding in conservation auctions (see Latacz-Lohmann and Van der Hamsvoort 1997, cited in Comerford, 2013: 177), the paper notes that participants' bids were made up of a valuation based on three factors: opportunity cost, information rent and a risk premium. Opportunity cost represents a valuing of alternate future uses for the land, generally based on its worth for agricultural production or real estate development. While the current value of sites is relatively easy to estimate, many forces can alter the future value of sites. Therefore, in order to make decisions that are robust to future change, conservation agencies must factor sources of **land value uncertainty** into conservation planning (Lennox and Armsworth, 2011). Information rent occurs when there is an asymmetry of information, allowing landholders to take advantage and be paid above their true costs (Comerford, 2013). Lastly, a risk premium takes into account the expected reward from participation, along with their expectations of success. The impact of the risk premium upon landholder decision-making and valuation of land will depend on the particular risk profile of each landholder, combined with the specific conditions of a contract.

Comerford (2013) states that more **risk-averse landholders** may be more willing to participate in a covenant program because it offers them a more guaranteed payment compared to uncertainty over future financial returns from the land. In this case, a covenant with a **large upfront payment** would be preferred to a shorter-term agreement with regular payments (Comerford, 2013: 177). This should be contrasted to Moon and Cocklin's findings, which show that landholders whose income is uncertain appear to prefer short-term programs that do not require significant changes to land use, as these are

seen as lower-risk (2011: 495). Lennox and Armsworth (2011) note that longer contracts tend to provide **greater ecological benefits**, but diminish the incentive for landowners to accept the contract. They recommend highly targeted conservation programs such as Higher Level Stewardship (UK), that account for ecological heterogeneity among sites, should involve longer contracts. In contrast, less focused and selective schemes could rely on shorter contracts. Importantly, Comerford (2013) notes that because **payment by results is deemed riskier** by landholders, outcome-based contracts are likely to be more costly for the covenanting authority than payment for ongoing management actions.

If participation in a covenant is believed to be risky, it is likely that landholders will seek a larger financial reward. Likewise, if a landholder has concerns over a covenant possibly negatively impacting land value, they may seek a greater amount of compensation. A common approach in the US when valuing permanent conservation covenants is to calculate the likely difference in the market value of land before and after the covenant. Generally, this results in a payment to the landholder of between 40-60% of current market land value, however research on Canadian covenants estimates payments are usually between 20-45% of land value (Comerford, 2013: 181). Comerford stresses that it is not the actual impact on land values that matters when landholders consider a covenant, but rather, the perceived impact. Moon and Cocklin (2011) found that one of the main barriers to participation in two Queensland covenant schemes was concern over impact on land value.

Comerford (2013) and Lennox and Armsworth (2011) also note that permanent agreements such as covenants are likely to be more expensive to implement than shorter-term arrangements. Comerford (2013) cites a study of carbon sequestration contracts (see Gowen et al., 2010, cited in Comerford, 2013: 177) that found increasing contract length from 20 to 50 years would necessitate a 50% increase in incentive payments, whilst participation rates would significantly decrease. Similarly, a study of the Australian Government's Environment Stewardship Programme found that agreements that included covenants cost on average 47% more per hectare than agreements without a covenant (see Binney et al., 2010, cited in Comerford, 2013: 177); the factors influencing this cost increase were not explored in the research. Comerford's own study of the VIP found that bids including a covenant cost 60% more per hectare than those without a covenant. This should be contrasted with Moon and Cocklin's research, that finds perpetual agreements reduce costs associated with agreement renewals and the recruitment of new participants (Moon and Cocklin, 2011: 502; see also Lennox and Armsworth, 2011: 2857).

Adams et al. (2014) found that properties that would be least costly to manage were also those least likely to participate. This positive correlation poses particular problems for the design of an incentive scheme. Similarly, Comerford's (2013) paper also raises questions over additionality, noting that many landholders who applied for a covenant were already committed to carrying out conservation actions. Moon and Cocklin's (2011) study notes similar concerns over conservation agreements in Queensland, given that landholders tend to contribute land already set aside for conservation, or land that is less suitable for production. Such findings may inform the design of incentives for conservation programmes.

Barriers and incentives of covenants: production vs. non-production landholders

Bond et al. (2018: 414) found that 55% of participants in the BushBids program were involved in primary production, and 77% were resident on their property. 34% of participants had an existing covenant on their land, and 25% signalled their intention to apply for a covenant; 44% neither had a covenant nor wished to apply for one. These figures reflect the results of other studies, which find that non-producer and absentee landholders are more likely to participate in conservation schemes involving perpetual agreements such as covenants, than those who derive their primary income from

their land. The large component of absentee landholders in this study confirms their relevance as part of the community of private land managers in agricultural landscapes, and aligns with other studies showing an increasing absentee ownership in various parts of the world (Bond et al., 2018: 416).

However, absentee landholders may face particular challenges regarding land management and program participation, including a lack of local information, difficulties in implementing management actions and time constraints surrounding site visits (Bond et al., 2018: 417). Bond et al. (2018: 416) also note that differing ownership structures – including absentee and group ownership – will often result in behavioural differences with regards to participation in conservation programs. Thus, traditional production-oriented, single-ownership models are insufficient to understand the barriers and incentives to participation in conservation programs.

Reflecting Bond et al.'s (2018) findings from the BushBids program, Comerford's (2013) study and Moon and Cocklin's (2011) research also concluded that non-production landowners were more likely to participate in a covenanting program. In the VIP, participants only used, on average, 27% of their land for production, and 63% of respondents reported over 60% of their income as coming from off-farm sources (Comerford, 2013: 179). Participants who withdrew from the VIP were usually those with a greater degree of agricultural production on their properties, and those farmers who did participate often required a higher covenant payment than those who did not use their land for production (Comerford, 2013: 181).

Moon and Cocklin (2011) differentiated landholders in Queensland, Australia, according to whether they derived income from the land or not (production versus non-production landholders). They compared these two groups to identify similarities and differences that could be used to inform policy in conservation program design. Based on interviews with 45 landholders participating in three different conservation programs, the research found production landholders were more likely to participate in shorter-term agreements that offered large financial incentives that applied to less than 25% of their property. Non-production landholders were more likely to participate in long-term programs that offered smaller financial incentives that applied to more than 75% of their property. However, non-production landholders usually received either a council rate reduction or a one-off payment for their conservation work (Moon and Cocklin, 2011: 499). Moon and Cocklin (2011) conclude that these results can be explained by the differing personal circumstances of production and non-production landholders. Their findings reflect those of Comerford's (2013) study, namely that an increase in income and education positively correlates with a greater degree of non-production landholding, and a greater level of participation in long-term agreements such as covenants. Many participants in the VIP reported joining the scheme for altruistic reasons, with nearly all saying that conservation motivated their decision to participate. In contrast, a stable source of income was the least common reason behind participation (Comerford 2013). This suggests that landholders who covenant are often predisposed to long-term conservation commitments.

Moon and Cocklin (2011: 500) also found that non-production landholders noted personal norms played an important role in shaping their views on how they should behave. This may be a key finding for policy designers, as it suggests that wider socio-cultural attitudes towards environmental goods may impact on individual decisions to participate in environmental programs. Indeed, Zaga-Mendez et al. (2020: 297) note that payment for ecosystem schemes (PES) are not created in an institutional vacuum, and their success depends upon the role of wider institutions responsible for guiding socio-ecological interactions, shaping human behaviour and influencing the use of natural resources.

Often experiencing less financial security than their non-production counterparts (Moon and Cocklin, 2011: 499), production landholders may be subject to financial pressures to improve the productive

capacity of their land; designating parcels of land for conservation activities may negatively impact this.

Barriers and incentives of covenants: management considerations

Groce and Cook's (2022) research sought to better understand the effectiveness of conservation covenants as a tool for ongoing environmental stewardship. The paper examines the relationship between Australian landholders' motivations to enter into a conservation covenant, and their current perspectives on covenants and management practices. Using questionnaires with a combination of quantitative and qualitative questions, they compared two groups of covenantors: those who initiated a covenant and those who acquired a property with a covenant already in place. The authors found little significant difference in perspective between the two. Namely, both groups showed strong pro-environmental perspectives, and the majority of landholders continued to undertake management activities for the benefit of biodiversity.

Only a small proportion of respondents were found to be dissatisfied with the covenant mechanism or provider (13% and 26% respectively), and this mainly consisted of successive owners and those who covenanted primarily for financial reasons. In addition, rates of satisfaction were lowest among those who entered covenants via regulatory and market-based mechanisms, such as those providing biodiversity offsets (Groce and Cook, 2022: 8). Using an open-ended survey allowed Groce and Cook (2022) to gain a nuanced understanding of the reasons for dissatisfaction. Themes included a lack of communication or support from the covenant provider, financial concerns, and the inflexibility of covenants. Notably, the authors stress that budget cuts and shifting spending priorities often reduce the resources available to covenant providers (Groce and Cook 2022: 7). This may lead to a disconnect between covenant holders and providers, and have a negative impact on expected environmental outcomes. Although initial motivations are important, the permanency of conservation covenants makes it essential to assess ongoing landholder perspectives on covenants and associated management obligations (Groce and Cook 2022). Particularly, owners who inherit a covenant may not hold the same environmental values as the original signee, may be less inclined to follow the covenant obligations, and may have less understanding of the properties' management needs. Considering the impending increase in successive owners as original covenantors transfer ownership of their properties, Groce and Cook (2022) note that maintaining covenant satisfaction among landholders is vital, and will ensure the longevity of covenants as a mechanism for positive conservation outcomes.

Fitzsimons and Carr (2007) evaluated the efficacy of conservation covenants in Australia and found that the key impediment to reaching biodiversity net gain was a lack of time resource to manage the agreement. In addition, they emphasised the importance of clear communication so that landowners are aware of exactly what's expected of them. Further barriers to achieving biodiversity outcomes through covenants included aging landowners, landscape threats, neighbours, payment rates (taxes), and a lack of integration with existing private land conservation schemes. It was also suggested that covenants could become linked with other incentives, thus offering long-term security for these investments (Fitzsimons and Carr, 2007).

The delivery of public goods

Rodgers and Grinlinton (2020) survey the use of conservation covenants in New Zealand, England, Scotland and Wales. In particular, the authors focus on the potential of covenants to secure greater public access to private land. Conservation covenants are a hybrid legal institution: private agreements which serve a public purpose, and which are neither wholly governed by private law principles or by public law (Rodgers and Grinlinton, 2020: 374). Due to the fact that they create perpetual obligations with regard to the land, they breach the limitations imposed in many legal systems on the imposition

of enduring restrictions on the use of land. Conservation covenants also go further than a common law covenant or easement, which can only be taken 'for the benefit of neighbouring land which the covenant touches and concerns' (Rodgers and Grinlinton, 2020: 374). This will not be the case for a conservation covenant, where the benefit to be secured is deemed a public good. While covenants taken over private land are usually only enforceable by those with the benefit of the covenant (e.g. a neighbouring landowner), as a statutory covenant, conservation covenants are enforceable by the 'responsible body' that holds the benefit of the covenant; this is often a conservation charity, government body or local authority. Rodgers and Grinlinton (2020) note that this makes conservation covenants more appropriate for delivering and securing long-term public benefits.

Drawing on empirical research from New Zealand and Scotland, and from their limited use hitherto in England, the paper considers the contribution conservation covenants can make to policy choices, such as where the optimal balance between land use objectives should fall, and the factors that influence this. It also considers the unique role that conservation covenants can play in giving legal expression to that balance in individual cases. The ability of a covenant to mediate tensions between public access, nature conservation and private property rights depends upon the legislative background for public access to land, and by regulatory conservation instruments. This will establish the balance between conservation, access and private property rights in each jurisdiction. While the authors caution against the transference of covenant policy from other jurisdictions, they highlight the relevance of Scots law and the extensive use of open space covenants in New Zealand; these influenced the Law Commission's 2014 (cited in Rodgers and Grinlinton, 2020: 376) proposals for covenant use in England and Wales.

Greater access to private land has underpinned the successful use of covenants in New Zealand, where public policy for nature conservation has been implemented alongside public access rights. The paper notes the successful balance that the New Zealand example has struck here. This has been achieved by the use of three types of covenants. Conservation Act covenants allow some public access alongside their conservation goals while Reserves Act covenants prioritise conservation and thus do not generally allow public access. These may also be used in combination, to take advantage of the strengths of both. Both Acts contain strong penalties for offences. In addition, open space covenants were introduced specifically to provide greater public access rights across private land. These are the most commonly used covenants in New Zealand, and are based upon a standard template that can be tailored to suit individual arrangements. This allows individual landowners to specify the public access conditions that they desire. Open space covenants are a very flexible model, and are also used to pursue a wider range of interests, including nature conservation and the preservation of landscape features (Rodgers and Grinlinton, 2020: 384). Once executed, they are registered against the title to the land, binding future owners. In return, landowners receive some modest financial and material assistance for matters such as fencing and pest control, and some land tax relief. The use of tax relief is one economic incentive commonly used for long term agreements, alongside subsidies and council tax relief (Law Commission, 2012). These incentives are used in the US, Canada, Australia, and New Zealand.

In New Zealand, the Minister of Conservation is responsible for entering into management agreements under the Conservation Act 1977 (Conservation Act and Reserves Act covenants), while the QE II NT is responsible for open space covenants (Rodgers and Grinlinton, 2020). The QE II NT has an annual target of achieving 100 new covenants, but receives more applications than can be supported by its funding. Some QE II NT covenants are secured as a condition of planning consent under the Resource Management Act 1991, for example to implement biodiversity offsetting as a

condition of development consent. Similarly, covenants may also be a requirement of the purchase conditions of land by overseas nationals or corporations, under the Overseas Investment Act 2005.

The covenant model proposed by the Law Commission for inclusion in the 2019-20 Environment Bill was primarily focused on promoting nature conservation and protecting heritage assets, rather than securing public access to land (Rodgers and Grinlinton, 2020). However, Rodgers and Grinlinton (2020) note that the New Zealand covenants, in their various forms, map onto the English government's stated desire to deliver more public goods from the land.

As covenants in New Zealand are intended to deliver 'public goods', there is a high level of oversight by public bodies and public consultation in the negotiation and conclusion of covenants. The Law Commission's proposals for England aim to strike a balance between public oversight and the recognition that covenants are private agreements. The performance of the covenant will be monitored solely by the responsible body that holds the covenant, with this body providing some information to the Department of the Environment. Rodgers and Grinlinton (2020) note that at the time of their article's publication, information on this reporting was lacking.

According to the Law Commission (2012), strict enforcement of conservation covenants should not be necessary; in the US, the vast majority of agreements have not required any compliance measures (also supported by Defenders of Wildlife, 2006). One example of a breach in the US was given by Anderson & Christensen (2005), where some landowners had profited from their covenants by using inflated appraisals to gain large tax write-offs. The Law Commission (2012) does, however, argue that the system in place for those rare breaches should be robust, as the consequences of non-compliance could be painful for the agreement holder to bear. They suggest that injunctions could offer a solution, whereby upon proof of a breach, courts should be able to issue a final injunction. It is also emphasised that the public interest should be the top priority above all else. They recommend that landowners should have to pay compensation and damages to the covenant holder where a breach is proven. The court should not, however, be able to award damages in substitution for an injunction (Law Commission, 2012); the Law Commission's recommendations are modelled on New Zealand's legislation (Rodgers and Grinlinton, 2020).

In conclusion, Rodgers and Grinlinton (2020: 377) state that conservation covenants have limited utility for the strategic implementation of public policy for the protection of landscapes, habitats or species; this is due to their private and voluntary nature. However, they can be a useful supplementary mechanism for promoting conservation management in landscapes that fall outside other statutory designation systems such as planning or development legislation. In addition, they could be used by a variety of covenanting bodies, not just by one body acting under statutory powers. Importantly, the authors note that at the time of publication, it was not proposed that new covenants in England and Wales would be supported by public funds.

Questions arise in the literature as to whether conservation covenants can successfully balance between different land use priorities in individual cases (Rodgers and Grinlinton, 2020). For example, it may not always be appropriate to allow too much access to a parcel of land, as this may compromise conservation values in a specific case. It may also impact and/or override private property rights (Rodgers and Grinlinton, 2020: 376). Existing schemes for public access such as those in place in England and Scotland often include restrictions and conditions, but these are sometimes difficult to enforce. A more nuanced approach is often required, and Rodgers and Grinlinton (2020: 382) believe that conservation covenants may be well suited to this role, as the balance between access and conservation can be individually adjusted in each case.

As most public access to covenanted land is permissive, this is an important motivating factor for those considering entering their land into a perpetual covenant. Individual covenant deeds establish the owner's prerogative on decisions as to individual access slightly differently. Examples include clauses requiring the owner to mutually agree conditions with the Queen Elizabeth II National Trust (QE II NT), or clauses giving the owner sole discretion. The ability to agree to flexible terms regarding access often makes a QE II NT covenant a more attractive option than a covenant with the Department of Conservation, where open public access is often obligatory (Rodgers and Grinlinton, 202).

Uncertainty, dynamism and in/flexibility

Lindsay (2016) emphasises that conservation covenants need to contend with the dynamism of ecological and social realities, and this may be accommodated in mechanisms for the adjustment of obligations between or within agreements. Sources of uncertainty, variability and risk may be human (changes to land ownership, economic cycles or management preferences for example) or non-human (climate-related events or shifts in ecosystem dynamics) in nature. As legal instruments, conservation agreements seek to establish certainty both in obligations and performance (Lindsay, 2016: 700). This is important in the need to control land use, monitor the delivery of environmental benefits and provide extended protections. However, tensions can emerge between pressures to adjust obligations and practices whilst providing legal certainty and coherence. Interestingly, Lindsay (2016: 700) stresses that the balance between legal certainty and adjustment to agreements may be more readily achievable under a multi-party rather than single-party agreement.

Bond et al (2018: 410) note that there is a growing body of research about factors that influence landholder participation in programs that incentivise conservation actions on private land. In their study of the BushBids conservation program in South Australia, they analyse participation in both shorter-term and perpetual conservation agreements. Most BushBids contracts are awarded for a period of 5 or 10 years, but alongside these shorter contracts, participants are able to include proposals for conservation covenants to be placed on their land. In this study, the covenants examined are Native Vegetation Heritage Agreements, binding agreements designed to conserve parcels of native vegetation on private land. These covenants establish legally prescribed, usually permanent land use restrictions on a piece of land, with the agreement being registered on the land title. Restrictions covered typically include those regarding the clearance or removal of native flora and fauna, prohibitions against introducing non-native species or fertiliser, and against the removal or disturbance of soil or rock. Whilst the shorter-term BushBids contracts have a greater degree of personalisation and flexibility, the covenants tend to be consistent regardless of location or ecosystem type (Bond et al 2018: 413).

Comerford's (2013) study of the Vegetation Incentives Program (VIP) in Queensland, Australia, sought to understand participation rates in a conservation auction in which mandatory covenants were included. Based on results gained from a census study and questionnaires, this research indicated that covenants – with their perpetual nature and attached proscriptions – reduced scheme participation rates, with 57% of potential participants to the VIP withdrawing when permanent protection was required. The research also found that covenants increased costs, since landowners required a greater financial incentive for such schemes than they did for voluntary and non-perpetual agreements.

The first round of the VIP included a very restrictive covenant that could not be varied between properties, and which had significant positive management obligations for the future. Very few tenders were submitted, and due to the high bid prices, no tenders were accepted into the scheme in this round. Due to these difficulties, more flexible permanent protection options were introduced for the two subsequent phases. Nearly all participants in these later phases elected to use a Nature

Refuge, a covenant managed by Queensland's Environmental Protection Agency. Importantly, these covenants allowed for terms specific to a property, but were still associated with low participation rates.

Groce and Cook (2022: 8) found that only 11% of respondents in their research cited the inflexibility of a covenant as a reason for concern, yet amongst these, successive owners raised this issue more often. Generally, complaints referred to landowners wanting more flexibility or autonomy when managing their land, or concerns that as their personal circumstances changed, the covenant was unable to accommodate such changes. The rigidity of covenants, whilst a strength in many regards, may also make them ill-suited to the changing conditions of landowners, properties or broader socio-economic factors. Groce and Cook (2022) suggest that compromises over permitted land use, or linking management plans to the covenant, may be ways to increase flexibility and build in a mechanism for periodic review. However, negotiations and changes in management plans still require agreement with covenant providers, which may be difficult to obtain.

Uncertainty and adaptation may be accommodated in agreements in different ways (Lindsay, 2016: 700). In shorter-term and action-based agreements, review provisions and renewal options can provide both measures for assessment and means for executing adjustments or discharging the contract as required. They may also include a force majeure clause for circumstances where the agreement's obligations could not be delivered. Longer-term contracts and covenants would more likely require mechanisms for adjustment and flexibility to be built into the terms of the agreement. Reform of perpetual agreements in order to accommodate dynamic conditions has been considered in the US, but such adaptive management requires stringent assessment and application of baselines, goals, indicators, threats and monitoring (Lindsay 2016: 701). The demanding nature of adaptive management makes it a preferred fit for schemes in which flexibility and innovation are required, especially those based on results. It would be less appropriate for covenants, especially where they are restrictive in nature and management is prescriptive to match this. The Law Commission support this, stating that long-lasting obligations have to incorporate some flexibility to avoid land becoming 'sterilised' (Law Commission, 2012). Additionally, Wheeler et al. (2021) recommend that long-term agreements should contain contingencies which account for significant shifts in farm businesses. These shifts may include succession, retirement, sale of land, and market shifts which affect the viability of a farms' current activities.

Modifications and discharges to covenants

Much of the literature surrounding LTAS provide recommendations or examples of what should happen where modifications to existing agreements become necessary. For example, Hamilton (2013) sought to explore how the US could go beyond conservation easements, and questions what should happen if a business fails, where there is a change in ownership, or where a land-owner becomes unable to manage the land (e.g., due to old age, illness, impairment).

In the US, modifications and discharges of conservation covenants are controversial and use common law doctrines. As outlined by the Law Commission (2012), the circumstances which may lead to modification or discharge may include:

- Abandonment by the holder
- A merger, whereby the holder purchases the land
- Estoppel, whereby the landowner goes through a detrimental change of position and the covenant holder does not seek to enforce the agreement
- Prescription, where the agreement has been breached

- A change in conditions, whereby the covenant is no longer practical for achieving its original goals (allowing modification). Where it becomes an impossibility, this may offer grounds for full discharge

Where the above situations arise, court orders often become necessary (Law Commission, 2012). Lindsay (2016) states that dispute management as a field of practice and drafting requires greater attention in the literature. Moreover, he believes that dispute management is not well thought out or clearly dealt with in many conservation agreements. Disputes provisions should be adaptive and appropriate for long-term conservation actions, and should include scope for graduated, independent, corrective and fair arrangements, informed as necessary by expert input Lindsay (2016)³. Indeed, Herzon et al. (2018) note that a robust system of dispute resolution helps increase farmers' confidence when it comes to participation in schemes.

In Tasmania (Australia), there are few safeguards within legislation to secure long-term protection within covenants (Edotasmania, 2017). This is a worrying prospect as many covenants are likely to need modifying or discharging in coming years as these agreements mature or where circumstances change (e.g., where land is sold). In response, Edotasmania (2017) recommend that a covenanting body similar to the Queen Elizabeth II Trust in New Zealand is formed, and that covenants should be modifiable where the minister is content that the changes won't have negative implications for the natural or cultural values on the land in question. In most situations, this report recommends that ministers may demand repayment of the compensation paid to landowners where a covenant is discharged or where the requirements are reduced.

Given the importance of constructive relationships in private land conservation programs, Lindsay (2016: 701) stresses that disputes should be managed within the framework of the agreement, rather than by litigation through the courts. In addition, disputes management may be a source of corrective action or adjustment of obligations, rather than a matter of damages or legal remedy. Importantly, Lindsay (2016: 701) notes that disputes may not be 'bipolar', but might involve or affect a wider community of interests not directly party to the agreement in question, such as adjacent landholders or other conservation program participants. Further work on the modelling and testing of dispute management and adaptive agreements is recommended by the paper. In general, covenants have proven to be highly secure agreements because they require the assent of all parties to be revoked (Groce and Cook, 2022).

³ Graduated dispute handling may range from informal resolution through to arbitration. Third parties involved in dispute resolution should be independent, competent and impartial, with expertise appropriate to the dispute. Agreements should include clear default and remedy clauses, along with force majeure provisions. Dispute resolution should be cost-effective, fair, and have regard to the economic circumstances of all parties (Lindsay, 2016: 701).

Country	Management of modifications/discharges
USA	Varies between states but generally common law doctrine. Court orders are often required
Scotland	Lands Tribunal for Scotland holds the ability to modify or discharge agreements where it is reasonable to do so.
Canada	Largely unrestricted, aside from two statutes that require government approval. Modifications and discharges are, however, uncommon
Australia	Only public authorities can hold conservation covenants so a court order is needed for modifications/discharges
New Zealand	Similarly to Australia, a court order is required for modifications/discharges
England	National Trust covenants are silent on the subject, implying this is open to the parties. They do not hold any special powers for monitoring or enforcing covenants. The Forestry Commission?

Table 2: How modifications and discharges from conservation covenants are managed in other key countries (information from Law Commission, 2012).

Summary

Understanding landholders' willingness to participate has two important implications for landscape-scale environmental management. Firstly, it helps shape policy design: for example, showing the impact that land management activities, constraints on land title or incentives have on participation rates (Adams et al., 2014). Secondly, it can help identify landholders willing to participate, which is vital for assessing the likely spatial configuration of schemes. If spatial planning is integrated into scheme design, schemes can be more targeted and thus can maximise environmental benefits more cost-effectively.

Although she cautions against making generalisations regarding types of landholders who participate in environmental incentive programmes, Comerford (2013) notes that some property characteristics appear to consistently and positively influence willingness to participate. These include the size of the land holding, the security of tenure, and a more accepting community including high levels of trust. This reflects other studies that emphasise the importance of socio-cultural factors on landowners' willingness to enter into AES.

Programme characteristics that appear to consistently encourage participation include appropriate levels of financial assistance and reward, clear information about the scheme, flexibility of proposed management actions and low transaction costs (Comerford, 2013). Combined, these factors should ultimately reduce uncertainty and risk for landowners. Importantly, Comerford (2013: 179) notes that 37% of participants who withdrew from the VIP scheme cited the complexity of the scheme as a key contributing factor to their withdrawal.

Shorter-term schemes for environmental protection: AES

Introduction

A large body of evidence concerns agri-environment schemes in their various forms, including one paper that analyses the evolution of different schemes (see Franks, 2019). Of the main bodies of evidence covered in this REA, this one is the most established area of study, providing the largest number of papers for review. It also includes the widest temporal span, with papers from 2006-2021 being included in this report. Primarily, the evidence base reviewed here draws from European scheme examples.

AES are typically conceptualised as public economic instruments derived from a state bureaucratic program, which aim to provide coordinated ecological action (Zaga-Mendez et al., 2020). Unlike conservation covenants and easements, the AES covered here are put in place for a limited period of time only, typically a maximum of 10 years. The focus of such studies is commonly the schemes' impacts in terms of environmental outcomes and, occasionally, in terms of behaviour changes in the land managers who participate in these schemes. Other foci include assessments of the payments associated with AES, and of the monitoring and evaluation of schemes; these matters are obviously related to each other, and some papers therefore cover both aspects.

In a time of increased environmental targets, and with an increasing squeeze on government budgets, the focus of PLC literature has shifted from a concentration on the details and effectiveness of conservation programs, to studying the national and international policies that lie behind their instigation; this also includes an increased focus on the instruments required to implement schemes and comply with national and international targets (Capano et al., 2019: 195). Capano et al. (2019) emphasise the need for future studies to analyse stakeholder engagement in PLC, especially across sectors; future research should therefore focus on understanding how the engagement of different stakeholders can potentially promote legitimate and equitable PLC policies across different geographic and temporal contexts.

Trends towards landscape-scale agreements in UK AES

Franks (2019) reviews the evolution of AES offered to farmers in England between 1979 and 2015, from the perspective of their potential to deliver landscape scale environmental benefits. Using population conservation theory – which underpinned the recommendations in Lawton et al.'s (2010) report – he identifies the key characteristics of schemes with this potential. In turn, these characteristics are compared to Countryside Stewardship (CSS), which at the time of Franks' publication had been the most landscape-scale oriented AES offered to farmers in England. A consideration of scheme evolution enables Franks to discuss how changes to key AES characteristics may influence how landscape-scale schemes could work in the future.

The characteristics of AES that Franks (2019) focuses on are those which: ensure the land entered into the scheme is of 'an adequate size' to deliver landscape scale benefits; ensure long-term protection; and help reduce fragmentation. Environmental Sensitive Areas (ESA) were introduced in England in 1987, and whilst agreements were individual in nature and restricted to small, clearly defined geographical areas, the scheme was designed so that all agreements within an area targeted the delivery of the same regionally-specific environmental benefits. Rather than encouraging farmers to work collaboratively, this was an example of a coordinated scheme. However, on moorland, all 'rights holders' were required to participate, with a single environmental management application being submitted alongside an Internal Agreement which recorded each stakeholder's individual contributions. In practice, these requirements were difficult to fulfil, and many ESA moorland agreements were only concluded by Natural England waiving the need for all stakeholders to be

included in the application (Short, 2000, cited in Franks 2019). The requirement for neighbouring farmers to interact makes moorland ESA an example of a collaborative scheme.

The Wildlife Enhancement Scheme (WES), in operation from 1992-2008, was designed as a flexible and site-specific scheme. Under this scheme, compensation payments were agreed on a farm-by-farm basis. However, like ESA, when WES involved common land, a single submission was required that had the full agreement of all rights holders. When this proved impossible, agreements were allowed as long as all active graziers were involved (Franks, 2019). Franks (2019) notes that WES's legacy for landscape scale management is the precedence they set in making additional financial payments to fine-tune and top-up existing AES payments.

The Upland Entry Level Stewardship (UELS) tier of the Environmental Stewardship Scheme (ESS) has important pointers for landscape scale approaches because of its active encouragement of collaboration, through the UX1 option, which paid £5/ha/year. Crucially, UX1 was compulsory for all upland farmers who farmed land jointly with others; this would have applied to the vast majority (Franks, 2019: 151). The HLS option HR8 encouraged land managers to actively collaborate, by rewarding neighbouring farmers for the management of 'boundary spanning eligible environmental features' (Franks, 2019)⁴. Unlike the UX1 option, under HR8 farmers submitted individual applications that included boundary spanning activities. Whilst this made it more flexible than committing to a joint agreement, HLS was a competitive scheme and therefore, in many ways, disincentivised neighbouring farmers to discuss their applications with each other.

Franks (2019) states that the Mid Tier of CSS has the most landscape-scale innovations. This has two incentives to encourage collaboration across holdings. Firstly, the Facilitation Fund supports bridging organisations, providing administrative costs to those organisations that help Farmer Groups⁵. The bridging organisation receives an annual payment for the duration of the award (three or five years). Thus, Farmer Groups are conceptualised by the paper as a hybrid entity, involving both active farmer-farmer collaboration and passive, third-party coordination from a facilitator (Franks, 2019: 156). Secondly, applications from Farmer Groups receive a 20% enhancement to their Basic Score, thereby increasing their chances of their application to this competitive scheme being funded. Crucially, Mid Tier drops the requirement of a single application supported by an Internal Agreement. However, it still contains weaknesses that can pull against collaboration; for example, the requirement for Farmer Groups to have at least four members, and for them jointly to farm at least 2,000ha. Franks (2019) asks why this must be the case when not all of this land must be entered into a CSS agreement. These reductions to scheme flexibility, coupled with the Facilitation Fund awards being only three or five years in duration, make it harder to secure the long-term benefits sought by landscape scale agreements.

In summary, Franks (2019) identifies four trends in AES design that have key implications for how future schemes are designed to deliver landscape-scale benefits. These are shown in Table 3.

⁴ More information on HR8 is given below, pp. 38-39.

⁵ A Farmer Group must consist of four or more neighbouring farmers, who between them farm over 2,000ha. Each member must submit an individual application to CSS, but each application must demonstrate that it will offer greater benefits than the land manager could whilst working alone. After the 2017 round of applications, 98 Farmer Groups had been funded by CSS, involving 1915 farmer members across over 450,000ha (Franks, 2019).

Trend in AES design	Implication for Landscape Recovery	Possible Solution
Basis of compensation payments	Output-related payments increase risks for farmers, especially in longer-term agreements	Ongoing M&E of schemes
Targeting incentives for collaboration across landscapes	A more joined-up approach will be required by LR	Ensure incentives encourage collaboration and that structures support this
Increased administrative costs	High transaction costs are likely to be involved when using collective, bespoke agreements	Utilise existing networks wherever possible
Increase in compulsory elements	Greater inflexibility, especially in long-term agreements, is shown to reduce participation	Agreements should remain as flexible as possible, to attract high participation in collective action across holdings

Table 3: Trends in AES design identified by Franks (2019), their implications for Landscape Recovery agreements, and possible solutions

Crucially, it has been shown that it is the number of stakeholders and their range of interests, rather than the area of land covered, that are the major determinants of transaction costs within a cross-holding agreement (Franks and Emery, 2013).

Spatial differentiation within schemes

Harkness et al. (2021) examined data from 2333 English and Welsh farms, from 2007 to 2015, to study the effects of agri-environment payments on the stability of farm business income. They show that engagement in AES generally increases the stability of many farm businesses, whilst simultaneously reducing negative impacts of farming on the environment. The authors suggest that it could be the impacts of the environmental practices undertaken in an AES that have a significant impact upon farm income stability, rather than the payments themselves. In particular, an increase in agricultural diversity and a reduction in the intensity of inputs may be especially impactful. These tend to maintain and stabilise yields, increase pest and disease resilience, and reduce the effects of environmental and climate hazards. The paper recommends further research to identify the specific environmental management practices that contribute to stability of income, across different farm types and landscapes.

Also using data from Welsh farms, Arnott et al. (2019) analysed the ways in which the Glastir AES's continued focus on productivity support runs counter to the promotion of environmental sustainability. Glastir contracts show a strong uptake bias: over 75% of all advanced level management contracts consisted of only 15, out of a total of 165 management options. This bias in option uptake encourages a 'business as usual' approach but negatively impacts on the scheme's ability to deliver ecosystem services. Moreover, it limits the scheme's ability to promote long-term behavioural change.

While Glastir payments seem to be spatially distributed to the areas more suited to the delivery of ecosystem services, the research shows that 84% of recipients received only a 35% proportion of the total available funding. Thus, the majority of payments go to bigger and richer landowners. It could be argued that, in order to achieve landscape-scale impacts, this uneven distribution of payments is justified as these landowners may be most able to deliver ecosystem benefits on a larger scale. However, Arnott et al. (2019) note that many continue to deliver scheme outputs on a field-scale level only, making the scheme ineffective at delivering wider benefits. In addition, the five-year term of

Glastir contracts impacts upon long-term benefits. Thus, the authors conclude that the effectiveness of the Glastir AES on a temporal scale is significantly impaired by the spatial scale of its delivery.

Armsworth et al. (2012) studied the relationship between the spatial differentiation of AES and their cost-effectiveness, using ecological-economic models on 44 extensive grazing farms in and around the Peak District, UK. The article examines the trade-off between inefficiencies associated with over-simplified policies, and the administrative burden of implementing more complex designs. The authors built an integrated model of biodiversity change and farm production choices, allowing them to estimate a farmer's private costs of enhancing a biodiversity target in relation to associated foregone farm profits (i.e. the true supply price of biodiversity). The AES available to the farms studied – ELS, HLS and Hill Farm Allowance – gave most farmers between 54-88% of payments as pure subsidy, rather than income foregone. However, these payments kept a number of farms in business, thus preventing land abandonment.

Armsworth et al. (2012) find that failure to differentiate prices spatially is especially inefficient. An optimal policy design would involve preferentially allocating conservation contracts to areas where biodiversity enhancements can be provided relatively cheaply. In addition, using sliding payment rates that vary across regions and with the amount of biodiversity produced adds to scheme cost efficiency. Specifically, no surplus should accrue to farmers under such a scheme, and any inefficiencies would be a result of the failure to allocate contracts preferentially. Common policy simplifications – no sliding payment rate, no price variation within regions and no preferential allocation of contracts – result in a 49-100% loss in biodiversity benefits for a given level of investment relative to the optimal policy, depending on the conservation indicator chosen for measurement. Furthermore, the paper calculates the upper bounds of implementation costs that it would be worth bearing to avoid such policy simplifications. It determines that the additional implementation costs that accompany more complicated policies are worth bearing even when these constitute a substantial proportion (70% or more) of the payments that would otherwise be given to farmers.

When more than one environmental target is aimed for, scheme costs tend to increase. Yet when these are closely correlated with the land management actions required to achieve them, schemes may break even (Armsworth et al., 2012: 409). However, the paper stresses that when more than one target is sought, it is still much more effective to include these in scheme design, rather than rely on an 'umbrella' approach which hopes for ancillary benefits to arise from one conservation target.

Zaga-Mendez et al.'s (2020) research on AES in Quebec, Canada, notes that the privately-run ALUS scheme adjusts payments offered to participants based on both the market land values in their particular area, and the calculated ecological value of the project. Whilst increasing complexity in the design stages of a scheme, such tailored approaches may help deliver better value for money for those investing in a project – whether public or private funds – and may also ensure participants feel adequately rewarded for their participation, thus enhancing scheme uptake.

Franks and Emery (2013) detail alternative approaches to landscape-scale management within formal AES. The authors note that extending approaches from the UK's existing AES – such as relying on a wide uptake of agreements or targeting them geographically – would be less costly and complex than introducing innovative, collaborative approaches that require landscape-scale plans and an increased involvement by authorities. However, the paper suggests alternatives to the extension of existing strategies to improve the chances of success at a landscape-scale. In particular, it recommends encouraging the development of farmer led groups, to aid the coordination of environmental management across holdings. Also, the paper notes that the combination of approaches adopted is likely to be region-specific, as it will depend upon the existing spatial configurations of an area. It

recommends that payments are related to the number and diversity of stakeholders involved, with larger per hectare payments made to smaller area schemes, as these are often proportionately more expensive to manage. In addition, since the transaction costs of multi-party agreements are higher, they should be supported by higher compensation payments, a proportion of which should be paid up-front (Franks and Emery 2013: 858).

Local knowledge and adaptive management

It has been noted elsewhere that a less prescriptive scheme is likely to deliver a higher quantity and quality of environmental outputs (Franks and McGloin, 2007a: 238). Encouraging farmers to use their specific local knowledge to generate innovative methods of producing environmental benefits may offset some of the problems related to AES. Mack et al.'s (2020) analysis of Swiss AES demonstrates that farmers' local knowledge and competences are especially important in result-oriented and multi-party agreements. Similarly, Franks (2016) notes that existing literature on collaborative agri-environment working identifies clear benefits to those farming groups that employ a project officer with good local knowledge; in addition, these facilitators should be used at every stage of a scheme.

Drawing on the example of the UK's ESS Higher Level Scheme, the Franks and McGloin, 2007a) note the strengths of combining flexibility regarding management actions with local knowledge of the land and farming system. This allows land managers to fine tune their practice (so-called adaptive management) in order to off-set variations in conditions, both spatially and temporally. This may be particularly important for Landscape Recovery long-term agreements, which will likely require ongoing re-assessment of land management.

Indeed, Herzon et al. (2018: 350) write that successful results-based AES require, above all, local-scale knowledge about economic, social and ecological circumstances (see also Cooke and Corbo-Perkins, 2018: 178). State-centred and expert-led approaches have been shown to be insufficient in generating the societal change necessary for long-term environmental management changes (Dedeurwaerdere et al., 2015: 25). Long-term agreements may have a particular need for adaptive management, as cycles of management and evaluation allow learning to be incorporated into future land management practices. Adaptation can also help mitigate the effects of environmental change and uncertainty, and learning from results has been shown to be essential to scheme success (Westerink et al., 2017: 177). Westerink et al's (2017). Ongoing monitoring and evaluation is therefore vital to adaptive management.

Monitoring and evaluation

Interim monitoring of progress may be especially important in long-term agreements, to ensure the expected environmental benefits are delivered at the end of the contract term, yet it may be particularly difficult given the length of time required for some landscape-scale improvements to take effect. Issues of what is measured, how and when will be of primary importance in these cases. The long-term nature of contracts must be taken into account when evaluating the ongoing success of a specific program.

Prager et al. (2012) note that M&E of schemes should be made clear in advance, and steps taken to ensure measurements can be carried out at reasonable cost. Indicators will need to be revisited if experience with the scheme shows them to be inappropriate. The capacity of the administering authority will be one of the limited factors in determining what kind of objectives can be set and monitored; Moon and Cocklin (2011) emphasise the need to consider the capacity of local and regional agencies to monitor conservation programs on private land. The authors note that monitoring regimes can be expensive and complex, and that the metrics used for monitoring can fail to measure outcomes in an objective and repeatable manner (Moon and Cocklin, 2011: 502). However, Prager et al. (2012)

state that not all tasks need to rest with the administering authority. In a collaborative scheme, Prager et al. (2012) emphasise the benefits of considering collaborative approaches to monitoring. A partnership group could be established, for example, to facilitate knowledge exchange and scheme promotion, alongside monitoring. An existing group or network would be an excellent partner to share this task (Prager et al., 2012). Examples of this approach come from Landcare in various countries, and Environmental Co-operatives in the Netherlands. This may reduce the overall cost of data gathering and evaluate success more effectively. In particular, multi-party feedback loops enable fine-tuning of a scheme in line with the ideas of adaptive co-management.

Herzon et al. (2018) also point to the value of having indicators that land managers can monitor themselves, because it allows ongoing assessment of one's performance and facilitates adaptive management. In order to offset possible monitoring problems, Franks and McGloin (2007a: 238) recommend involving farmers as partners in the design of contracts, rather than merely imposing solutions on them. Similarly, they emphasise the need for monitoring and evaluation of schemes to be carried out by individuals or groups who are trusted by farmers (Franks and McGloin, 2007a: 242). This question of the legitimacy of those involved in scheme evaluation is raised by other research too, including literature related to private and blended financing of schemes.

Some EC carry out ongoing monitoring of outputs on behalf of their members, to ensure farmers stay on track with their contracted targets. This interim monitoring enables changes to land management practices during the contract where necessary, and aims to ensure better environmental outcomes. Yet not all EC are in a position to carry out such monitoring: some do not have the financial, personnel or technological resources required, leaving farmers uncertain as to how their environmental land management is progressing. Similarly, in the ALUS program in Quebec, Canada, annual payments to farmers are made on the basis of an annual inspection of the funded project (Zaga-Mendez et al., 2020); if the long-term success of the project is compromised at any stage, a mutual agreement with regard to the actions necessary to rectify non-compliance might be established between the farmer and the authority overseeing the contract. Zaga-Mendez et al. (2020) note that although the scheme has well-established processes to ensure compliance with scheme rules, the programme falls short when it comes to the ecological monitoring required to evaluate scheme success.

Results-based payment schemes

Results-based payment schemes create additional risk for farmers (Franks and McGloin, 2007a). This is related to two factors: the economic uncertainty created by not having a known, fixed payment sum at the end of a scheme; and uncertainty for farmers in terms of their return on investment for the management actions required to produce the contracted outputs. Thus, it is likely that participants in RBP schemes will require a larger incentive, to offset these uncertainties.

Lennox and Armsworth (2011) write that agreements focused on living species may be more suited to payment by results than other conservation goals, yet Franks and McGloin (2007a) identify several potential problems related to payment by results when this is based on living species rather than tradable quotas. These include: identifying the production relationships between agriculture and the environment; the time lag between actions and outcomes; and the impact of factors outside farmers' control and beyond the farm gate (e.g. weather conditions, species migration) (Franks and McGloin 2007a: 238). Some of these factors are clearly applicable to many schemes, no matter what type of environmental output is being sought. However, payment by results does provide quantifiable outputs that can be used to assess the cost-effectiveness of such a scheme.

Herzon et al. (2018) analysed all schemes paying for biodiversity outcomes on agricultural land operating in EU and EFTA countries, to determine the challenges and opportunities of adopting a

results-based approach. The authors note that about half of these schemes come from Germany, which has the highest number of federal government schemes and the longest experience with the approach. Using evidence from peer-reviewed literature, technical reports and interviews, they developed a typology of the schemes and explored critical issues influencing the feasibility and performance of results-based schemes. The paper identifies a pattern in schemes, relating to the extent to which schemes' 'payment' and 'control' mechanisms are dependent on a priori specified biodiversity outcomes. This pattern shows an inverse relationship between the two, where pure results-based payment (RBP) schemes specify detailed conditions for payment, yet rarely specify the land management actions that are required to achieve this. Conversely, AES paying for actions often contain highly detailed management plans but are less focused on the actual results of such management. Most RBP schemes studied by Herzon et al. (2018) were of the hybrid type, in which some management conditions were applied even if the payment was wholly dependent on results. This may reflect the fact that not all biodiversity aims can be practically measured through indicators.

RBP schemes are reliant on adaptive management and the capacity of land managers for innovation during scheme design and implementation. Herzon et al. (2018: 348) state that this, in turn, requires the development of multi-party governance systems and experiment-driven environmental policy. Some RBP schemes provide training for participants in order to improve understanding of scheme outcomes, and give farmers greater freedom over how to achieve them⁶. Fine-tuning the scheme is best achieved during its pilot phase, which Herzon et al (2018: 350) note is true of any novel method of policy delivery. RBP schemes may therefore be better suited to maintaining existing habitats that are in good ecological condition and where land managers can draw on their experience, rather than situations where conservation measures are unfamiliar to land managers. Crucially however, the paper stresses that in such cases there may not be a sufficient incentive for land managers to participate in a RBP scheme, if the payment threshold is determined by the average situation. Sustaining participation levels in schemes requires remuneration levels to respond to the shifting opportunity costs of various land management options, as well as to the time and money required for administrative tasks. The paper suggests that a true results-based approach should reward the achievement of actual results, above the costs of their delivery, comparable to the profit margin of producing a market product. Yet practical solutions demonstrating how this principle can be implemented are still lacking. Herzon et al. (2018) conclude that although results-based approaches have specific challenges at every stage of design and implementation, there are at least 11 advantages to the results-based approach that are not found in management-based schemes.

Incentive design

Bryan (2013) analysed the interactions between incentives, land use change and ecosystem service provision. Change in land use and management can affect multiple ecosystem services, with both co-benefits and trade-offs. Multiple changes in land management and multiple incentives often interact with both synergies and tensions in their effect upon ecosystem services. However, incentives commonly only address a single ecosystem service, despite the fact that environmental interventions often have unanticipated consequences (positive and/or negative) beyond their primary objective (Bryan, 2013: 128). Changes in the supply of ecosystem services may also have a dynamic feedback effect on incentive prices, depending on scheme design (Bryan, 2013: 125). Those designed with elastic prices that respond to changes in supply and demand should be most cost-effective and result in the optimal supply of an ecosystem service. Understanding these effects can lead to substantial gains in the efficiency of policy and management, and avoid negative outcomes of various kinds. In

⁶ Examples include the Burren Programme in Ireland and the Dartmoor Farming Futures Project (Arnott et al 2018).

addition, policies should be implemented synergistically, to prevent policy instruments pulling against each other.

Bryan (2013) notes that in order for the value of ecosystem services to be reflected in markets, the environmental good must be rival (its use precludes use by others) and excludable (access to it can be restricted to those who pay). While some market goods such as crops and livestock are rival and excludable, public goods such as biodiversity are non-rival and non-excludable. This presents a particular challenge when valuing such goods, and markets must be created specifically for them. Until this routinely happens, farmers will not prioritise their production. As a corrective, schemes managing the supply of public goods and ecosystem services can implement market-based incentives. One example of a market-based valuation of AES payments comes from the UK's Exmoor Management Agreements. First concluded in 1979, the compensation payments varied annually, depending on commodity market prices (Franks, 2019: 149). Another example comes from the Welsh government's commodification of environmental goods; an innovative approach designed to counteract market failures (Arnott et al., 2019). To be effective, market-based incentives need to be supported by a carefully designed regulatory framework (e.g. quantifiable units of service provision, clearly defined property rights, monitoring requirements and contractual arrangements) (Bryan, 2013: 125).

In addition, bundling payments for multiple ecosystem services may result in more efficient outcomes, particularly when they relate to services for which markets are more difficult to create. For example, public goods such as biodiversity may be bundled with more easily marketed services such as carbon or recreational activities (Bryan, 2013: 128). Whilst this may create price premiums for sellers, it may increase transaction costs for those responsible for monitoring service provision. Land managers may be able to take advantage of multiple markets for ecosystem services by credit stacking: selling ecosystem service co-benefits generated through a single change in land use into multiple ecosystem service markets. Bryan (2013: 128) notes, however, that incentive interactions are much more complex than this and the costs associated with ecosystem service trade-offs are often unconsidered in credit stacking arrangements.

Cooke and Corbo-Perkins (2018) also studied how landholders may co-opt or resist the rationalities of market-based instruments (MBIs) in private land conservation. Through interviews and property walks with landholders in Victoria, Australia, the authors examined the implementation of a reverse-auction tender scheme, 'EcoTender'. They uncovered tensions between the market logic of the program and landholders' conservation practice, including that landholders were producing ecosystem benefits that challenged those required by EcoTender, and that many landholders wanted collaboration with neighbouring properties while the scheme required individual competition for cost efficiency. This makes cross-boundary conservation efforts particularly difficult to achieve under an auction-style program. Collective bidding processes may be more appropriate in such cases (Cooke and Corbo-Perkins, 2018: 179).

Cooke and Corbo-Perkins (2018) identify a particular tension between the way PLC positions private property as the foundation around which policy is conceived, yet frequently fails to have mechanisms that accommodate management challenges occurring at a landscape-scale. The article stresses that careful reflection is required when market logic is applied to conservation practice: whilst it may appear to promote creativity and innovation, competition between land managers may be undesirable in such a context (Cooke and Corbo-Perkins, 2018: 173). In contrast to the EcoTender model, Cooke and Corbo-Perkins (2018: 179) note the strengths of the Landcare program in Australia, which centres on social learning benefits as derived from collective, community-based responses to land management challenges rather than individual, property-centric responses.

Collaboration, co-operation and co-ordination

Several papers reviewed here explored collaboration, co-operation or co-ordination between land managers working to deliver environmental outputs. Of these, four were based on empirical material from the Netherlands. An examination of collaborative agreements is especially important considering that Landscape Recovery will likely require multi-party agreements to be formed in order to deliver the kind of boundary-spanning landscape-scale benefits that the scheme is aiming for. Some of the papers in this subset also considered the role that advisors or facilitators can play in the development and implementation of often-complex, multi-party agreements. It should be noted that the boundary between co-ordination and collaboration may be 'fuzzy', meaning these approaches may be best conceptualised along a spectrum (Franks, 2019: 148). While the former requires land managers to work towards the same objective, they do so in isolation, often under the guidance of a third party. In contrast, the latter type of scheme requires land managers to work together through a maintained dialogue.

There is no single solution when encouraging collaboration as the requirements vary depending on the environmental issues being tackled alongside the land owners' circumstances and motivations (Wheeler et al., 2021). However, Westerink et al. (2017) note that carefully designed AES can actually create landscape-scale impacts by default, reducing or eliminating the need for either farmer-farmer collaboration or third-party coordination of efforts. As an example, they point to how limiting the number of management options in a particular area can create a focus on certain options; by default, this may create a joined-up approach across farm boundaries. Wheeler et al. (2021) also point out that whilst collaboration is not a strict pre-requisite to delivering environmental benefits at a landscape scale, with coordinated and auction-based approaches requiring little to no farmer-farmer interaction, there are several benefits to collaborative approaches, including social and personal benefits, the creation of supportive spaces, opportunities for mutual learning, and advice provision. Effective facilitation is, however, vital if these benefits are to be achieved (Wheeler et al., 2021).

Boundary-spanning organisations

DEFRA's 2011 White Paper on the Environment announced several initiatives for developing collaborative approaches towards landscape-scale environmental management (Franks, 2016). In particular, the goal to establish 12 nature improvement areas across land from 10,000-50,000 hectares, could provide a model for how collaborative approaches to Landscape Recovery may work. In a process of competitive tendering, applications to establish these areas were encouraged from partnerships of local authorities, local communities and landowners, the private sector and conservation organisations. In addition, cross-farm, boundary-spanning organisations such as local nature partnerships (LNP) were recommended by the white paper, and are designed to create interconnected ecological networks (Franks, 2016: 50).

LNP should take a strategic overview of environmental requirements in their area, and create a joined-up approach to managing the land, so that the natural environment is managed as a system rather than individual parcels (Franks, 2016: 60). In order to achieve this, they have been given a wide degree of flexibility in deciding what their priorities should be, and how best to achieve these in their local area (Franks, 2016: 60). However, Franks (2016: 61) states that LNP take a strategic rather than hands-on role. To provide guidance on collaborative management at the landscape scale, organisations should be more involved in information sharing and constructing management plans; boundary-spanning organisations can fill this gap (Franks, 2016).

Boundary-spanning organisations may take many forms, and understanding the key organisational and structural elements of successful cross-boundary organisations may help direct future policies for

encouraging cooperation and collaboration at a landscape-scale. Using boundary organisation theory as the basis for analysis, Franks (2016) profiles the structure, organisation and working practices that make certain organisations especially successful at negotiating resolutions to complex problems involving multiple stakeholders with divergent interests. Boundary organisations must be able to gather the different values and perspectives of all interested parties in order to facilitate the flow of information between stakeholders. When a problem is identified, boundary organisations reformulate it to reflect the values and views presented by all sides. This initial process helps define the problem more clearly, enabling purposeful action to be taken. Franks (2016) states that successful boundary organisations provide a forum which:

- Encourages truthful exchanges
- Incentivises stakeholder participation
- Fosters autonomous decision making
- Results in collaboration and social learning
- Maintains accountability by all participants

Franks (2016) examines three UK NGOs (Linking Environment and Farming, Game and Wildlife Conservation Trust, and Farming and Wildlife Advisory Group) in the context of boundary organisation theory, to determine their suitability as facilitating organisations in the negotiation of landscape scale conservation agreements. At the time of Franks' research, each of these organisations was occupying a discrete niche on the boundaries between farmers, government agencies, conservation biologists and consumers of food and the countryside. Their positioning, and their track record of leading and assisting with environment projects, leads Franks to conclude that each of these NGOs has the skills needed to coordinate collaboration between various stakeholders and take a bottom-up participatory approach to addressing local needs and issues. Crucially, Franks (2016: 66) notes that many projects overseen by these NGOs appear to have a self-sustaining structure that continues to provide a bridging forum after official funding has ended. The paper suggests that organisations such as these may be key to devising practical solutions to the problems that may be associated with forming landscape-scale, long-term agreements for environmental management. Such organisations seem to lower the cost of collaboration and enable social learning. Most of these models involve facilitators coordinating groups of land managers and facilitating dialogue with other stakeholders, authorities and networks (Prager et al., 2012).

Dedeurwaerdere et al. (2015) examined the role of network bridging organisations in compensation payments for agri-environmental services under the EU's Common Agricultural Policy. From data gathered from 34 field interviews and a quantitative survey in the Walloon Region of Belgium, the study found that farmers who have greater levels of contact with network bridging organisations show a higher commitment to land management change. Fostering co-operation and social learning amongst diverse actors, such organisations have been shown to enhance the effectiveness of AES and thus increase scheme cost effectiveness. Since it is unlikely that a single organisation can produce the broad range of knowledge needed for scheme success, a number of organisations can, at various times, fulfil the role of a bridging organisation. In such instances, they may be able to provide a complementarity of knowledge that would otherwise be lacking. In addition, non-profit and autonomous research bodies are in a better position to inspire trust and facilitate social learning among farmers, compared to private sector actors who would be paid for such knowledge and service. Building trust and fostering new social norms for land management in this way should make changes in agri-environmental perspective and management more sustainable in the long-term (Dedeurwaerdere et al., 2015: 26).

Collaborative agreements

Providing an agglomeration bonus may be one way of incentivising collaboration across holdings (Franks and Emery, 2013; Westerink et al., 2017). Although built into the scheme design, this would, in part, allow farmers to organise themselves, representing more of a ‘bottom-up’ approach to spatial coordination. A real-world example of this comes from the Prime-Vert program in Quebec, Canada, where farmers are rewarded for collaborating their environmental land management across farm boundaries (Zaga-Mendez et al., 2020: 303). Examples of collaboration include joint initiatives to protect riparian zones, prevent soil erosion or encourage biodiversity. A collaborative approach to landscape-scale environmental management is incentivised by a 20% increase in the payment farmers receive under this scheme. In order to be eligible for this collaborative bonus, farmers must jointly submit a request to regional authorities to be approved as a collective agri-environmental initiative.

Franks and McGloin (2007a) describe two Dutch AES innovations that encourage landscape-scale environmental management: joint scheme submissions by neighbouring farmers, and the co-ordination of AES by clubs of neighbouring farmers known as Environmental Co-operatives (EC). Based on interviews and surveys with farmer and non-farmer members, policy makers and other stakeholders, the paper shows the role that EC can play in overcoming some problems inherent in AES. The paper then analyses UK agri-environment policy using Actor Network Theory⁷, to compare and contrast the similarities and differences in the agricultural climates of the Netherlands and the UK. In particular, Franks and McGloin (2007a) recommend that the UK government place a higher level of trust in, and demonstrate a greater commitment to, the farming community; without these, co-operatives such as those operating in the Netherlands are judged to be unfeasible in the UK context.

Introduced to the Dutch Management Programme in 2000, the opportunity to submit a joint application to an environmental scheme offers an additional instrument for connecting areas of land within a spatial pattern that better underpins ecosystem functioning, resists fragmentation and enhances habitat and species resilience (Franks and McGloin, 2007a: 234). This innovation helps address the scale mismatch that occurs between the spatial aspects of the environment on the one hand, and land ownership and management on the other. Referred to elsewhere as ‘economies of configuration’ (Gottfried et al., 1996 cited in Franks and McGloin, 2007b: 472), this mismatch often prevents an optimal environmental plan from being put in place.

Underpinning joint scheme applications in the Netherlands are the existence of Environmental Co-operatives. Established in 1992 as local organisations of farmers (and often including non-farmers⁸), their origins lie in the struggle of Dutch farmers to be recognised as environmental managers (Franks and McGloin, 2007: 243). Key to their expansion was the willingness of the Dutch Ministry of Agriculture to support their organisation, for example by making start-up grants available and putting farmers at the centre of the policy making process (Franks and McGloin, 2007b: 486). EC work in close collaboration with each other and with local, regional and national agencies to integrate nature management into agricultural practice. Over the last 30 years, these farmer groups have become

⁷ Actor Network Theory is a widely used theoretical framework for analysing environmental and agricultural policy, because it captures the range of actors involved in scheme implementation, as well as the wider social and cultural frameworks within which AES agreement holders operate (Franks and McGloin, 2007a: 249-250).

⁸ Important to note is that some EC’s exclude non-farmers during their start-up phase, to allow farmers to develop the EC’s agenda and portfolio of activities; membership is then opened more widely. This may help prevent conflicts before the group is established. Additionally, EC with non-farmer members are more akin to UK social enterprises (a business with primarily social objectives whose surpluses are reinvested into the community; there is no single legal model for social enterprises) while those with only farmer members tend to be more profit-driven (Franks and McGloin, 2007b: 482-486).

institutionalised within Dutch agri-environmental governance, and are now an integral part of the Dutch Rural Development Plan (Westerink et al., 2017: 182). Besides co-ordinating the submission of joint applications, EC also help with matters such as managing scheme payments and monitoring progress towards the achievement of environmental outputs. Franks and McGloin stress that EC's involvement in these three aspects of AES ultimately raises the quality of environmental output from schemes (2007a: 234).

The Subsidy Organisational Support (ROS) scheme in the Netherlands includes a specific option for payments to be made directly to the EC that is helping to administer a particular contract, rather than to the land managers carrying out the environmental management work (Franks and McGloin, 2007a). This option is designed to help support the EC in their role negotiating and running contracts. Likewise, some submissions choose this option in order that financial matters are placed with the EC: it allows the EC to receive and redistribute payments between participating members, rather than place this responsibility with individual farmers. Crucially, some EC also play a role in making financial provision in case the contracted outputs are not met. For example, the treasurer may withhold a proportion of the annual payment in order to cover any end-of-scheme penalties (Franks and McGloin, 2007a: 239). As the penalty for falling short of contracted outputs is up to 30%, this can help mitigate the financial impact felt by farmers who fail to meet their targets. This also has an important link with overcoming the problem of what happens when one member of a joint contract fails to uphold their contracted outputs. Some EC have an internal reallocation system for this eventuality, in which participating farmers pool a proportion of their payments and the EC reallocates them according to rules agreed by the farmers, with those with the most environmental output received the largest proportion of the pooled payments. This is a question for each EC however, and depends on agreement between the EC and all participating members. Indeed, Franks and McGloin (2007a: 242) note that because of the complexity of such matters, some EC avoid becoming involved in financial arrangements related to under-achievement in contracts. In such cases, each individual member is fully accountable for payments and penalties that may be imposed, and the EC holds no liability for these matters. Land managers therefore remain individually and directly responsible for their piece of land, but they gain benefits of co-operation in the EC alongside this autonomy.

The main factors that Franks and McGloin identify as particular barriers to the adoption of similar measures in UK AES are the relative lack of joint submission options to date, and the independence of farmers when it comes to implementing and managing AES. Precedence had been set for encouraging agri-environment submissions between neighbouring land managers by allowing joint submissions from commoners sharing grazing rights on common land, yet the introduction of the HR8 option within the Higher Level of the Environmental Stewardship Scheme (ESS) in January 2005 represented the first explicit encouragement of joint submissions (Franks and McGloin, 2007a: 244). A particular problem for enrolling common land into AES was that Natural England required all stakeholders to agree to participate in the agreement; HR8 was designed, inter alia, to encourage participation among common land stakeholders (Westerink et al., 2017: 181). HR8 paid £10/ha for joint submissions that covered areas under more than one ownership, to be managed for resource protection, inter-tidal flood management and wetland management. The payment was designed to be compensation for the increased transaction costs of joint application. To be eligible, farmers required boundary-spanning environmental features and had to agree to jointly manage these.

Prior to HR8, agreements covering common land had to be negotiated by a single representative, nominated by all who held a legal interest in the land. Thus, payments were made to an individual, but that payment was ultimately shared by the group (Westerink et al., 2017: 181). For HR8 payments, each farmer group had to adopt an official name and open a bank account into which the entire HLS

and HR8 payment was made; this organisation is ultimately responsible for the collective agreement (Franks, 2016: 55). They also had to submit an internal agreement, signed by all relevant stakeholders. These agreements varied, but had to include full details of the location of management activities, each parties' contribution to the scheme, and details on how payments would be shared out between the group members (Westerink et al., 2017: 181). HR8 did not specify how payments should be distributed among the stakeholders, but most agreements pool all the environmental payments, using these to cover administrative costs associated with the agreement first, and then distributing it for management of land costs, and lastly to agreement holders based on the options they selected (Franks and Emery, 2013: 856). It should be noted that the distribution of payments generally becomes more complex and agreement-specific as the number and range of stakeholders increases. These complexities may help explain why in the first 6 years of HR8's existence, only 123 of approximately 6,000 HLS agreements included this option (Franks, 2016). Rather than a true collaborative agreement, the UK's HR8 agreements represent a hybrid form of contract, where an internal agreement between farmers is made beneath an overarching agreement between this farmer group and the governmental authority.

The lack of collaborative scheme options in the UK exists despite research that suggests UK farmers would consider participating in collaborative conservation management plans, subject to adequate compensation payments (see Dolman et al., 2001, cited in Franks and McGloin, 2007a). Yet farmers in the UK have not historically had much experience of cooperative working for environmental outcomes (Davies et al., 2004; Mills et al., 2006) despite the clear benefits, including sharing and minimising costs alongside resilience and capacity building. Yet Franks and McGloin (2007: 243) believe that farmers do not tend to have an incentive to collaborate given that they remain the principal agents for AES implementation on their land. The need for greater financial reward for farmers who act co-operatively was a key recommendation in Lawton et al.'s (2010) report, but it raises important questions about how such incentive payments should be designed (Franks, 2016: 50).

Putting in place schemes that cross land ownership barriers would require farmers to be no longer dealt with as individual units (Franks and McGloin, 2007a: 246). The instrument currently used in the UK context to deliver some connectivity at the landscape scale is co-ordination between farmers, overseen by an external regulator, as opposed to co-operation between them⁹. Franks and McGloin (2007a) note that direct farmer-to-farmer co-operation has been discouraged in the past by DEFRA Project Officers, who have preferred to amend individual applications to incorporate environmental improvements on contiguous parcels of land, rather than deal with joint submissions. This is a model that has been used in the UK's Countryside Stewardship Scheme (CSS). Yet their use of Actor Network Theory (ANT) allows Franks and McGloin to challenge this model: in particular, they note that ANT asserts that an 'originator' is required to enrol other actors into a programme in order to realise its goals (2007a: 250). EC as 'originators' have proved highly successful in enrolling farmers into Dutch AES, in part because of their trusted advice and in part by advocating farmers' roles as 'partners' in such schemes (Franks and McGloin, 2007a: 250).

In the Netherlands, EC are a useful bridge between policy makers and farmers, being an identifiable and trusted group both for farmers to join and for institutions to access (Franks and McGloin, 2007b: 478). Moreover, their role as a single point of contact for the dissemination of information is vital, ensuring ongoing engagement with the scheme from above and below. A similar example of collaborative groups is given by Westerink et al., (2017), who note that Environmental and Economic

⁹ Co-ordinated approaches to AES are typically characterised by a top-down approach to scheme management, as opposed to a co-operative (bottom-up) approach (Zaga-Mendez et al., 2020: 298).

Interest Groups (GIEE) in France have been proven to enhance collective action among farmers, and to promote better environmentally-focused practice.

In Belgium, farmer groups have, since 2000, been experimenting with collective agri-environmental management (Westerink et al., 2017). For example, a regional landscape organisation in West-Flanders recruited a group of farmers to address landscape-scale environmental issues. This group were legally organised as a non-profit organisation, and later, a special purpose co-operative company with limited liability was founded. This allowed farmer members to offer their services and be paid for their land management actions.

Similarly, the ECO² (ECOlogy x ECOonomy) project, founded in 2008 in rural Flanders, facilitates agri-environmental collaboration between farmers and other local actors in order to stimulate a landscape-scale approach (Westerink et al., 2017). ECO² focuses on small, fairly informal groups of farmers (usually between 4 and 11 members), so that a strong feeling of group connection is created. These groups do not have any legal form, but they adopt statutes and bylaws, and are run by a management board that is elected every 5 years. Payment for their environmental management activities is channelled through a non-profit umbrella organisation (an agro-management centre known as Eco²), which also plays a role in redistributing payments between farmers. This organisation is also the body with which other parties contract to arrange land management; management work is then outsourced to the farmers' groups. For this coordinating role, Eco² receives part of the payment. Crucially, at the time of Westerink et al.'s (2017) paper, the administrative details allowing AES payments to be made to groups of farmers had not been settled by the Belgian government, so all payments had to be paid to individual farmers. Eco² therefore plays an intermediary role between the government and its farmer members, allowing for the de facto payment of groups.

Barriers to collaboration

Based on a telephone survey of farmers participating in the HR8 option of the UK's HLS scheme, Franks' (2016) study reports the problems encountered by farmers with this collaborative management option. In addition, the paper surveyed farmers not participating in a collaborative agreement, to determine the perceived barriers to collective, multi-farm environmental agreements. Since at the time of the study no concrete models of collaborative working had been provided by DEFRA or Natural England, Franks (2016) chose not to define what 'working together in collaboration' might mean. Interestingly, very few participants asked for further details on this, and most appeared to rely on their own notions of what form and practice collaboration might entail. Franks reports that 89% expected problems to occur, and that these perceived problems were very similar to those actually encountered by participants in HR8. However, most of these problems were overcome with the assistance of independent organisations working in a bridging capacity between farmers, and between farmers and government agencies. Remarkably, in their study of Dutch multi-party AES, Franks and McGloin (2007a: 242) state that none of the interviewees raised concerns about conducting financial transactions with their friends and neighbours, leading them to conclude that this was not a barrier to participation in an Environmental Co-operative.

The three most commonly reported problems in HR8 collaboration were (Franks 2016: 54):

- Ensuring individual responsibility (and therefore individual liability) for land management
- Dividing scheme payments between participants
- Financing the upfront costs of an agreement (for example legal fees for drawing up formal contracts)

Franks (2016) also identified two groups of land managers who had attempted, but failed, to secure participation in HR8. Failed agreements of this kind can provide potentially valuable information on differences and difficulties that were not able to be overcome. One case foundered over the land in question's primary use (whether it should be for shooting, farming or conservation), and the other failed because the landlord demanded too high a share of the total environmental payment. Of the lowland agreements studied by Franks (2016), three out of four had combined several sites under a single collaborative agreement that was managed by a local conservation grazing trust. The trust had a track record of experience with collaborative agreements, and it took the full environmental payment as its fee in exchange for taking full legal responsibility for managing the land; this removed the burden of responsibility for managing the land to the required environmental standard from the landowners.

Importantly, six of the HR8 agreements surveyed by Franks (2016) had followed from collaborative agreements arranged under previous AES. These agreement holders reported fewer problems than those who were working in a newly-formed group, as many issues had already been addressed and overcome. This points to the importance of using existing networks to form cross-boundary agreements, as prior experience of working together can establish good levels of trust and social capital, helping to ensure scheme success and the satisfaction of all parties involved.

Of the twelve new agreements studied, seven required help from an external agency or intermediary organisation, to overcome start-up and negotiation problems such as these (Franks 2016: 55). Key contributions of these intermediaries included bringing farmers together and facilitating meetings, offering advice and arranging access to legal expertise. Most commonly, the intermediary on these occasions was a project officer from Natural England. Franks (2016) reports that this is because Natural England is incentivised to intervene by a public sector agreement committing it to improve the environmental management of SSSI areas, many of which are to be found in the upland areas covered by HR8 agreements. While many organisations could step in to fill the bridging role required, Franks (2016: 61) states that it may be necessary for organisations to be issued government licences, to ensure the help given is of a trusted and high-quality nature. In particular, such organisations must be inclusive and have a robust governance structure (Franks 2016: 67).

Collaborative governance arrangements

In co-governance models such as the environmental forum in Germany, non-state actors are consulted by centralised bodies, but have no direct impact on scheme implementation. In contrast, collaborative governance¹⁰ models establish a horizontal form of cooperation between actors and the state, which directly influence the implementation of environmental policies. Westerink et al. (2017) analysed collaborative governance arrangements of AES in five EU member states in North West Europe (France, Belgium, England, Germany and the Netherlands). In particular, their paper focuses on the various approaches to agri-environmental management across farm holdings that are found in these countries. They note that while many scientific articles advocate collaborative governance to deliver landscape-scale environmental benefits, very few papers address real-world examples of spatial coordination and collaboration among farmers. Paying particular attention to the distribution of governance tasks among collaborating actors and changes to these over time, the paper finds that the complexities of a landscape-scale approach to environmental management necessitate the spatial

¹⁰ Westerink et al. (2017) use the following definition of collaborative governance: 'the processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished'.

coordination to be overseen by a professional organisation (a governmental organisation) or a professionalised organisation (such as a group of farmers).

Governance arrangements for AES may take many forms, as actor networks, policies and institutional frameworks vary between countries and regions. Moreover, differences in environmental priorities and socio-cultural factors influence the way that individual schemes develop. This means that 'cutting and pasting' (Westerink et al., 2017: 177) schemes from one state or region to another is unlikely to be successful. This paper, however, aims to generate transferable lessons from the case studies reviewed. Importantly, Westerink et al (2017) distinguish between collaborative governance and collaborative management, with the latter referring to the collaboration among those who are actually involved in carrying out management activities on the land. In both cases, tasks can be distributed among actors in varying network constellations. Such a division of labour helps makes collaboration attractive, at both governance and management levels. Exactly how these tasks are divided in practice is an issue that must be resolved by each collaborative network in turn.

Collaborative governance networks can be defined through three distinguishing features:

- A high level of regulation through informal institutions (in addition to formal institutions)
- A high degree of participation of a broad set of stakeholders in the governance process
- The recourse to interactive problem solving amongst a decentralised network of collective actors (Dedeurwaerdere et al., 2015: 27)

Dedeurwaerdere et al (2015) give the example of a successful PES system in Ontario, Canada, which reaches over 20,000 farms. This scheme has been jointly administered between the government, a coalition of 30 farm organisations and an association for soil and crop improvement that is made up of farmer experts. Here, the local branches of the Soil and Crop Improvement Association provide for social learning by supporting farmers with the creation of environmental action plans, providing advice through workshops and following-up on management implementation. The government's role is purposefully limited to an advisory and funding role, with control of the scheme being shared throughout the collaborative governance network.

Collaborative governance networks have proven to be especially important in situations of heterogeneity among the actors concerned. In particular, including a broad set of stakeholders in the governance of an environmental scheme gives members access to different kinds of knowledge which may be vital for finding innovative solutions to problems, leading to a higher degree of adaptiveness and thus robustness within a scheme. Collaborative networks may therefore be an important complement to conventional regulatory forms of environmental governance, providing a horizontal or bottom-up approach that can accommodate the social learning needs of the multiple stakeholders operating in agri-environmental schemes. While such governance networks can suffer from high implementation costs, the key message from literature is that a more diversified governance system, which has recourse to a combination of government, market and collaborative networks, will have a higher adaptive capacity for tackling complex environmental management problems (Dedeurwaerdere et al., 2015: 27).

The 'more joined' approach suggested by Lawton et al. (2010) necessitates, at the very least, co-ordination between land managers, and Arnott et al. (2019) believe this must begin with government. However, when social and/or economic outcomes are to be achieved, collaborative agreements are more able to provide these than mere co-ordination alone (Franks, 2019: 154). Franks (2019) notes that a 2013 DEFRA study found as many as 45% of farm businesses were working with others to deliver

environmental benefits. Of these, over half were doing so through passive, co-ordinated, third party activities as opposed to active, collaborative and farmer-to-farmer actions.

Mills et al.'s (2008) evaluation of the drivers of successful co-operation within AES in Wales, makes five key recommendations as to how greater success can be achieved:

1. Developing a group AES to enable collective action
2. Longer-term AES' once groups have legal status
3. Working with existing groups is best, or newly formed groups where members are familiar; new groups can take a decade of continued activity to foster the levels of trust needed to result in formal cooperation
4. Group sizes should be relatively small to enable monitoring
5. Co-operative, group agreements should form collectives whereby they self-police and set their own sanctions

As noted above, Farmer Groups formed for CSS may provide important learnings for the kind of collaborative working required for Landscape Recovery.

Between 2012-2014, the Dutch government experimented with new types of collaborative agri-environmental management, using pilot studies to develop and trial new collective schemes (Westerink et al., 2017: 182). One of these pilots, with the environmental association Water, Land en Dijken (WLD), found that the administrative procedures for the collective AES, and the need to develop tailor-made regional plans, was overly time consuming. Indeed, Bond et al. (2018: 417) note that whatever form a group of landholders may take, it is likely that they will require a longer time period for decision making than an individual. They recommend that this extra time allowance should be built into incentive program design. In multi-actor AES, advisory services are especially important given the increased complexity of these schemes (Mack, Ritzel and Jan 2020: 5).

However, farmers taking part in collective AES did accept WLD being responsible for control and sanctioning. Westerink et al. (2017) note that several factors contributed to this acceptance:

- Comprehensive communication between WLD and farmers
- Cohesiveness of the land managers working towards the same goal
- Strict protocols for monitoring
- Use of graduated sanctions for non-compliance
- Trust farmers have in WLD's field coordinators.

In order to overcome the initial administrative issues, the Dutch Rural Development Plan recognised WLD and other similar associations as formal farmer groups. So from 2016 onwards, WLD have been responsible for compiling their own collective management plan for their area, recruiting farmers and spatially coordinating them within this plan, and controlling the delivery of agreed management options. WLD also receive the AES payments from the government, which are redistributed by them to individual farmers. Central to the most recent iteration of the Dutch plan is that farmer group applications are now only granted in areas where cross-holding environmental management is in place. Thus, farmers can only receive agri-environmental payments if they are a member of a formal farmer group, and participation in AES is restricted to those farmers who farm in areas that have been pre-designated by the government as benefitting from landscape-scale environmental measures. This approach is, in part, designed to reduce both public and individual farmer costs associated with AES administration, as these are now handled by the farmer groups. Not only has this reduced transaction costs for the Dutch government, which now manages 40 agreements (between Environmental Associations and itself) rather than 15,000 (between individual farmers and itself), it also has another

benefit: because the contracts between the Environmental Associations and its members remain within private law, there is room for individual fine-tuning of measures and payments (Franks 2019: 157).

As the Netherlands' and UK's agricultural landscapes share similar structural characteristics – notably with a dense population and farms being much smaller than the size required for landscape-scale environmental schemes¹¹ – Franks and McGloin (2007a: 247) suggest that there may be a place for similar organisations to EC in the UK. Indeed, a 2005 DEFRA study concluded that 'self-help' networks are especially effective in delivering sustainable farm practices (DEFRA 2005b, cited in Franks and McGloin, 2007a: 247). Factors identified as increasing this effectiveness include:

- Greater farmer engagement
- Local knowledge is incorporated within schemes
- Flexibility of the schemes
- Improved knowledge transfer between policy authorities and land managers
- Feeling of collective responsibility for the delivery of environmental benefits

Yet this DEFRA study also indicated that the central establishment and management of farmer groups is likely to be unaffordable for DEFRA (DEFRA 2005b: 5, cited in Franks and McGloin, 2007a: 248), meaning such groups would need to find financial and personnel support from elsewhere. Franks and McGloin (2007a: 248) emphasise that whilst some seed funding would be required, DEFRA need not have any involvement in the ongoing management of such groups; indeed, the Dutch government has no management role in EC. This lack of central bureaucratic involvement is what has allowed EC to follow different development trajectories, and has therefore made them more representative of local members' interests and requirements. EC have also been identified as key in influencing and changing farmers' attitudes to environmental management; in particular, they are viewed as trusted sources of information (Franks and McGloin, 2007a: 239). The guidance, advice and facilitation roles required for collaborative governance may also be provided by any combination of NGOs, government agencies, independent consultants, or professionals (Westerink et al., 2017).

The collective governance arrangements outlined in this section vary widely with regard to the actors involved, their role in the process of scheme design and implementation, and the governance tasks they carry out (Westerink et al., 2017). However, they represent examples of collaborative governance which include an element of spatial coordination of management activities; thus they represent a landscape-scale approach to AES. Westerink et al. (2017) note that the increasing complexity of governance required for landscape-scale AES necessitates both increased collaboration between farmers, and the professionalisation of farmer groups. Further studies are needed in this area to provide a more comprehensive picture of how to incentivise group involvement, and how to structure environmental agreements to better suit group tenders.

Multi-stakeholder engagement

Capano et al. (2019) emphasise the need to effectively engage stakeholders in the design stages of environmental policies and agreements. Without adequate engagement of the various stakeholders who may be involved or impacted by it, an agreement will likely fail to deliver the anticipated or desired environmental benefits. Stakeholder engagement is also identified as being especially valuable for the co-production of knowledge that helps ensure scheme success. The authors note, however, that literature on capacity building, education and awareness among stakeholders is currently lacking

¹¹ 18 ha and 86 ha respectively (Franks and McGloin 2007a: 247); compare to DEFRA's stated aim to implement Landscape Recovery over areas of land from 500 – 5000 ha.

(Capano et al., 2019: 195). Their paper recommends actively and comprehensively engaging different stakeholders in co-design approaches, and co-production of knowledge. This, Capano et al. (2019: 197) believe, could lead to:

- More innovative schemes
- Increased understanding of complex socio-ecological systems
- The formulation of more legitimate and actionable policy proposals

Enloe et al. (2017) examined how diverse public, private and non-profit organisations have worked in partnership to engage farmers in water quality management efforts in the Boone River Watershed (BRW), Iowa, US. Using a resilience framework, the authors demonstrate how multi-stakeholder collaboration has enabled many of the traditional barriers to watershed programming to be overcome. Notable amongst these barriers are problems relating to a lack of public funding, both in quantity and duration, and complexities surrounding mixed-ownership landscapes with complex land-use dynamics. From the literature on resilience, the authors note that adaptive co-management emerges as an innovative approach to managing complex socio-ecological systems such as watersheds. This is a marriage between adaptive management and co-management (governance involving heterogeneous actors), and can provide a useful way of coping with uncertainty in large-scale schemes.

In the BRW scheme, program leaders secure private funding to provide farmers with the opportunity to trial a management practice without having to sign a contract or personally invest in practices that may not provide them with a return. This is especially important for tenant farmers, who may not see a financial return on their investment within the period of their rental contract (Enloe et al., 2017: 582). However, research indicates that social capital, land tenure and knowledge about scheme impacts are equally as important to long-term farmer engagement as financial reward (Enloe et al., 2017: 583). Additionally, BRW partners augment public funding with private sources to engage agronomists as outreach partners to help build social capital within the farming community. Crucially, the monitoring system has been co-constructed by stakeholders, resulting in an evaluative framework that all parties feel is fair. Yet the paper notes that monitoring scheme success by biophysical measures alone may not be enough: instituting a social monitoring program in concert with this is critical to the future continuation of good practice.

However, the scale mismatches caused by external socio-economic and ecological forces still present substantial obstacles to the programme's resilience. In particular, there is a scale mismatch between the geographic boundaries of the BRW and the jurisdictional boundaries of the agencies involved in the programme. In some part, these have been overcome by bridging organisations, who have helped stakeholders reimagine and manage the landscape in accordance with non-arbitrary geographic lines (Enloe et al., 2017: 584). In conclusion, the multi-stakeholder collaboration and complementarity of funding sources has enabled partners to create a more comprehensive watershed-based management approach than would have been possible without cross-sector involvement.

Summary

AES – especially those that exhibit collaborative elements – have important learnings for the design of multi-party, long-term, landscape-scale agreements. Some of the key factors identified in this section relate to the steps required for a successful approach to collaborative schemes and their design. These include:

- Identifying all potential stakeholders
- Raising awareness of environmental issues among land managers
- Understanding the extent to which land managers are able and willing to collaborate with others to manage ecosystem services at landscape scale
- Increasing communication between land managers, government agencies and other stakeholders; bridging organisations may serve this purpose
- Minimising risks associated with participation by using trials of new approaches or management practices
- Approaching different land-owning communities differently (e.g. tenant farmers, absentee and group landlords)
- Identifying formal institutional barriers to collaborative working

Prager et al. (2012) note that AES design often bypasses local expertise, increasing state-local tensions and preventing optimal policy design and implementation. Crucially, front-loading participation within programme design has been shown to build trust and co-operation, leading to more durable decisions and actions (Prager et al., 2012: 246).

Blended finance

Introduction

Blended finance can be defined as ‘a structuring mechanism that strategically uses public and/or philanthropic capital to catalyze additional private capital and increase private investment’ (Choi and In, 2021: 4). As such, it is hybrid in nature, operating between public and private spheres, and aiming to achieve a transformative impact in the local sector it targets. However, there are some key areas of ambiguity surrounding blended finance, derived from (Choi and In, 2021):

- The multitude of actors, forms of financing and objectives involved
- Complex governance structures
- A lack of transparency surrounding monitoring and evaluation
- A lack of understanding of the implications and value for money of public capital investment in blended finance agreements
- The local context and dynamics involved in blended finance operations

In addition, the public goods provided by environmental projects are often regional in nature, with non-excludable benefits (i.e. benefits that are distributed among a range of stakeholders) (Bisaro and Hinkel, 2018). Both of these factors may be a disincentive to investment, thus representing another ambiguity surrounding blended finance.

Many of the papers in this section deal with broad environmental challenges, especially those related to the energy sector and climate change adaptation, as to date, these areas have received the most private and blended finance investment (Choi and Seiger, 2020). How public interventions – through policies and finance – can help direct private finance towards green investments has become a key question in debates surrounding climate change and sustainability. Focus has turned from corporate social responsibility, which attempts to reduce the negative impacts of firms’ economic activity – to ‘impact investing’. Impact investing actively tries to generate net positive social and environmental impacts alongside a financial return (Pascal et al., 2019: 2). Structuring investment deals with a mixed portfolio of public and private funds has been a common practice for major development banks in recent years, and the European Union has been creating structured mechanisms and blending platforms since 2007 (Choi and Seiger, 2020).

Blended finance has increasingly gained traction within development policy as a way to fill a series of financing gaps related to the Sustainable Development Goals, but recently, attention has turned to blended finance's potential for creating biodiversity and conservation markets (Christiansen, 2021). In the UK, blended finance models have been adopted in relation to afforestation and peatland restoration, through the Woodland Carbon Code and the Peatland Code (Moxey et al., 2021). In both cases, government policy seeks to achieve ambitious targets by leveraging private investment to stretch limited public funds. The UK government has also had success with a Climate Public Private Partnership (CP3), launched in 2012 to increase low-carbon climate resilient investments in developing countries. The size of early commitments by the UK government as an anchor investor for CP3 provided credibility with private investors and facilitated initial uptake of this scheme (Choi and Seiger, 2020: 22). Blended finance is, therefore, essentially a reframing of development finance policies that seek to unite different actors in order to mobilise private capital by minimising risks and/or increasing returns for investors (Christiansen, 2021: 96).

To date, blended finance research has focused on the sources and recipients of investments, rather than on the composition, conditions and decision-making processes governing blended finance vehicles (Choi and Seiger, 2020). Well-functioning blended finance vehicles achieve impact while delivering risk-adjusted financial returns for investors, but Choi and Seiger (2020: 9) emphasise that the use of public capital should be temporary, since the ultimate goal of blended finance is to facilitate sector development, market building, and a regular flow of private investment that sustains itself. According to this research, blended finance should, therefore, be used only where projects cannot be funded on a fully commercial basis, and when institutional or market failures prevent private sector involvement. Moreover, public authorities should avoid overcompensating private investors in reducing risks and enhancing returns (de Nevers, 2011).

The ambiguities of blended finance mean that there is a lack of systematic guidance on effective approaches and strategies for its implementation (Choi and In, 2021). In particular, when designing and implementing blended finance mechanisms, attention should be paid to the country and sectoral context, including its markets and market failures. Moreover, to encourage private investment, governments should articulate how blended finance is supporting the creation of markets and helping them move toward commercial sustainability (Choi and In, 2021)¹². This will make investing in blended finance projects more attractive, by lowering perceived risks and increasing the likelihood of better returns on investment (ROI). In addition, state interventions can help normalise the practice of blended finance and increase social acceptance of private investment in the environment; again, this should increase the attractiveness of investment. Importantly, these recommendations are not just specific to blended finance situations, but should also be applied more broadly to the development of landscape-scale approaches to environmental management.

¹² Tabaichount et al. (2019) note that most schemes touted as promoting market-based instruments in fact adopt economic incentives to affect behaviour without creating a true market structure.

The literature reviewed here identifies several key factors that motivate private investment in blended finance projects:

- **Increased financial viability of projects** (Adhikari and Chalkasra, 2021).
 - Public investors can improve an investment's risk-return profile by lowering perceived and real risks associated with investment in environmental projects (Choi and In, 2021).
 - If possible, a demonstrable track-record of positive financial returns should be made available to investors (Pories et al., 2019); this is not usually possible for environmental projects, which may be small-scale, newly-begun and take a long-term approach to returns.
 - Concessional and grant funding should be used at the seed stage to 'crowd-in' private investment (Christiansen, 2021).
- **Increased information to help guide decision making** (Adhikari and Chalkasra, 2021).
 - At a governmental level, having reliable, integrated information regarding the current status of financial flows across sustainability projects helps inform clearly articulated national strategies to address funding gaps and allocate limited resources in the most efficient way possible (Clark et al., 2018).
 - Capacity building should be undertaken between stakeholders (Apampa et al., 2021), with the aim of building consensus between public and private investors (Choi and In, 2021). This will strengthen the business case of a project (Pories et al., 2019).
- **A sector that is structurally conducive to private investment**
 - Increased transparency and accountability can increase willingness to invest (Meissner and Winter, 2019: 316-7). Strong monitoring and evaluation frameworks are key here, along with performance-related incentives and penalties (Pories et al., 2019).
 - Better institutional environments (Fleta-Asín and Muñoz, 2021), perhaps with designated government bodies to oversee blended finance activities. This reduces fragmentation and helps direct finance to projects more efficiently (Choi and In, 2021).
 - Business models that enable private investment at scale (Adhikari and Chalkasra, 2021). This may include tax incentives and prioritisation of access to financial benefits, risk underwriting and technical assistance (Christiansen, 2021).

Private sector and blended finance investments: some case studies

Financing climate change adaptation

Adhikari and Chalkasra (2021) analysed case studies relating to the mobilisation of private sector investment in climate adaptation. As the climate finance flow is far below the level needed to meet the target in the Paris Agreement, there is growing interest in how private finance can be mobilised. Notably, it appears that there is no concrete typology defining private sector investment and contribution, and it can be very broad. Currently, the private sector's involvement in climate finance continues to be more inclined to mitigation rather than adaptation: 93% of total climate finance in 2017-18 was targeted at mitigation (Adhikari and Chalkasra, 2021: 2). This, the authors believe, is because mitigation-related investment offers measurable climate benefits and greater financial returns to investors compared to adaptation. Similarly, adaptation benefits are seen to be largely public rather than private, and may be very localised in nature. This paper also demonstrates that the private sector is willing to invest in climate adaptation, but its investment decisions are constrained

by the risk profiles associated with climate adaptation projects, the lack of financially viable projects, and a lack of knowledge to guide decision making.

Risks to investors may come from the regulatory environment (e.g. from policy changes) or markets; businesses will not invest if there is no assurance of investment return. While prevailing markets continue to offer the prospect of better returns, investors will continue to allocate their capital to maximise ROI, regardless of environmental impacts (Clark et al., 2018). Polzin et al.'s (2019) review of 96 empirical studies of renewable energy (RE) investment determines that risk and return are the most important factors impacting investment decisions: only if both metrics correspond to investors' expectations will they engage in projects.

A lack of a coherent national framework and policy environment for mainstreaming climate change adaptation can also deter the private sector from investing in this area, since this serves as a guiding force for the private sector to calculate the probability of risk in investment. Giving the market sufficient access to information is crucial, and national governments must play a leading role in providing and distributing knowledge. Additionally, building capacity for investment through participatory engagement in scheme design may help attract private investment (Adhikari and Chalkasra, 2021: 10).

Adhikari and Chalkasra (2021) stress that national governments, as market regulators, must identify business models that enable private investment at scale. Suggested models include tax incentives and prioritisation of access to financial benefits. Moreover, appropriate policies and incentives should be designed that link private sector strategies to the desired climate-resilient outcomes; strong monitoring and evaluation frameworks are of crucial importance here. Indeed, Clark et al. (2018) note that investors prefer concrete, measurable outcomes rather than intangible ones. Identifying Key Performance Indicators (KPIs) with stakeholder input, and using these alongside standard metrics of success, can capture a wide range of socio-economic and environmental impacts (Pascal et al., 2021: 8). The marketing of projects is also key to encouraging investment, since projects must be pitched in a way that is attractive to investors (Adhikari and Chalkasra, 2021: 11).

Some investment projects – especially those related to the delivery of public goods – may be less suitable for the private sector, because the benefit of these takes a longer time to materialise and there is a degree of uncertainty about the value of that benefit, especially on a short-term revenue basis (Adhikari and Chalkasra, 2021: 4). This emphasises the importance of public sector incentives to enable the private sector to maximise their return on investment in a predictable manner. Clark et al. (2018) note that many businesses operate according to a model of 'short-termism', which prefers the maximisation of profits in the short-term, as well as the holding of liquid assets. Thus, business models are often in direct conflict with the long-term investment decision making that is required for sustainability-related projects.

Additionally, variations in business size, sector, human resources and structure will impact the scope of investment opportunity. Thus, a tailored approach – to different private sector actors and different types of projects – is necessary to leverage private sector finance. This will likely require a variety of financial mechanisms, and must be supported by conducive public policy interventions to mobilise private investment more widely. Blending finance can help address many of these barriers, but there is also a role for combined finance (bundling different types of finance within a single project), to make otherwise unattractive projects attractive to investors (Adhikari and Chalkasra, 2021: 14).

Financing sustainable agriculture

Apampa et al.'s (2021) paper reflects many of the findings of Adhikari and Chalkasra (2021), discussed above. Analysing blended finance for sustainable food systems, Apampa et al. (2021) find that investment is heavily constrained by: a high perception of risk; poor information provision; a mismatch between the investment needs of those implementing projects and those funding them; and high transaction costs. Analysing the current challenges and opportunities associated with blended finance, the authors propose that it could be a way to remedy these deficiencies.

The agricultural sector is traditionally considered as one of the riskiest sectors for financial investment, which has led to an insufficient allocation of capital. The paper asserts that this finance gap will only increase, considering the additional capital required for the transition to more sustainable practices. Whilst the importance of increasing investment in sustainable development is often underlined, the agricultural sector continues to experience very low levels of investment. Accessing finance for a transition to sustainable practices is even more challenging given the unproven business case for conservation investment (Apampa et al., 2021: 4). Blended finance can help de-risk some of the challenges to private sector investment, but it requires a multi-stakeholder partnership approach to be successful. In particular, these partnerships need to foster dialogue and gain a better understanding of each other's positions. Capacity building is key to mobilising larger investments into sustainability projects, and should be accompanied by catalytic or concessional development funds to encourage investment (Apampa et al., 2021: 9).

Apampa et al. (2021: 5) assert that blending public funding with private sector resources is the best solution to finance sustainable investment at scale. Scaling-up blended finance mechanisms should catalyse private sector investment on the one hand, and incentivise producers on the other hand. However, the authors believe this scaling-up requires a simplification and standardisation of transactions. Otherwise, transactional costs will be prohibitive, especially when a large group of stakeholders is involved (Apampa et al 2021: 6). Whilst this reflects much of the material on AES transaction costs, it should also be compared to the large body of work discussed here that stresses a tailored rather than standardised model – for AES and for financing – provides the best outcomes in terms of scheme uptake, participant satisfaction and environmental outputs. However, it is important to note that bespoke and small-scale investment vehicles tend to increase risks for investors (Apampa et al., 2021: 9).

Apampa et al. (2021: 6) identify three stages within the potential transformation to greater blended finance investment in sustainable agriculture. These are summarised in Figure 3 (below). This pathway to large-scale investment has been achieved in the renewable energy sector, where a limited set of structure archetypes have been replicated and adapted to achieve large scale investment. Blended finance solutions need to address a number of risk challenges, but when done successfully, projects will become bankable, securing a greater supply of investment. In summary, blended finance approaches must improve the risk-return investment profile to levels accepted by all actors involved, in order to create a market-equivalent investment opportunity.

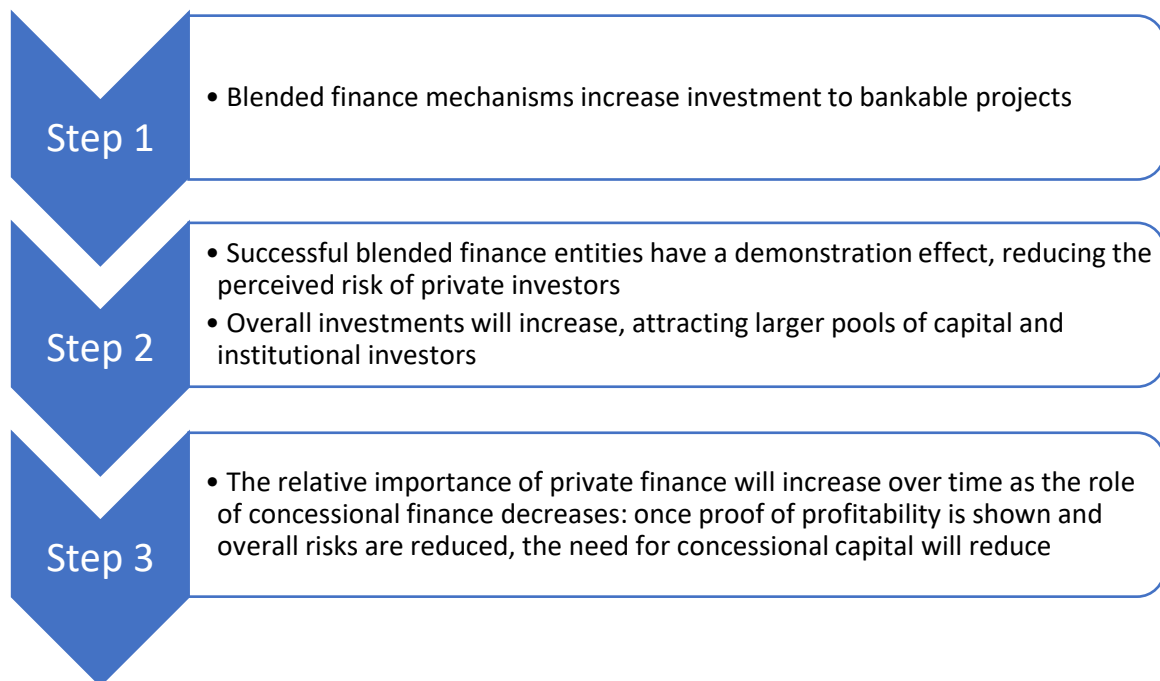


Figure 3: The pathway to large-scale blended finance investment (Apampa et al., 2021: 6)

Clapp (2017) examines the rise of initiatives for responsible agricultural investment, and assesses the likelihood of their success in curbing the socio-ecological costs associated with the growth in private financial investment in the agricultural sector since the mid-2000s. She argues that, in their current form, responsible agricultural investment governance efforts are unlikely to bring substantial changes in practice. In particular, she identifies several weaknesses of agricultural investment initiatives (see Table 4, below); many of these reflect the findings of other papers in this report, and potential solutions can therefore be found in the wider literature.

Weaknesses identified by Clapp (2017):	Potential solutions, derived from the literature discussed in this report¹³:
Vague and difficult to enforce guidelines	Develop strong structures to oversee investment. Implement robust monitoring and evaluation frameworks.
Low participation rates	Reduce risk and uncertainty for private investors using public funds as a catalyst for investment and to increase the ROI of private investments. Provide adequate information to investors.
An uneven business case	Ensure the impact of investments on the ground can be seen. Incentivise participation through tax relief and loans.
Confusion from multiple and competing initiatives	Ensure the additionality of different schemes. Provide adequate information to investors.
A large diversity of investors	Implement collaborative approaches to managing and funding projects, to ensure all stakeholders' goals are in alignment.
High degree of complexity of investments	Provide adequate information to investors.
Mismatch between short- and long-term horizons of investors and sustainability	Develop stable markets for public goods, thereby reducing uncertainty. Normalise private investment in sustainability projects.

Table 4: Weaknesses of agricultural investment solutions and potential solutions to overcome these.

Financing sustainable landscapes

Rode et al. (2019) examine the potential of blended finance investment for sustainable landscapes, using the case study of the Unlocking Forest Finance (UFF) project. Between 2013 and 2018, UFF worked on the development of innovative financing mechanisms for sustainable landscapes in three sub-national Amazon regions of Brazil and Peru. UFF involved the collaborative work of multiple stakeholders, including local governments, academic partners and land managers. The involvement of local partners ensured that project outcomes were aligned with jurisdictional objectives, while other partners had specific technical mandates. UFF's focus on regional jurisdictions proved more manageable than a national approach, while still being large enough to provide landscape scale interventions. However, the financial viability of most of the transition activities was challenging, due to long repayment or high transaction costs, as well as the complex governance required to implement transition at scale.

Discussions with potential investors revealed that investors were put off by the pre-determined portfolio of investment opportunities; rather, they wanted to select the activities of interest to them. Moreover, although cash-flow and risk analyses remained the main tool for determining the viability

¹³ Most of these need to come from government, whether at national or local level; some may also be addressed by a bottom-up approach.

of investments, investors were also concerned by the format of these. They were unlikely to trust the cash-flow analysis without demonstration of a track-record of successful implementation and payments; yet sustainable agriculture projects are often small-scale and without track-record (Rode et al., 2019: 7). And while the non-financial return of the ecosystem benefits was attractive to governments, the link for investors between ecosystem valuations and investment proposals was weak. Thus, UFF decided to include recognised on-farm environmental standards to aid monitoring and provide a trustworthy verification of environmental returns for investors.

Ultimately however, UFF could not identify private sector funding sources that would accept a rate of return below those of traditional investments. The large majority of impact investors demand environmental and social returns as co-benefits, without compromising financial returns. However, the supply side of sustainable investment opportunities cannot easily meet these conditions. Projects often involve high financial risk and are not necessarily replicable across regions, due to landscape variations. The UFF approach to unlock private financing for a comprehensive transition has not materialised. A sector-based approach with investments into specific profitable pro-environmental activities may work, but is less prone to deliver landscape-scale benefits. In conclusion, the paper cautions that the conservation community should be careful not to overestimate the role that private sector investment may play in conservation projects. Large-scale investments will only happen when investment models have been tested; until then, government support via blended finance will continue to be required, to cover non-reimbursable elements at least (Rode et al., 2019: 7).

Encouraging private investment

Public-private partnerships

Bisaro and Hinkel (2018) undertook a literature review of papers relating to private finance for coastal adaptation. They note that this is an under-researched area, and research is especially lacking surrounding what promotes private investment and how can public actors' interest be aligned with those of private investor interests. The authors find that sole private provisioning attracts investment when returns are high, for example in real estate, but that public-private partnerships (PPP) are promising in situations with high operational costs. Like Apampa et al. (2021), Bisaro and Hinkel (2018) note that concessional loans, along with tax incentives, may help enhance private investment, especially where there is uncertainty regarding the regulatory and legislative environment.

One barrier to private investment in coastal adaptation arises from the political economy of coastal adaptation (Bisaro and Hinkel, 2018: 2). Rewards for investment are scarce, yet revenue streams are essential for attracting private investors. Institutional investors with long-term liabilities – for example pension funds and insurers – are more likely to have investment horizons that match the long-term horizons of coastal adaptation projects. However, Clapp (2017) notes that the business case for environmentally sustainable financial investment, even among institutional investors such as pension funds, is weak at best. Alternatively, in long-term projects, returns to investors can be provided through long-term contracts with the government; these returns depend upon the government's ability to honour such contracts over their lifetime and/or at the end of the contract. The distribution of liabilities may be another barrier to private investment; liability risks increase when project outcomes are uncertain. However, limiting the liability of private investors can create a moral hazard for governments (Bisaro and Hinkel, 2018: 4).

In order to overcome such barriers, new forms of cooperation between public and private actors are needed. Bisaro and Hinkel (2018) analyse the role of PPPs in mobilising private finance for adaptation, stressing that little scholarly attention has thus far been paid to the mechanisms by which alignment in public and private interests may be achieved. In the PPP provisioning mode, a public actor grants a

long-term contract to a special purpose vehicle (SPV), a legal entity established solely for the purpose and duration of the project in question. The SPV is the provider of the work required, and may be exclusively privately owned or might include public shareholders. Typically, the public actor will make annual payments (annuities) over the lifetime of the contract, while the SPV finances the upfront costs (Bisaro and Hinkel, 2018). PPPs may be compared with other approaches to public-private provisioning (Pascal et al., 2021: 3):

Mode of provisioning	Characteristics
Public-private partnerships	SPV is responsible for the project management
Co-management	Management responsibilities are shared between government and one or more actors
Co-operation	A partner assists government with specific aspects of management – often related to technical matters – without formal decision-making authority.

Table 5: Modes of public-private provisioning

The public actor’s choice of provisioning mode is driven by the need to limit their own financing costs, whilst still achieving their policy objectives. Provisioning modes with greater private sector involvement entail giving up some degree of control in regard to the latter, which may ultimately raise public costs from designing, monitoring and enforcing contracts. In particular, trust and inclusiveness are identified as key to making PPPs a success (Bisaro and Hinkel, 2018). This reflects the findings from research on other forms of environmental co-operatives discussed in this report. Research also indicates that smaller PPPs, where the private partner takes a larger share of responsibility, show a greater degree of private investment participation (Fleta-Asín and Muñoz, 2021).

However, Bisaro and Hinkel (2018) note that it is difficult to make clear-cut distinctions between categories of finance provision, as real-world examples often blend different provisioning modes. Further, these are only top-level categories, and there may be many differentiations of lower-level governance arrangements, including differing ownership, operational and payment arrangements. Nonetheless, they identify some general classes of financial instruments used in coastal adaptation (see Table 3). In addition, financial instruments may be classified according to whether they are project finance or balance sheet finance instruments. Project finance is limited to the financing of a project through a SPV; balance sheet finance refers to instruments in which the investor has full recourse to the assets and revenues of the investee (Bisaro and Hinkel 2018).

Class of financial instrument	Characteristics
Direct and indirect equity, shares or stocks	The investor provides money to the investee, and gains claims on future revenue streams and a degree of decision-making or voting power in return
Direct of indirect debt, loans or bonds	The investor provides money to the investee, to be repaid in full by the end of the contract, plus periodic payments of interest.

Table 6: Classes of financial instruments used in funding for coastal adaptation projects

Other financial instruments to promote private sector investment

Polzin et al.'s (2019) review of literature on private finance investment in renewable energy projects finds 14 types of financial instruments used in such projects. These can be used to build on Bisaro and Hinkel's (2018) classification, and indicate which instruments appear to have the most promise for encouraging private investment:

- **Feed-in tariffs (FITs)** are the most widely implemented policy instrument in RE projects globally, being used by more than 80 countries in 2016; these have been associated with an increase in RE investment and deployment. FITs reduce price risk for investors by guaranteeing a stable return over a specified period; this caters well to investors' need for predictable returns.
- **Tax credits** are used by approximately 40 countries, but are associated with policy uncertainty, since these directly depend on government budgets and changing fiscal decision-making.
- **Grants** have been shown to have the greatest effect on increasing the return of a RE project by reducing upfront costs; they are used by over 100 countries worldwide.
- **Guarantees** can reduce risk for investors and thus encourage investment, but excessive loan guarantees for investors can increase funding for low-quality projects, which may ultimately result in a loss of investor confidence.
- **Trading schemes** are prominent among the market-based instruments (MBIs) identified by Polzin et al. (2019), yet the link between them and RE deployment remains weak.
- **Regulatory instruments** such as **quotas** are also extensively used, and are generally associated with larger and more cost-effective projects, owned by established companies and based on mature technologies; in the UK, quotas are used extensively for onshore wind funding.

Crucially, Polzin et al. (2019) identify non-fiscal instruments such as **information** and **education** as having an indirect but important influence on private investment in RE. In particular, this can increase social acceptability of projects and associated investments, which can in turn aid the sustainability of investment levels in the long run.

Redefining the role of government in environmental investment

Market creation from above

Tabaichount et al. (2019) analyse state interventions in environmental markets in Canada and New Zealand. Using the example of water quality trading (WQT) schemes, the paper explores the gap between the theory and practice of hybridised environmental governance and finance interventions. While WQT is promoted as a way to secure private funds into agri-environmental practice, WQT schemes remain strongly dependent on institutional support from public agencies. What emerges is a hybridised institutional form that blends market-based techniques with top-down hierarchical structures. The paper argues that WQT enables the state to retain its influence on the way watershed management takes place, whilst channelling new funding sources and targeting a broader range of actors to achieve its wider environmental and socio-economic objectives. These new institutional arrangements reframe traditional modes of environmental management and affect the way public and private resources are distributed among actors. In sum, hybrid forms of financing and governance are shown to be a response to the high transaction costs and complex socio-economic contexts faced by WQT. Indeed, the paper identifies a reduction in transaction costs as being a principal factor driving hybridisation between regulatory tools and market dynamics in the management of ecosystem services.

WQT schemes are market-oriented mechanisms in which participants can voluntarily exchange their water pollution rights with respect to certain criteria related to water quality improvement. They provide new sources of revenue to farmers through direct payments for nutrient credit offsets. Despite their market base, the state remains an important actor, responsible for setting emissions limits and providing the regulatory context in which these programmes operate. The high cost of commodifying ecosystem services excludes the possibility of solely depending on market governance. Similarly, the common-pool properties of many ecosystem services – especially those related to watersheds – make it difficult to implement new forms of regulation, since no single actor is responsible for environmental outcomes. In the WQT schemes studied by Tabaichount et al. (2019), public authorities play a major role at every stage of the programme, and their support is essential to the implementation and functioning of the trading schemes. They provide an official status and legal framework to the programmes, as well as financial, material, technical and symbolic resources. The public authorities remain the initiators of the schemes as well as the ultimate legal authority responsible for water quality management.

The two schemes studied by Tabaichount et al. (2019) differ in terms of how they use price signals for the WQT market. In the South Nation programme in Ontario, Canada, the price per kilogram of phosphorus that regulates transactions is determined not by supply and demand but by the public authority; decision-making is centralised and price is a tool to frame stakeholders' behaviour. In contrast, in the Lake Taupo scheme, New Zealand, the price is affected by the supply and demand, therefore it reflects the effects of diverse ecological and social factors on the provision of emissions credits. Hybridisation in these schemes has crystallised around the transfer of financial resources, where the state not only creates the conditions for involving private stakeholders, but also harnesses the economic mechanisms to support specific projects. This hybridisation is a concrete response to the gap between theory and practice in WQT, but further research is required to assess the effectiveness and efficiency of institutional hybridisation for assuring water quality standards (Tabaichount et al., 2019: 7).

Market creation from below

Christiansen (2021) examines blended finance in the context of the Blue Economy. Building on qualitative research on efforts to create markets for private investment in marine conservation, the paper analyses how an ensemble of non- and semi-state actors seek to fill the financing gap in this area. The paper contributes to the literature on for-profit biodiversity conservation by highlighting how efforts have been made to create new markets for this; by using blended finance, this represents a creation of markets ‘from below’.

Drawing on theories of risk and uncertainty, Christiansen shows how blended capital approaches can promote markets by strategically taking on uncertainty. Rather than the state being engaged in re-regulation of environmental governance in favour of markets, the state’s role becomes redefined in terms of its capacity to ‘de-risk’ investment. This has proven difficult to date in the conservation sphere, as investors lack ‘calculative devices’ against which they can measure how investible opportunities are. Christiansen (2021) stresses that in order to understand economic decision-making, we must understand how imaginaries concerning the future shape decisions in the present. Because actors are acting towards an unknown future under conditions of uncertainty, they need to have calculable risk models to inform their actions. Like Adhikari and Chalkasra (2021), Christiansen (2021) notes the importance of providing adequate information to investors, to encourage investment on the one hand, and fix ‘fictional expectations’ on the other.

In particular, Christiansen (2021: 94) identifies three issues surrounding the ‘value’ of nature:

- It is generally illiquid (it cannot be easily converted into cash in a short amount of time)
- Value has multiple meanings, not just that defined by the capitalist mode of production.
- Value in conservation may be best measured by considering the labour invested in its production.

In addition, biodiversity investments are uncertain in the sense that there is no guarantee they will be able to deliver transformative proofs of concept, which would spur future investments. Similarly, Clark et al. (2018) note that the public goods derived from ecosystem services are treated as externalities of market production – i.e. as a consequence of commercial activity – and are therefore not reflected in traditional markets. It therefore becomes difficult to quantify the underlying financial benefits of conservation. While the pricing of public goods is a political matter, the process of tariff-setting should be as transparent and consistent as possible, and must ensure that tariffs are correlated to costs and their increase over time (Pories et al., 2019: 7). Clark et al. (2018) recommend that collaboration among multiple actors can improve the understanding of the underlying benefits of conservation that may otherwise take time to be realised, or that are intangible and difficult to measure.

Collaborative management in blended finance arrangements

Collaboration is the focus of Pascal et al.’s (2021) paper on impact investment in Marine Protected Areas (MPAs). MPAs are promising examples of Nature-Based Solutions that can protect biodiversity while delivering ecosystem services. However, insufficient funding of MPAs remains a challenge. A large body of evidence from marine and terrestrial protected areas shows that, when collaborative management is viable and appropriate, it can redistribute the financial burden on states whilst attracting the long-term economic and technical support needed for effective management. Using the case study of an MPA in the Dominican Republic – the Arrecifes del Sureste – Pascal et al. (2021) show how a collaborative management approach, alongside a blended finance model, has successfully addressed the funding gap in this instance.

The design of the collaborative management agreement for the Arrecifes del Sureste encompasses several key elements that are reflected in other literature surveyed in this report, both in relation to blended finance and AES more widely. These are:

- **Engaging local actors** – this has been key to the project’s success, driving the social and environmental process forward.
- **A clear business model** – the challenges and opportunities to produce revenues have been clearly identified and quantified.
- **Investibility** – the MPA demonstrates an adequate risk-return ratio.
- **Impact** – the ecological and socio-economic impacts of the project are clearly measurable through KPIs.

In the Arrecifes del Sureste, the government maintains the core functions of the MPA and is responsible for regulation, enforcement and maintenance. A non-profit Special Purpose Entity (SPE) was established to manage day-to-day operations; this is comprised of conservation NGOs and other local associations. A set of KPIs¹⁴ and result metrics have been developed with and for impact investors, and specific reporting arrangements have been set up to ensure the SPE is complying with these. Initial data provides baseline indicators and annual audits are carried out by the SPE to assess the KPIs; external audits are carried out every two years by independent authorities. In addition, a Stakeholders Advisory Committee (SAC) facilitates the participation of all stakeholders in the management of the MPA.

Identifying revenue streams to repay investors is one of the primary limiting factors to attracting up-front investment. In MPAs, the options for generating ‘tangible’ revenues in the short- to medium-term are mostly limited to revenues related to tourism. Other revenues – such as carbon credits, biodiversity offsets and PES – have a longer incubation term and limited track record, and are still considered as conceptual by impact investors (Pascal et al., 2021: 3). Proof-of-concept is considered a key prerequisite to building confidence and thus scaling-up investments in the natural capital impact investment market globally (Pascal et al., 2021: 6).

Addressing externalities

Moxey et al. (2021) examine the barriers and opportunities facing the practical implementation of a blended finance approach, using the UK Peatland Code as a case-study. While restoration of degraded peatlands can provide environmental gains in a socially cost-effective manner, the paper notes that many benefits are public goods arising as externalities; thus, they are difficult to convert into financial returns for private investors. To address this problem, the Peatland Code has been developed as a voluntary certification standard for UK peatland projects wishing to seek additional private funding via the voluntary carbon market. Private investors are attracted primarily by the market value of carbon credits, while public funding is justified in terms of the wider co-benefits that are yet to be captured by market mechanisms (e.g. biodiversity, recreation and landscape enhancement).

Uptake of the Peatland Code has been slow. Moxey et al (2021) observe six main barriers to supply-side uptake, and demonstrates the role that blended finance may play in encouraging scheme uptake (see Table 7, below). Thus, the paper takes the opposite approach to others in this chapter, showing

¹⁴ KPIs for conservation projects may encompass a combination of environmental, economic and social indicators of sustainability (Khatri-Chhetri et al., 2021). Environmental metrics are the most commonly used and understood of these, but economic indicators of sustainability – including changes in production and income streams – may offer the strongest motivation for participation to farmers. KPIs for governments may include aspects of social welfare that are difficult to account for; in such cases, quantifying ROI becomes especially problematic (Goldstein et al., 2008).

not how private investment can be encouraged, but how private investment can motivate land managers to participate in an environmental scheme. The barriers to adoption among land managers reflect many of those for AES in general, identified earlier in this report.

Barriers to Peatland Code uptake among land managers:	Recommendations to overcome barriers:
Lack of scheme awareness	Increased effort to promote sustainable land management
Resistance to land use change, especially when it may reduce agricultural production	Guarantees surrounding eligibility for agricultural support payments and tax reliefs
High upfront capital costs	Public funding of upfront capital investments Blended financing of costs: voluntary carbon market prices alone cannot generate sufficient revenue to fully displace grant aid
Limited equipment and skills	Capacity needs to be built, possibly through subsidised advice and training
Uncertainty over ongoing costs and support	Private investment directed at ongoing payments
Administrative bureaucracy and inflexibility	Simplified and flexible administrative arrangements

Table 7: Barriers to the UK Peatland Code scheme uptake among land managers, and potential solutions. Derived from Moxey et al. (2021).

Moxey et al. (2021) recommend that public and private schemes should be designed in tandem, to improve their practical complementarity but with care taken to ensure the additionality of each. This recommendation comes as the authors believe in the short- to medium-term, private financing will not be sufficient to fully substitute public funding. However, the schemes should demonstrate ongoing interactions, being adaptable enough to encompass the possibility of increased private funding in the longer run. Thus, purposeful, joint planning is required (Moxey et al., 2021: 3).

Domestic foundations to encourage private investment

Choi and In (2021) examine state-led decarbonisation in the Republic of Korea, assessing how the government strategizes and deploys its capital to mobilise private investment for climate impact. The paper focuses on the design of incentives and institutions to catalyse private investment. In Korea, green investment products were launched by government agencies under its Green New Deal of 2009. These took the form of state-controlled funds which used public finances to guarantee the principle and offer returns higher than the market rate. Whilst the top-down approach facilitated rapid disbursement of public funds, partnerships with private investors were limited to one-off projects and thus lacked scalability.

The Korean government therefore introduced new institutional developments in its New Deal Fund, announced in September 2020 (Choi and In, 2021). Consisting of three tiers, the Fund now serves as the main financing mechanism to invest in green industries. Notably, the Policy Fund tier of this is a blended finance vehicle that uses catalytic capital from the government to attract private investment. The Fund consists of 35% public contributions and 65% private investment. The rationale behind this Fund is that investing in green industries involves a high level of uncertainty and a long investment horizon, making it difficult for private capital and investment to come in without public investment being involved to lower the risk. In addition, contributions from the public sector take a subordinate position to private investment, so they absorb losses first, lessening the risks to private investors. The investment-return structure also offers private investors priority on reflows, allowing them to get repaid first in the case of excess revenue. Private investors are offered the choice of purchasing a portion of public contributions during the investment period, and for projects with a high investment risk, the Policy Fund can increase the public proportion of funding to 45%, thereby increasing the buffer for private investors.

Another significant institutional development is the proposal for a Green Finance Corporation, as a state-run financial institution to manage the Green New Deal. Designating a co-ordinating agency for blended finance activities is aimed at reducing fragmentation in the sector, and promoting the efficient allocation of capital. This marks the beginning of a proper legal and institutional framework to facilitate durable deployment of blended finance in Korea (Choi and In 2021: 18).

Crucially though, for blended finance to be successfully applied, consensus must be built between public and private investors. The investment community must receive a strong signal from government about green finance in order to properly embrace the concept and opportunities. This requires a strong domestic foundation, in order to ensure blended finance is institutionalised and internalised, to sustain its activities and performance (Choi and In, 2021: 13). Explicitly incorporating green finance into the national agenda – including with collaborative policy development – can support government activities, especially at the intersection between public and private investments. In Korea, green measures are viewed through the lens of economic growth and national interest, and policymakers perceive ‘growing’ and ‘greening’ the economy as complementary goals that can be advanced by developing and commercialising green opportunities.

Governance of blended finance arrangements

Choi and Seiger (2020) carried out a literature review of blended finance vehicles for decarbonisation in developing countries. They state that it is crucial to have a clear picture of the internal governance configuration of blended finance vehicles in order to determine their scalability and transformative impact on climate finance. Only then can public and private actors effectively determine how to mobilise, structure and co-ordinate flows of finance towards sustainable development pathways at scale.

Blended finance has grown rapidly since 2009, and Choi and Seiger (2020) observe a shift from a model of direct investment to a layered mechanism with lengthened value chains. This proliferation of intermediaries in blended finance vehicles makes questions of governance paramount. Specifically, there must be a clear understanding of the parties involved, the terms under which they blend their capital, and the decision-making processes they undertake. Blended finance inherently necessitates that stakeholders with different mandates and interests collaborate, potentially creating underlying tensions and trade-offs in investment decisions. To mitigate some tensions, strong monitoring and evaluation frameworks should be put in place; this will increase the transparency of blended finance accounting. Choi and Seiger (2020: 30) conclude by emphasising the need to position blended finance within the project lifecycle, starting from its origination.

Summary

The evidence demonstrates that as a relatively new field of practice, there are many ambiguities that remain surrounding blended finance.

Whilst there is a clear case for using public finance to catalyse private investment, there are few concrete examples of how this has been successfully achieved in environmental projects; most successful examples come from climate change mitigation and renewable energy, which are larger, more developed sectors with strong technological areas that are attractive to investors. Indeed, the agricultural sector has traditionally been considered as one of the riskiest sectors for financial investment (Clapp, 2017), and conservation investment has an as yet unproven business case (Apampa et al., 2021: 4).

The literature shows that political and bureaucratic uncertainty are major barriers to private sector confidence (Adhikari and Chalkasra, 2021: 12-13), thus governments need to create a conducive regulatory environment that builds confidence. In practice, this means:

- creating a coherent national framework and policy environment
- being aware of the risks and barriers investors face
- creating investible opportunities and putting forward a strong business case for these

Using concessional funding can help de-risk some of the challenges to private sector investment, but to be successful, blended finance requires a multi-stakeholder partnership approach. In particular, these partnerships – like those required for successful agri-environment collaboration – need to foster dialogue and build capacity and trust amongst stakeholders.

Like the literature on AES, the financing evidence suggests that a tailored rather than standardised model provides the best outcomes in terms of scheme uptake, participant satisfaction and environmental outputs. However, it is important to note that bespoke and small-scale investment vehicles tend to increase risks for investors (Apampa et al., 2021: 9). As Landscape Recovery projects are specific to the local ecosystem areas they will take place in, projects will not necessarily be replicable across regions; again, this may increase financial risk and prevent successful schemes being used to create a demonstrable track record for investors to have confidence in.

One key issue is that the public goods provided by schemes such as Landscape Recovery do not often have clear ways of generating profit (Adhikari and Chalkasra, 2021: 9). In addition, these goods will often be localised in nature, with non-excludable benefits (Bisaro and Hinkel, 2018); both of these factors can disincentivise investment. Valuing the public goods arising from projects, and subsequently creating an appropriate market for them, may also prove difficult.

5. Summary of findings

Designing effective national environmental policies is challenging, as it requires interacting with complex, context dependent socio-ecological, institutional, legal and economic processes (Capano et al., 2019: 191). In particular, it is important to comprehensively examine the space in which an agreement will be implemented; this involves taking account of not just the geographical and environmental aspects of a scheme, but also the socio-cultural and economic backgrounds against which it will take place. Successful schemes and effective policy instruments are those that are closely matched to these wider factors.

This makes the transfer of evidence and recommendations from one context to another (especially from one country to another), difficult; caution should be used in such cases (Capano et al., 2019: 195). However, in the wealth of material surrounding long-term agreements for conservation and AES, there are many key areas from which learnings for effective policy improvement and implementation can be taken. The main points are summarised here:

Flexibility: The most successful agri-environmental policies appear to be those that contain a suite of different policy instruments, so they can accommodate different geographical and environmental contexts, alongside the various needs, values and capabilities of different stakeholders (Capano et al., 2019). In addition, flexibility of options may increase participation rates. It must be remembered that while participation in AES is voluntary, the methods of delivery of management options often force farmers to follow a standard rule (Arnott et al., 2019). The prescriptive nature of schemes can be a barrier to initial uptake, but can also be a barrier to knowledge production and to the development of adaptive management practices.

In addition, covenants appear to be attractive to a narrow subset of landholders (Comerford, 2013: 181). This should be instructive for policy makers, especially when designing landscape-scale or multi-party agreements: it suggests that one single type of agreement will not be suitable for the variety of landholders that are required to sign up in an area in order to make a landscape-scale scheme effective. Indeed, Lennox and Armsworth (2011) stress that a portfolio of short and long contracts offers greater conservation gains than using either type in isolation. However, they note that this strategy will likely result in higher implementation costs. Given the apparently limited appeal of conservation covenants, alternative schemes will likely need to be employed to increase the supply of environmental goods from private land, particularly from areas with high levels of agricultural production (Comerford, 2013: 181).

Financial incentives: Policy makers need to understand the likely implications of including a covenant in a conservation programme. Comerford's (2013) analysis of the VIP demonstrates that although programme designers widely supported the inclusion of covenants – as they were felt to offer greater value for money for the public funding of the programme, as well as ensuring long-term environmental benefits – covenant inclusion actually increased costs significantly, and decreased participation among landholders. Similarly, Lennox and Armsworth's (2011) research on the optimal length of conservation contracts found that conservation agencies must pay a premium to landowners to secure longer agreements. Thus, shorter contracts are advantageous if the land in question is likely to remain available for conservation in the future.

As much research demonstrates (see for example Moon and Cocklin, 2011; Comerford, 2013; Bond et al., 2018), the differences between production and non-production landholders have a far-reaching impact on their willingness and ability to participate in environmental programs. Understanding their varied requirements and tailoring policies to suit different types of landholding helps ensure programs have a wider reach and a greater level of success in delivering environmental benefits.

Advantages of collaboration: Management at a scale above the field or farm requires co-ordination between land managers at scales rarely operationalised or actively encouraged in the UK to date (Prager et al., 2012). This lies at the heart of the challenge for Landscape Recovery. Indeed, collaborative provision of ecosystem services has been hampered by a mismatch between the current scale of management and the scale of the ecological processes in question. Further, patterns of land ownership and tenure complicate administrative efforts and ecosystem boundaries, leading to increased transaction costs for coordinated landscape management. In addition, there is a temporal mismatch between the long-term view required to facilitate intergenerational equity (50-100 years), the timeframes typically used by land managers (up to 30 years), and those of politicians who may be elected for a 5-year term only (Prager et al., 2012).

Spatial co-ordination and collaboration can be arranged in various ways (Westerink et al., 2017). Arranging co-ordination via a governmental actor or by a third party working with individual farmers may be easier to organise than complex collaborative governance agreements. However, despite their complexity, collaborative schemes appear to offer many benefits for landscape-scale land management, to both the environment and participants. Crucially, the dynamic nature of collaborative governance arrangements must be taken into account when schemes are designed and agreements are formed (Westerink et al., 2017: 182).

While some costs of collaborative scheme establishment may be high in the early years, different approaches to payments may provide new opportunities for tackling over- and under-compensation of results. Suggestions include competitive bidding for outcomes rather than fixed-price payments, although this often requires a trade-off between the achievement of environmental outcomes and the administrative cost burden; thus, public agencies often seek a compromise solution (Herzon et al 2018: 351). A more diversified governance system, which has recourse to a combination of government, market and collaborative networks, will have a higher adaptive capacity for tackling complex environmental management problems (Dedeurwaerdere et al., 2015: 27).

Support and social capital: For long-term agreements, it appears especially important that scheme participants are given adequate support to effectively manage their areas of land according to their contracts. This helps ensure that agreements deliver the expected environmental benefits, whilst minimising the need for undesirable and costly legal interventions surrounding issues such as breach of contract. This support may take many forms, such as access to resources or knowledge, for example. It may also come from various sources, including peer-to-peer support, non-governmental or charity organisations, private enterprise, local authorities or national bodies. As demonstrated by some of the papers in this report (see for example Franks and McGloin, 2007a), utilising support networks from sources such as these can alleviate the monetary and time costs incurred by government. Support of all kinds has been identified as particularly important for land managers as they begin participation in a scheme (Groce and Cook, 2022: 7).

Westerink et al (2017: 177) point to the importance of social capital, both in the formation of groups and as a result of group working. Taking social capital to be the soft qualities of networks and relationships that enable groups to achieve results together, aspects such as trust, access to knowledge and support, shared values and the capacity to learn and innovate as a group are of particular importance. Westerink et al (2017) emphasise the role that governments could have in capacity building, to promote peer-to-peer support and learning, and ultimately raise the professionalisation of farmer groups in response to the changing landscape of AES.

Participatory scheme design and information sharing: Co-designing schemes with a variety of stakeholders should enhance the benefits of collaboration. In particular, it allows for a greater

consideration of: participants' agency and control over resources; their personal preferences and circumstances; the specificities of environmental programmes, especially at a local level (Zaga-Mendez et al., 2020). Tools to build capacity amongst stakeholders – including the provision of information, education and resources – should be built into program design. Further, this can have far-reaching benefits, helping to engage wider civil society in environmentally-oriented action too (Moon and Cocklin 2011: 502). The literature also demonstrates the need to keep schemes as simple as possible, whilst recognising the needs of all stakeholders and achieving the desired environmental outcomes (Herzon et al., 2018).

In particular, the co-production of relevant and usable knowledge has been identified as important to schemes' success (Capano et al., 2019). Again, this knowledge production and transfer may take a more horizontal (peer-to-peer) form, and is likely to be most relevant when grounded in specific local contexts. In addition, Moon and Cocklin (2011) stress the need for strong statutory and institutional collection, coordination and communication of environmental information at local, regional and national levels. In situations where access to information is limited, for both landholders and authorities, environmental programs tend to fall short of their intended outcomes. Ongoing monitoring should therefore be seen as an essential part of delivery, rather than as an 'optional add-on' (Wheeler et al., 2021).

In addition, environmental governance schemes that generate a societal transition may be particularly valuable to secure future environmental benefits and practices. In turn, these may reduce scheme costs at a later date, by encouraging the provision of environmental benefits as a routine area of management practice.

Blended finance: The evidence shows a strong case for using public finance to catalyse private investment, but many ambiguities remain about how this is done in practice. Government must create a regulatory environment that is conducive to encouraging private investment, to build investor confidence in the agri-environment sector. Using concessional financing can help de-risk some of the challenges to private sector investment, but blended financing requires a multi-stakeholder partnership approach to be successful. Issues of trust, capacity building and engagement are identified as being key to making public-private partnerships a success, just as they are in collaborative AES (Bisaro and Hinkel, 2018). Likewise, as in AES, a tailored model appears to provide the best outcomes in terms of scheme uptake and outputs, but it is important to note that bespoke and small-scale investment vehicles tend to increase risks for investors (Apampa et al., 2021: 9).

As the public goods provided by schemes such as Landscape Recovery will often be localised in nature, and with non-excludable benefits, it may be hard to effectively 'value' them, and subsequently create an appropriate market for them. Without both of these things, and a track record of projects producing good ROI, they will not be attractive to investors.

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Appendix: Evidence search and screening

Key words and search strings

The tables below detail the combinations of key words that were used in the final search strings for each research question, along with the number of results returned for each search, and the number of results imported to an EndNote library after initial screening was carried out (see the Methods section for detailed information about initial screening). Note there is overlap in research questions 2-4, thus results from RQ2 are also relevant to RQ3 and RQ4, and results from RQ3 are also relevant to RQ4.

RQ1: How to construct long-term agreements to safeguard investments in land use change and associated environmental outcomes?

Site	Search terms	No. of results returned	No. of results imported to EndNote
WoS	Conservation covenant	80	39
	“agri-environment scheme” OR “long-term agreement” AND (environmental OR agriculture)	291	14
	Farmer AND (environment OR conservation) AND (cooperation OR collaboration)	655	26
GS	“conservation covenant”	869	31
	“agri-environment scheme” AND environment AND agriculture	3,610	14
	“long-term agreement” AND environmental AND agriculture	2,030	5
	Farmer AND (cooperation OR collaboration) AND conservation AND environment	435,000	28

157 sources were imported to EndNote.

RQ2: How to blend public and private finance in funding projects?

Site	Search terms	No. of results returned	No. of results imported to EndNote
WoS	Blended finance AND (environment OR conservation OR agriculture)	54	8
GS	“blended finance” AND (environment OR conservation OR agriculture)	2,540	27

35 sources were imported to EndNote.

RQ3: What is the best implementation option for bringing in private finance?

Site	Search terms	No. of results returned	No. of results imported to EndNote
WoS	“private finance” AND investment AND (environment OR conservation OR agriculture)	443	33
GS	“private finance” AND investment AND (environment OR conservation OR agriculture)	36,200	23

56 sources were imported to EndNote.

RQ4: How can payments be structured over the life of the blended finance agreement?

Site	Search terms	No. of results returned	No. of results imported to EndNote
WoS	(“agri-environment” OR “conservation covenant”) AND payment	216	65
	Blended finance AND (farmers OR landowners OR “land managers”)	8	2
	Blended finance AND investment AND (agriculture OR conservation OR environment)	13	6
	Blended finance AND (carbon OR soil OR biodiversity OR water)	32	8
GS	(agri-environment OR “conservation covenant”) AND payment	13,600	30
	“Blended finance” AND (farmers OR landowners OR “land managers”)	862	19
	“Blended finance” AND investment AND (agriculture OR conservation OR environment)	2,450	23
	“Blended finance” AND (carbon OR soil OR biodiversity OR water)	2,210	21

174 sources were imported to EndNote.

422 total sources were imported to EndNote. 133 duplicates were removed, leaving **289 remaining sources**. **19 pieces of grey literature** were identified and recorded in the spreadsheet.