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Private finance for nature-based flood resilience

How banks, investors and insurers can help scale nature-based approaches to flood resilience

The University of Cambridge Institute for Sustainability Leadership (CISL)

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Their contributions greatly helped shape the project, but the views, findings and recommendations presented in this brief do not necessarily reflect their individual views nor those of the organisations they represent.

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Contents

Executive summary 4
Introduction 4
Flood risk is increasing in the UK 4
Using nature to create flood resilience 5
Private finance for nature-based flood resilience 5
About this project 5
Barriers to private finance 6
Solutions to scale private finance 7
Making nature financially visible 7
From a useful project to a financeable opportunity 7
Sources of revenue 8
Connecting projects, buyers and finance 9
Ten ways to support greater private-finance involvement 10
What this means for private finance 11
Social implications of using private finance 12
Conclusion 13
Appendices 14
Appendix 1. Barriers to private finance's involvement in nature-based flood resilience 14
Appendix 2. Solutions to scale private finance for nature-based flood resilience 16
Appendix 3. Potential revenue streams for nature-based flood resilience projects 20
References 22

Executive summary

Flood risk is growing in the UK, with potentially significant consequences for homes, businesses, infrastructure and the financial institutions exposed to them. This increases the need for a broader mix of prevention, protection and resilience measures. Nature-based approaches can form part of this mix, helping manage flood risk while delivering wider benefits for biodiversity, water, carbon and communities. For financial institutions, this creates opportunities to better manage the financial risks associated with flooding, strengthen the resilience of borrowers and assets, and develop new financing and risk-management solutions. However, scaling private finance for these approaches, including Natural Flood Management, will require key commercial barriers to be overcome.

This was the focus of a five-month CISL project which involved three co-creation Labs bringing together banks, investors and insurers, complemented by wider stakeholder engagement and research. Six interrelated barriers were identified. Two received particular attention: **making the flood-resilience benefits of nature visible and usable in financial decision-making**; and **creating projects with identifiable buyers and predictable revenues that can support commercial finance**.

The findings point to practical ways forward. Evidence on nature-based interventions needs to translate into financial implications that can inform lending, investment and underwriting, enabling financial institutions to better assess risk, identify resilience opportunities and allocate capital more effectively. Projects seeking private finance need credible revenues, committed buyers, appropriate risk sharing, confidence in delivery and sufficient scale. **Importantly, while revenues can come directly from flood-risk reduction, they can also come from other outcomes and activities, including biodiversity, carbon, catchment services and land-based products, potentially combining several revenue streams**. Market facilitators can also help aggregate fragmented projects and connect those creating nature outcomes with buyers and finance.

This brief identifies ten potential solutions, from actions financial institutions can take today to interventions requiring multiple market actors or policy support. Private finance will not be appropriate for every project, but where projects are commercially viable and the right market and policy conditions exist, banks, investors and insurers can complement public and philanthropic funding and help nature-based flood resilience reach greater scale.

Introduction

Flood risk is increasing in the UK

Flooding is already the UK's most costly natural hazard, and the risk is growing. **Annual flood damage is estimated at around £3.3 billion today and could rise to £4.5 billion by 2050 under 2°C of warming without additional adaptation; the number of properties affected by flooding could also increase by up to 40 per cent[1].** Climate change is increasing the frequency and severity of extreme rainfall, while land management can further reduce the landscape's capacity to retain water. Hard-engineered flood defences will remain central to managing this risk, but cannot do so alone. A wider mix of prevention, protection and resilience measures, including property-level resilience, will be needed.

Using nature to create flood resilience

Nature can help manage flood risk by *slowing water down, containing water and capturing it*[2]. Nature-based approaches, or solutions, work with or mimic natural processes to achieve these effects[3]: for example, restoring wetlands and floodplains, improving soils, planting trees in appropriate locations, restoring rivers, or using sustainable drainage and rain gardens in urban areas. In flood-risk management, these approaches are often referred to as Natural Flood Management (NFM). NFM does not replace the need for conventional flood defences, but can form part of a wider mix of measures, providing an additional line of defence and strengthening overall flood resilience.

Nature-based approaches can also provide benefits beyond flood resilience, including improved water quality, biodiversity, carbon sequestration and storage, and cultural, health and recreational value. Despite growing evidence of their effectiveness[4], however, **nature-based approaches remain underused in UK flood-risk management and are still often treated as complementary rather than a fundamental part of flood resilience[5].**

Private finance for nature-based flood resilience

Globally, finance for nature-based solutions remains dominated by public sources, while private finance represents a much smaller share[6]. For nature-based flood resilience specifically, however, the picture is less clear. In the UK, public bodies such as the Environment Agency (England), local authorities and Regional Flood and Coastal Committees have responsibilities and funding mechanisms for flood-risk management, but investment specifically in Natural Flood Management has historically been relatively limited. Private-sector involvement also remains limited and often forms part of projects pursuing wider nature, climate or resilience objectives, alongside public grants, philanthropic funding or corporate commitments[7].

The wider investment needed to manage growing flood and coastal risk is substantial. The Environment Agency has estimated that more than £1 billion a year will need to be invested over the long term to prevent flood and coastal risk from worsening in England[8], and the latest funding framework includes specific provision for Natural Flood Management[9]. Nature-based approaches represent one part of this wider response. While there is no agreed expectation for how much investment in nature-based flood resilience should come from private finance, the scale of the challenge has increased interest in how private finance could complement public investment. Private finance refers to commercial banks, asset owners, asset managers and insurers undertaking their core financial activities, including lending, investment and insurance/risk transfer. It is distinguished from public and philanthropic finance. The central question explored through this project was therefore: **How can private finance play a meaningful role in supporting the deployment at scale of nature-based flood resilience?**

About this project

This five-month CISL project was primarily a convening and co-creation exercise focused on perspectives from across private finance. **Its core was a series of three interactive co-creation Labs bringing together banks, investors and insurers**, exploring urban and property flood risk; infrastructure and systemic risk; and agriculture, land use and food-system resilience. Participants included sustainability specialists

alongside colleagues from business functions such as relationship management, underwriting, credit risk and investment analysis. Targeted interviews and wider stakeholder engagement brought in perspectives from experts and organisations developing, delivering and enabling nature-based flood resilience, while desk research provided additional evidence. Together, these activities identified barriers to private finance and explored practical actions and enabling conditions that could help overcome them.

Barriers to private finance

Financial institutions involved in this project showed clear interest in the potential of nature-based flood resilience, but identified a set of interrelated barriers that make it difficult to incorporate nature-based approaches into mainstream lending, investment and insurance decisions. Table 1 summarises the six barriers identified through the project and wider research, focusing specifically on those that are commercially relevant to banks, investors and insurers and within, or close to, their sphere of influence. Barriers relating primarily to technical project delivery or to other actors, such as landowners and flood-risk-management practitioners, are outside the scope of the project. Many of the barriers here are directly related to barriers in financing adaptation and resilience measures more broadly[10].

Table 1. Barriers to private finance's involvement in nature-based flood resilience. Full details in Appendix 1. Sources: CISL Labs (this project); Aviva[11]; European Investment Bank[12]; Green Finance Institute[13]; Infrastructure Bank[14]; University of Exeter and Santander[15].

Barrier	Description
1. Lack of integration into financial decision-making	Financial institutions struggle to translate the flood-resilience benefits of nature into financially material outcomes and decisions
2. Difficulty quantifying flood-risk reduction	It can be difficult to quantify how much flood risk a nature-based solution reduces for specific assets, locations or portfolios
3. Limited standardised evidence and track record	Financial institutions have less standardised, long-term evidence on the performance of nature-based flood solutions than for conventional flood defences
4. Benefits accrue over long time horizons	Long-term resilience benefits can be difficult to reflect in today's financial decisions and pricing
5. Limited demand from paying buyers and unclear revenue streams	Flood resilience creates value, but there are often too few identifiable buyers willing or required to pay for it, limiting the predictable revenues needed in a private finance context
6. Fragmented projects, ownership and decision-making	Nature-based flood-resilience opportunities are often small, fragmented and spread across multiple owners and decision-makers, making them difficult to finance at scale

Two issues received particularly sustained attention during the convening. First was the difficulty of translating nature-based flood resilience into financial decision-making (Barrier 1), meaning that **nature is typically invisible in financial decision-making**. The other was the limited demand from paying buyers and the resulting lack of predictable revenue streams to support finance (Barrier 5). The challenge there is not necessarily a lack of beneficiaries from project outcomes, but **a lack of identifiable buyers willing or required to make predictable, long-term payments for the benefits provided**. Without these revenues, projects may struggle to generate the cash flows needed to support commercial lending or investment. As

one Lab participant put it, "Just because nature-based flood solutions reduce flood risk does not necessarily make them bankable."

Solutions to scale private finance

Making nature financially visible

The Labs identified 'decision-useful data and metrics' as one way to better integrate nature-based flood resilience into financial decision-making. **As illustrated in Figure 1, evidence may progress from a qualitative understanding of an intervention, to quantified hydrological effects on flood risk, where data is available, and ultimately to financial implications relevant to lending, investment and underwriting**. Figure 1 does not show the physical pathway through which a nature-based intervention reduces flood risk. Rather, it shows how the evidence available to financial institutions can become increasingly decision-useful, from a qualitative understanding of the intervention, to quantified effects on flood risk, and ultimately to financial implications. In practice, these stages are connected: an intervention can change flood hazard, exposure or vulnerability; this can affect expected damage and losses, insurance availability and cost, and property or collateral values; and these effects can then feed into financial decisions. For lenders, approaches such as resilience-adjusted credit risk are particularly relevant, as they consider how expected avoided losses and improved insurability can affect the credit-risk profile of an asset or borrower[16].

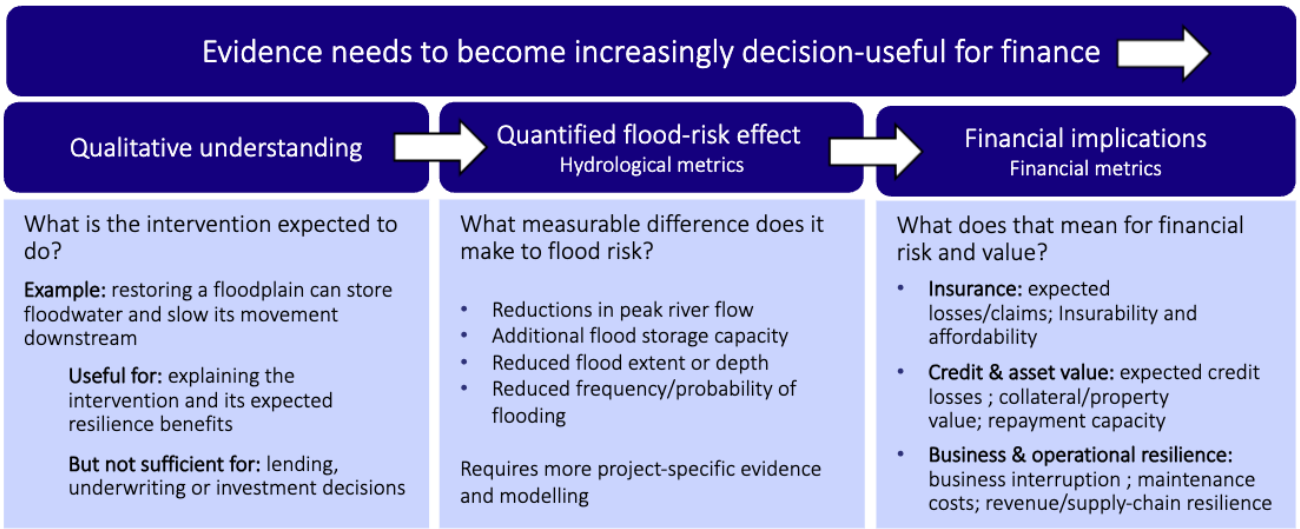

Figure 1. Making nature-based flood resilience increasingly decision-useful for finance (Solution 4. *Decision-useful data and metrics*, see further details in Appendix 2; it is particularly relevant to Barriers 1–4, see Table 1). Hydrological metrics describe how water flows, is stored and affects flooding.

From a useful project to a financeable opportunity

Attracting private finance requires nature-based projects to meet commercial requirements that may sit outside the expertise of organisations developing and delivering them. Drawing on insights gained from Lab discussions, five questions were identified that provide a useful checklist for organisations seeking

private finance (Figure 2). The questions are intended particularly for project developers and other organisations creating or delivering nature outcomes, to help them understand and address what financial institutions typically need to assess an opportunity. **Not every project will need to meet all five, but considering them can help strengthen the commercial case by increasing confidence in revenues, delivery and risk level, or reducing the costs and complexity of financing**.

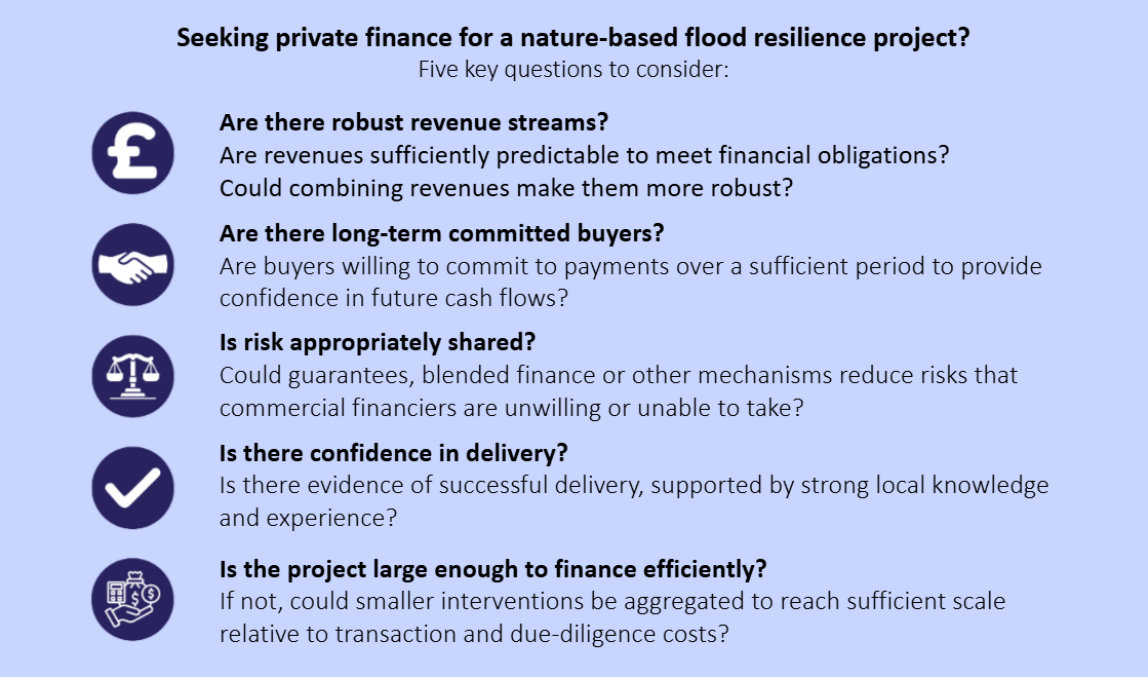

Figure 2. A checklist for attracting private finance to nature-based projects. The checklist supports *Commercially financeable project structures* (Solution 5; full details in Appendix 2) and is particularly relevant to Barriers 5–6 (see Table 1).

Sources of revenue

A nature-based project that reduces flood risk does not necessarily need to generate revenue from flood resilience itself. It may generate revenues from other outcomes and activities, including biodiversity, carbon, catchment services (eg, water quality) and land-based products. Combining revenues from different buyers or outcomes can also strengthen the business model (Table 2).

These revenue opportunities differ considerably in the source and strength of buyer demand, and in how established their markets are. Some have relatively established markets, supported by regulation or commercial demand, while others rely on voluntary demand and remain at an earlier stage of development. Biodiversity Net Gain[17] and nutrient neutrality[18], for example, create mandatory demand for particular nature outcomes. Carbon is unusual among voluntary nature-related markets in being relatively established, helped by a large pool of potential buyers that is not necessarily tied to where the nature outcome is delivered. By contrast, direct markets for flood-risk reduction remain much less developed.

This highlights an important role for policy and regulation: where environmental benefits do not generate sufficient demand on their own, policy can help create identifiable buyers and more predictable revenue

streams – turning outcomes that buyers *may* pay for into outcomes for which there is dependable demand (Solution 8. *Regulation to create markets*, see Appendix 2).

Table 2. Potential revenue streams for nature-based flood-resilience projects. Full details in Appendix 3.

Revenue opportunity	Potential buyer	What drives demand?	How established is the market?
Biodiversity gains	Developers	Mandatory	Established
Nutrient mitigation	Developers	Mandatory in designated catchments	Established
Catchment services	Water companies	Commercial / regulatory drivers	Established
Carbon credits	Corporates and others	Mostly voluntary	Established
Land-based products	Food, forestry and other buyers	Commercial	Established, but emerging when used specifically to support resilience
Nature and biodiversity credits	Corporates and others	Voluntary	Emerging
Flood-risk reduction	Infrastructure owners, businesses, public authorities	Mostly voluntary (sometimes linked to regulatory duties)	Emerging
Voluntary biodiversity/nature credits	Corporates and financial institutions	Voluntary	Emerging
Insurance-linked payments	Insurance sector/customers	Voluntary	Early-stage

Connecting projects, buyers and finance

Turning nature-based interventions into financeable opportunities often requires several actors to play different roles (Figure 3). Creators of nature outcomes deliver the interventions; **buyers** provide the revenues; **financial institutions** provide capital and risk transfer; and **policymakers** can help create and enable predictable demand. **Market facilitators** can play an important connecting role, particularly where projects, ownership and decision-making are fragmented, by aggregating interventions, helping structure revenues and financing, and connecting creators, buyers and financiers.

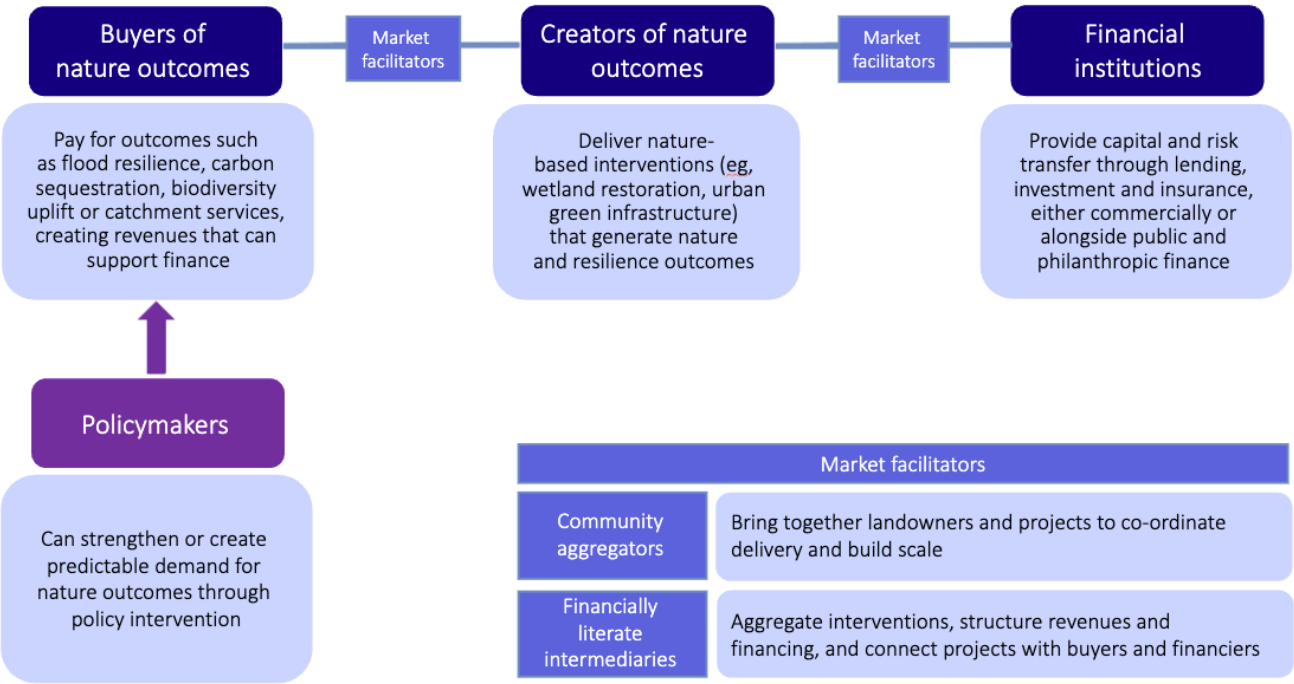

Figure 3. Connecting nature-based projects with private finance and buyers. The framework supports *Commercially financeable project structures* (Solution 5; full details in Appendix 2) and is particularly relevant to Barriers 5–6 (see Table 1). Terminology adapted and expanded from Great Yellow's 'GY Triangle' framework[19].

Different financing models are possible. In the Wyre River Natural Flood Management Project[20], beneficiaries of reduced flood risk pay for the interventions, helping support a nine-year £850,000 commercial loan from Triodos Bank UK alongside grant funding, with carbon and biodiversity providing additional revenue streams. By contrast, the Greater Manchester Environment Fund[21] explored financing peatland restoration through grant and patient capital, with potential future revenues from carbon and biodiversity sales; flood-risk reduction would therefore be an additional benefit rather than the primary revenue stream.

Market facilitators can help turn fragmented opportunities into projects that private finance can assess and finance. Community aggregators – such as local Wildlife Trusts, Rivers Trusts and farmer clusters, and more recently the FloodAction Coalition[22] – can bring together landowners and projects across a catchment and co-ordinate delivery. Financially literate intermediaries (eg, Great Yellow[23] and Finance Earth[24]) can help aggregate interventions, structure revenues and financing, and connect project developers with buyers and financiers. Together, these functions can help overcome the small scale and fragmentation of many nature-based flood-resilience opportunities (Barrier 6. *Fragmented projects, ownership and decision-making*, see Table 1).

Ten ways to support greater private-finance involvement

The project identified ten potential solutions to address the barriers to greater private-finance involvement (Table 3). They emerged primarily from the co-creation Labs and were subsequently tested and refined through wider stakeholder engagement and CISL desk research, drawing also on existing research and initiatives (eg, Butler[25], European Investment Bank[26], Green Finance Institute[27], and University of Exeter and Santander[28]).

Table 3. Ten potential solutions for increasing private-finance involvement in nature-based flood resilience. Full details in Appendix 2.

Solution	Description
Actions that financial institutions can take today	
1. Build on established financial approaches	Adapt established approaches from catastrophe modelling, climate risk and environmental insurance rather than starting from scratch. For instance, build on emerging 'before-and-after' models for nature-based approaches, or adapt existing models to account for the contribution of nature
2. Innovative insurance and financing mechanisms	Explore innovative insurance and financing mechanisms that can recognise and reward the risk-reduction benefits of nature-based approaches
3. Stewardship, engagement and disclosure	Use stewardship and engagement to encourage companies to make the financial value of nature-based approaches more visible through reporting and disclosures (eg, Assess and Prepare steps of the Taskforce on Nature-related Financial Disclosures (TNFD) framework[29])
Actions requiring multiple market actors	
4. Decision-useful data and metrics	Translate flood-resilience benefits of nature-based approaches into financially material metrics
5. Commercially financeable project structures	Structure nature-based projects to provide sufficient confidence in revenues, delivery and risk, while achieving a scale that makes private finance viable
Policy interventions	
6. Flood resilience certification[30]	Make flood resilience visible and recognisable in financial and insurance decisions
7. Planning and grey-green infrastructure	Strengthen and extend the integration of nature-based approaches into planning[31] and infrastructure
8. Regulation to create markets	Create and enable predictable demand for flood resilience and nature outcomes more broadly, through regulation, inspired by Biodiversity Net Gain[32]
9. Fiscal incentives	Use fiscal incentives to strengthen the financial case for investing in flood resilience
10. Community insurance incentives	Use community insurance incentives to reward investment in local flood resilience

The solutions range from actions financial institutions can take today to changes requiring wider market or policy intervention. Solutions 1–3 can largely be pursued by financial institutions themselves; Solutions 4–5 require contributions from multiple market actors; and Solutions 6–10 depend principally on policy intervention. Solutions 4 and 5 are explored in greater detail earlier in the brief because they directly relate to the two barriers that received most attention during the Labs: integrating nature into financial decision-making (Barrier 1) and creating commercially financeable project structures, including predictable revenues (Barrier 5). The solutions are not intended as an exhaustive set of recommendations, but as practical actions, enabling conditions and areas for further exploration.

What this means for private finance

Different parts of private finance can contribute in different ways (Table 4). Banks can provide lending; asset owners can allocate long-term capital and shape investment mandates; asset managers can invest and manage capital; and insurers can provide risk transfer, recognise resilience through underwriting and help emerging nature markets develop.

Table 4. How financial institutions can support nature-based flood resilience through their distinct roles.

Financial institutions	What they bring	What they are looking for	Examples
Banks	Lending, credit-risk assessment and management of existing loan portfolios	Predictable cash flows, repayment capacity, reduced credit risk, evidence that long-term resilience benefits can be reflected in current credit and valuation decisions	Loans to commercially viable nature-based projects and interventions; incorporating resilience into mortgage and other lending decisions; financing clients' grey-green infrastructure; recognising how resilience interventions affect physical risk, insurance availability and affordability, collateral values and credit risk within existing lending portfolios
Investors – **Asset owners**	Long-term capital allocation	Attractive risk-adjusted returns, resilient portfolios, opportunities aligned with long-term liabilities and investment objectives	Allocating capital to natural capital and infrastructure strategies; setting investment mandates that support nature-based approaches; stewardship expectations for asset managers
Investors – **Asset managers**	Investment and management of capital on behalf of asset owners	Attractive risk-adjusted returns, sufficient scale and liquidity, portfolio diversification	Natural capital and infrastructure funds; equity/debt investment in aggregated nature-based projects and interventions; stewardship and engagement with investee companies
Insurers	Insurance, risk transfer, risk management	Lower losses, improved insurability, resilience of insured assets, risk-management services in the development of nascent markets	Recognising nature-based approaches in underwriting, innovative financing mechanisms (eg, parametric insurance), investing in prevention, insuring outcomes of nature-based projects

These different roles are already starting to emerge in practice. For banks, the Wyre/Triodos example discussed earlier shows how commercial lending can support a nature-based flood resilience project. Institutional investors can provide capital at a different scale: Rebalance Earth[33], for example, is developing a model that aggregates nature restoration projects into portfolios that can attract institutional investment, including from pension funds[34]. Insurers can contribute through risk transfer and underwriting, but also by helping emerging nature markets develop: specialist insurers[35] in carbon markets, for example, cover risks such as the non-delivery of carbon credits, providing greater confidence to buyers and investors and helping support access to finance.

Social implications of using private finance

Nature-based flood resilience can deliver significant benefits for people and communities, but these benefits and associated costs may not be evenly distributed. Interventions can involve trade-offs, for example where changes in land use or management affect landowners or existing livelihoods. Increasing the role of private finance raises additional questions about who benefits and who may be left behind. **Commercial capital will favour opportunities offering attractive risk-adjusted returns, which may not align with areas of greatest social need.** This could exacerbate inequalities, while making flood resilience more visible in lending and insurance decisions could disadvantage people in higher-risk areas.

Conclusion

Nature-based approaches have an important role to play as part of a wider mix of measures for managing growing flood risk. Scaling their use will require action across the system – from organisations developing and delivering projects and buyers of nature outcomes to financial institutions and policymakers. Despite the barriers identified, the CISL-convened Labs showed strong interest from financial institutions in playing a meaningful role in scaling nature-based flood resilience.

The key opportunity is therefore to identify where different parts of private finance can add value. This means making resilience visible in financial decisions, developing projects with credible revenues and manageable risks, and creating the market and policy conditions that allow viable opportunities to emerge. Nature-based flood resilience is not only an environmental outcome: it can also help protect the long-term resilience and value of assets and businesses, while creating opportunities for lending, investment and risk transfer. Private finance will not be appropriate for every project, but where these conditions are in place it can complement public and philanthropic funding and help nature-based flood resilience reach greater scale.

Appendices

Appendix 1. Barriers to private finance's involvement in nature-based flood resilience

Sources: CISL Lab (this project); Aviva[36]; European Investment Bank[37]; Green Finance Institute[38]; Infrastructure Bank[39]; University of Exeter and Santander[40].

Barrier	Description
Barrier 1. Lack of integration into financial decision-making *Financial institutions struggle to translate the flood-resilience benefits of nature into financially material outcomes and decisions*	Financial institutions struggle to translate the flood-resilience benefits of nature-based approaches into financially material outcomes that can be incorporated into lending, investment and underwriting decisions. These may include reduced likelihood of flooding, lower expected damage and losses, lower credit risk, improved insurability, property value protection, improved collateral resilience, reduced business interruption and improved supply-chain resilience. Although environmental and flood-risk data is becoming increasingly available, translating this into the metrics and models used by financial institutions remains complex and time-intensive. Existing financial and insurance models generally lack the granularity needed to recognise local nature-based resilience measures, and this is especially true when it comes to local nature-based solutions that may indirectly benefit an insured property.
Barrier 2. Difficulty quantifying flood-risk reduction *It can be difficult to quantify how much flood risk a nature-based solution reduces for specific assets, locations or portfolios*	It can be difficult to quantify how much flood risk a nature-based intervention reduces for specific assets, locations or portfolios. Doing so requires suitable baseline and performance data, for example on peak flows, flood storage or changes in flood frequency and severity. Assessments are often bespoke, site-specific and costly, which can make results difficult to compare across projects or incorporate into standardised risk models. For these effects to inform lending, investment and underwriting, they need to be measurable at sufficient spatial and temporal resolution through existing or adapted flood-risk and catastrophe models.
Barrier 3. Limited standardised evidence and track record *Financial institutions have less standardised, long-term evidence on the performance of nature-based flood solutions than for conventional flood defences*	Compared with conventional flood defences, financial institutions have access to less standardised, long-term evidence on the performance of nature-based flood solutions across different flood events, environmental conditions and maintenance regimes. Evidence on durability, maintenance requirements and whole-life costs is also less mature. This can make it harder for financial institutions to assess long-term performance and risk with the same confidence as for more established forms of flood infrastructure. There are also relatively few commercially financed examples from which lenders and investors can assess financial performance and risk-return characteristics.

Barrier	Description
Barrier 4. Benefits accrue over long time horizons *Long-term resilience benefits can be difficult to reflect in today's financial decisions and pricing*	Nature-based flood resilience can deliver benefits over long periods, but financial products, pricing and risk assessments are often reviewed on much shorter cycles. This does not necessarily mean that financial institutions have short underlying exposures: for example, a mortgage may create exposure over 20–30 years even if the product is repriced more frequently. The challenge is therefore whether long-term resilience benefits can be evidenced with sufficient confidence and reflected in current lending, underwriting, valuation and investment decisions. Different parts of finance also experience flood risk over different horizons: insurance commonly operates on annual cycles, while banks and investors may have medium- or longer-term exposures. These parts of the system are connected, however, because declining insurance availability or affordability can affect lending, investment and asset values.
Barrier 5. Limited demand from paying buyers and unclear revenue streams *Flood resilience creates value, but there are often too few identifiable buyers willing or required to pay for it, limiting the predictable revenues needed in a private finance context*	Just because nature-based flood solutions reduce flood risk does not necessarily make them bankable. Many of the flood-resilience benefits they generate have the characteristics of a public good: multiple parties benefit, but there is often no clear mechanism requiring or incentivising beneficiaries to pay for those benefits. The challenge is therefore not necessarily a lack of beneficiaries, but a lack of identifiable buyers willing or required to make predictable, long-term payments for the benefits provided. Without these revenues, projects may struggle to generate the cash flows needed to support lending or investment. A related but distinct challenge is the free-rider problem. Because flood-risk reduction can benefit multiple parties, some may benefit without contributing to its cost. This can make collective payment difficult and create a first-mover disadvantage – for example, where one insurer contributes to reducing flood risk while competing insurers also benefit from lower losses without contributing. For private finance, identifying who will pay, for what, and for how long, and how those revenues can support debt repayment or investment returns, is therefore critical.
Barrier 6. Fragmented projects, ownership and decision-making *Nature-based flood-resilience opportunities are often small, fragmented and spread across multiple owners and decision-makers, making them difficult to finance at scale*	Delivering nature-based flood solutions often requires co-ordination of numerous small, sometimes bespoke nature-based projects and interventions across multiple landowners, local authorities, developers and infrastructure managers (supply-side fragmentation). This makes nature-based interventions more complex and slow to develop and finance (because of, eg, high transaction and due diligence costs) than larger, aggregated and more standardised opportunities. Ownership can be fragmented across multiple landowners, particularly for interventions delivered at catchment scale, making it difficult to identify decision-makers, insurable interests and funding responsibilities, creating governance and financing challenges. There are also few mechanisms or intermediaries (eg, community aggregators and/or financially literate aggregators) capable of bundling multiple small projects/interventions into opportunities of sufficient scale for private finance requirements

Appendix 2. Solutions to scale private finance for nature-based flood resilience

Sources: CISL Lab (this project); Butler[41]; European Investment Bank[42]; Green Finance Institute[43]; University of Exeter and Santander[44].

Solution	Description
	Actions that financial institutions can take today
Solution 1. Build on established financial approaches *Adapt established approaches from catastrophe modelling, climate risk and environmental insurance rather than starting from scratch*	Financial institutions can build on methodologies and tools that are already well established in other areas of finance, rather than developing entirely new approaches to support decision-making on nature-based approaches for flood resilience. Examples include catastrophe modelling, where 'before-and-after' models for nature-based approaches are beginning to emerge and existing models can be adapted to account for the contribution of nature (eg, by adjusting model parameters), as well as climate risk assessment and soil health metrics already used in agricultural finance. Environmental liability insurance also offers useful lessons, having long incorporated environmental data into underwriting and, more recently, developed products that support investments delivering positive environmental outcomes. Investors can similarly build on existing investment routes. Where individual nature-based projects are too small or fragmented for listed-equity strategies to invest in directly, investors can gain exposure through listed companies that enable their delivery, such as engineering and environmental consultancies, water-technology companies and other service providers. Immediate implementation actor: financial institutions
Solution 2. Innovative insurance and financing mechanisms *Explore innovative insurance and financing mechanisms that can recognise and reward the risk-reduction benefits of nature-based approaches*	Innovative insurance and financing mechanisms could provide new ways to recognise and reward the risk-reduction benefits of nature-based approaches. Parametric insurance provides one example. Rather than requiring the exact reduction in flood losses attributable to a nature-based intervention to be calculated, parametric products pay according to predefined, independently measured triggers, such as rainfall or river levels. Historical data is used to calibrate these triggers and assess their probability. Where nature-based interventions reduce the frequency or severity of the relevant hazard over time, this could increasingly be reflected in the underlying risk and potentially in the pricing of renewed cover. This approach does not remove the need for robust data or careful product design, and parametric insurance can create basis risk where the trigger does not closely match actual losses. Its availability also depends on national insurance regulation. Other mechanisms could link resilience more directly to financing. Resilience bonds, for example, can connect investment in measures that reduce physical risk with insurance or capital-market structures, allowing the financial benefits of lower expected losses to help support investment in resilience. Such approaches remain relatively nascent but illustrate how risk reduction and financing can potentially be brought together within the same financial structure[45]. Existing lending can also be adapted to reflect the characteristics of nature-based projects. For example, the Wyre River Natural Flood Management Project uses a nine-year sustainability-linked commercial loan at 6 per cent, with the interest rate reduced by one percentage point if agreed biodiversity targets are met, hence rewarding nature outcomes. The loan also

Solution	Description
	allows funds to be drawn over the first three years, with repayments beginning in year four, helping to align financing with the timing of project delivery and the emergence of nature-related benefits (Barrier 4. *Benefits accrue over long time horizons*)[46]. **Immediate implementation actor:** financial institutions
Solution 3. Stewardship, engagement and disclosure *Use stewardship and engagement to encourage companies to make the financial value of nature-based approaches more visible through reporting and disclosures (eg, Assess and Prepare steps of the TNFD framework)*	Financial institutions can encourage companies to make the financial benefits of nature-based approaches more explicit in their financial reporting or accompanying disclosures (eg, Assess and Prepare steps of the TNFD framework[47]). This could include demonstrating reduced flood-related costs, improved asset and operational resilience, or expected future returns from investments in climate and nature solutions. Making these benefits visible would create clearer financial signals for investors, helping ensure that the value of nature-based approaches is recognised rather than remaining hidden within broader corporate financing. Financial institutions can additionally incorporate nature-based considerations into post-investment engagement and stewardship discussions with portfolio companies. **Main implementation actor:** financial institutions
	Actions requiring multiple market actors
Solution 4. Decision-useful data and metrics *Translate flood-resilience benefits of nature-based approaches into financially material metrics*	The key challenge is to translate ecological and hydrological evidence into information that can be used in existing financial decisions (Figure 1). Taking lenders as an example, this is likely to require sufficiently granular geospatial attribution to specific assets or portfolios, a credible baseline or counterfactual, quantified uncertainty, evidence on the persistence of the intervention, and validation of the models used. The resulting evidence also needs to be capable of translating into existing credit-risk, collateral and valuation frameworks. **Immediate implementation actor:** This translation will require contributions from several actors: organisations developing and delivering nature-based projects can provide intervention and performance data; researchers and nature-tech providers can quantify effects on flood risk; established data and modelling providers can incorporate these effects into recognised models and tools; and financial institutions can determine which outputs are sufficiently decision-useful and apply them in lending, investment and underwriting decisions
Solution 5. Commercially financeable project structures *Structure nature-based projects to provide sufficient confidence in revenues, delivery and risk, while achieving a scale that makes private finance viable*	Nature-based projects and interventions seeking private finance need to meet the commercial requirements of lenders and investors. In practice, this means providing sufficient confidence that revenues can support debt repayment or investment returns, that risks are appropriately managed, and that the opportunity is of sufficient scale to justify the costs of due diligence and financing. For debt finance, suitable collateral can also strengthen the financing case, where it provides lenders with additional security alongside expected cash flows. Not every project will need all of the features below, but they can help strengthen its commercial case (Figure 2): • Robust revenue streams. Revenues need to be sufficiently predictable to support financial obligations. Where appropriate, combining revenues from different buyers or outcomes can reduce reliance on a single source. This might include conventional income, such as agriculture or forestry,

Solution	Description
	alongside revenues from carbon, biodiversity, water-related benefits or potentially flood-risk reduction (see Table 2 and Appendix 3). • Long-term contracted buyers. Contractual commitments from buyers can provide greater certainty over future cash flows and help align revenues with the investment horizons of lenders and investors. Buyers might pay for ecosystem services or conventional products such as agricultural produce or timber. • Appropriate risk sharing. Guarantees, blended finance, insurance or other mechanisms can reduce risks that commercial financiers are unwilling or unable to take, for example where revenues or project performance are uncertain. • Confidence in delivery. A strong delivery track record and knowledge of local flood risks and appropriate interventions can increase confidence in project performance and resilience outcomes. This may also reduce some costs associated with financing and insurance. • Sufficient scale or aggregation. Bringing multiple smaller interventions together can help create opportunities of sufficient scale to justify transaction and due-diligence costs, while potentially creating economies of scale and opportunities for portfolio diversification. Regarding risk-sharing, the new (2026) Environment Agency funding rules[48] could support greater investment in Natural Flood Management (NFM), with a minimum share of flood investment allocated to NFM. They could also improve project viability by providing public funding for up to 90 per cent of eligible NFM costs, meaning that private finance may only be required for the remaining share and reducing the amount of commercial capital at risk. Greater clarity and consistency on 'stacking' rules across nature markets (eg, as part of the UK Government's Nature Markets Framework) could help close the remaining funding gap by allowing distinct benefits from the same NFM project – such as carbon sequestration, biodiversity gains and flood-risk reduction – to generate complementary revenue streams, while avoiding double counting. This could enable private payments for these benefits to complement public funding and further strengthen project viability. **Main implementation actor:** organisations developing and delivering nature-based projects, supported where needed by market facilitators, buyers and financial institutions (Figure 3)
	Policy interventions
Solution 6. Flood resilience certification *Make flood resilience visible and recognisable in financial and insurance decisions*	Build on the emerging Flood Performance Certificates (FPCs, piloting to commence in 2026)[49] to make property-level flood resilience easier for households, lenders and insurers to understand and recognise in financial decisions. FPCs are intended to focus on the property itself, including practical resilience measures that can reduce damage when flooding occurs. Landscape-scale measures, including nature-based interventions in the surrounding area, would instead need to be reflected in flood maps and risk models used by lenders and insurers if their risk-reduction benefits are to influence underwriting, lending and valuation decisions. Greater visibility of flood resilience could help recognise the value of resilience investment, but it

Solution	Description
	could also have unintended consequences. Greater differentiation of flood risk and resilience may affect mortgage availability, pricing or property values, particularly for households unable to undertake resilience measures. Any certification or related information framework should therefore consider consumer, distributional and conduct implications. **Immediate implementation actor:** policymakers
Solution 7. Planning and grey-green infrastructure *Strengthen and extend the integration of nature-based approaches into planning and infrastructure*	Build on existing planning policy[50] and standards that already promote nature-based approaches to surface-water management in new development. Strengthen their consistent implementation, while extending the use of nature-based and hybrid ('grey-green') approaches to existing developments and infrastructure, retrofit schemes, and a wider range of flood risks. This would help move beyond a focus on new development and surface-water drainage, embedding nature-based flood resilience more systematically across the built environment and infrastructure. Localised grey-green approaches can also make flood-resilience benefits easier to attribute to specific assets, helping banks incorporate them into lending and credit-risk decisions and insurers into underwriting and risk assessment. **Immediate implementation actor:** policymakers
Solution 8. Regulation to create markets *Create and enable predictable demand for flood resilience and nature outcomes more broadly, through regulation*	Create and enable predictable (ie, mandatory) demand for flood resilience, and nature outcomes more broadly, by building on existing regulatory markets, such as Biodiversity Net Gain (BNG, England) and nutrient neutrality (where mandatory). One potential direction would be to extend the principles of BNG (eg, through a 'Water Net Gain'[51] approach) so that regulation also recognises flood- and drought-resilience outcomes delivered by nature-based solutions. Such an approach could support larger, nationally significant flood resilience projects/interventions, rather than remaining focused on local biodiversity outcomes alone. It could also stimulate new commercial markets, including insurance products that protect the delivery of flood-resilience outcomes, in a similar way to how BNG has driven innovation in biodiversity-related insurance[52]. **Main implementation actor:** policymakers
Solution 9. Fiscal incentives *Use fiscal incentives to strengthen the financial case for investing in flood resilience*	Create stronger incentives for investing in nature-based approaches through fiscal measures such as a 'fee-bate' scheme, whereby a baseline risk-based levy (informed by flood models) is applied but reduced for those investing in flood resilience. By improving the financial returns from prevention, such measures would strengthen the business case for nature-based approaches and make their financial value more visible to investors. Introducing a new levy would, however, require political support and may be challenging to implement, particularly where it is perceived as an additional cost to households or businesses. Fiscal incentives are therefore more likely to gain public and political support if underpinned by a robust business case demonstrating that early investment in nature-based approaches reduces future public expenditure while delivering multiple co-benefits. **Main implementation actor:** policymakers
Solution 10. Community insurance incentives	Develop insurance schemes that reward collective investment in flood resilience[53]. Under this approach, community-level actions to reduce flood risk through nature-based approaches could trigger lower insurance

Solution	Description
Use community insurance incentives to reward investment in local flood resilience	premiums for participating properties or communities. By linking financial rewards to collective action, such schemes could help overcome the free-rider problem while creating a direct financial incentive to invest in resilience. **Main implementation actor:** policymakers (working with the insurance sector)

Appendix 3. Potential revenue streams for nature-based flood resilience projects

*** Demand drivers** are classified as: **mandatory**, where a legal or regulatory requirement creates demand for the outcome; **commercial**, where a buyer pays because the outcome provides a business or financial benefit; and **voluntary**, where a buyer chooses to pay without a legal or regulatory requirement or sufficiently direct commercial benefit. Some revenue streams may have more than one demand driver.

**** Market maturity** is classified as: **established**, where functioning markets or payment mechanisms already exist; **emerging**, where models are being developed or tested but are not yet widely used; and **early-stage**, where potential payment mechanisms have been proposed but there is limited evidence of implementation.

Out of scope: project funding used primarily to develop or deliver the intervention and its outcomes, as well as payments for inputs such as land access, which form part of the costs of creating those outcomes.

Sources: Finance Earth[54]; Green Finance Institute[55]; University of Exeter and Santander[56].

Revenue opportunity	Potential buyer	What drives demand? *	How established is the market? **
Biodiversity gains Pay for Biodiversity Net Gain[57] units (where biodiversity gains cannot be delivered sufficiently on-site). Note: from November 2026, Nationally Significant Infrastructure Projects (NSIPs), such as energy projects, major roads and railways, ports, airports and major water-resource infrastructure, will also be in scope.	Housing, commercial and industrial developers, whether public (incl. authorities) or private	Mandatory	Established
Nutrient mitigation Pay for nutrient neutrality[58] credits if their projects would otherwise add nutrient pollution to protected catchments.	Housing/property developers	Mandatory (in designated catchments)	Established

Revenue opportunity	Potential buyer	What drives demand? *	How established is the market? **
Catchment services Pay for upstream catchment management to help meet WINEP (Water Industry National Environment Programme[59]) environmental obligations, including improving water quality (ie, reduce sediment, nutrients and other pollutants entering water), protecting water resources and assets, and supporting wider catchment resilience. Flood resilience may be one of several outcomes delivered, rather than the primary service purchased	Water companies	Commercial/ regulatory drivers	Established
Carbon credits Pay for carbon credits (eg, Woodland Carbon Code, Peatland Code) for Corporate and Social Responsibility (CSR) purposes, or against net zero ambitions	Corporates (incl. financial institutions)	Mostly voluntary	Established
Nature and biodiversity credits Pay for nature/biodiversity credits to contribute to nature recovery or meet corporate nature commitments	Corporates (incl. financial institutions)	Voluntary	Emerging
Land-based products Pay for agricultural, forestry or other land-based products, providing an established revenue stream that can be combined with revenues from nature outcomes. This may include premium prices for products associated with improved environmental performance. Long-term purchasing commitments can provide greater revenue certainty, supporting landowners to invest in nature-based flood resilience while strengthening supply-chain resilience	Retailers, food companies and other buyers of land-based products	Commercial	Established (traditional commodities), but emerging when used specifically to support resilience
Flood-risk reduction Pay for upstream flood-resilience outcomes that reduce risks to assets and operations, such as avoided damage, maintenance costs and service disruption	Infrastructure and asset owners/operators	Voluntary (sometimes linked to regulatory duties)	Emerging
Flood-risk reduction Pay for flood-resilience outcomes delivered by nature-based approaches through ongoing payments, creating a revenue stream for projects. In practice, authorities more commonly fund or commission nature-based approaches directly than purchase outcomes through long-term contracts	Local authorities / flood-risk management authorities	Voluntary	Emerging
Flood-risk reduction Pay for flood-resilience outcomes where nature-based approaches can reduce risks to sites, operations or supply chains (= Nature-as-a-Service)	Businesses exposed to flood risk	Voluntary	Emerging
Insurance-linked payments Pay for a proportion of insurance premiums, commissions or profits to be channelled into local nature-based approaches that reduce underlying flood risk	Insurance customers / insurers / insurance intermediaries	Voluntary	Early-stage

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