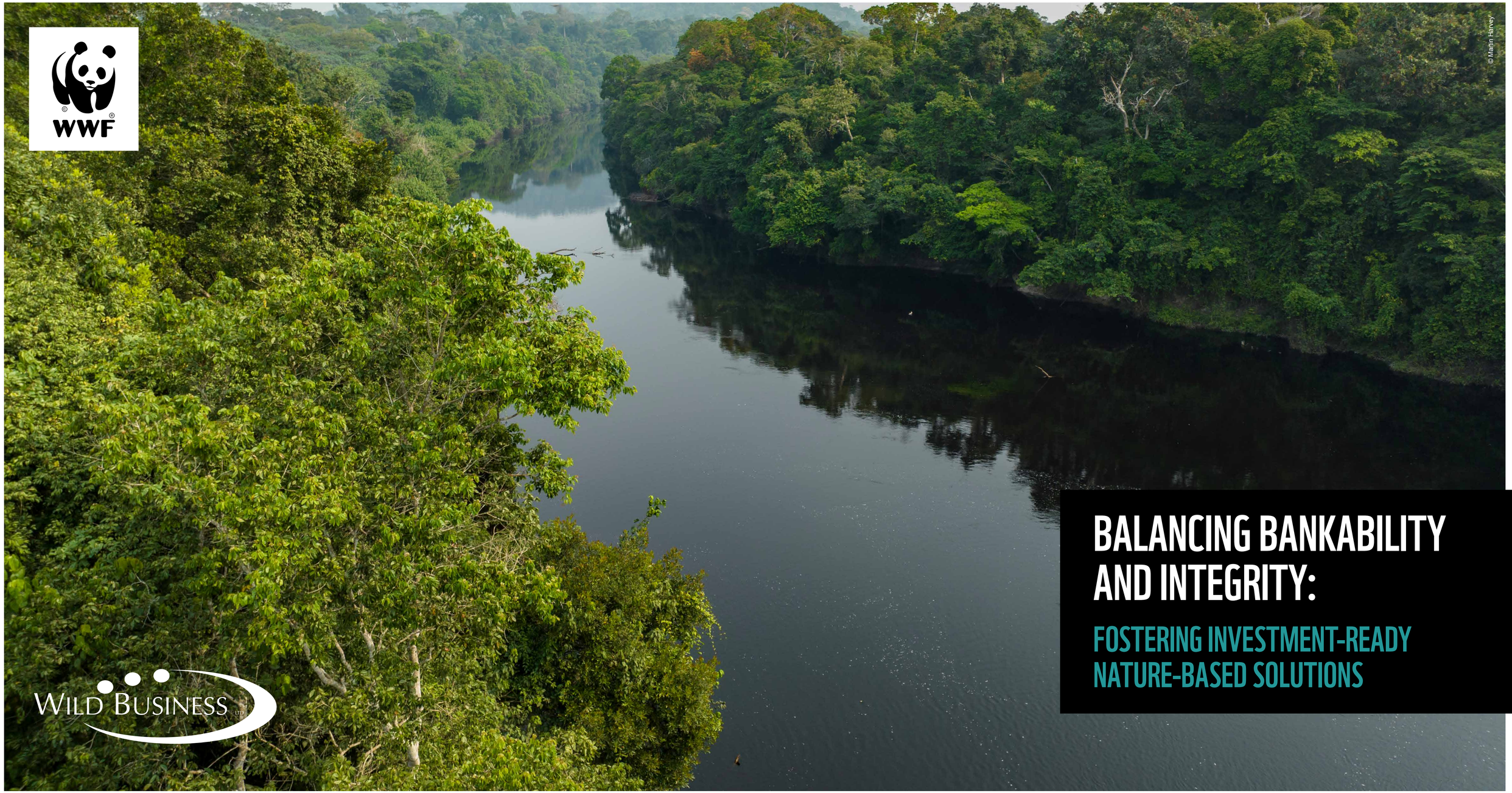

BALANCING BANKABILITY AND INTEGRITY:

FOSTERING INVESTMENT-READY NATURE-BASED SOLUTIONS

WWF

WILD BUSINESS LTD

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ABOUT WWF

We're WWF, the leading global environmental charity and we're bringing our world back to life. We're tackling the causes of nature loss. And we're finding solutions so future generations inherit a world where nature is thriving and the climate is stable.

ABOUT THE CLIMATE SOLUTIONS PARTNERSHIP

This report has been prepared by WWF's NbS Accelerator (NbSA) team, which is supported by the Climate Solutions Partnership (CSP). The Climate Solutions Partnership is a five-year philanthropic collaboration between WWF, World Resources Institute (WRI) and HSBC. It aims to scale up nature-based solutions, remove deforestation from palm oil supply chains, increase sustainable production and consumption and help transition the energy sector in Asia towards renewables.

The NbSA, through targeted technical assistance, helps projects become investment-ready and deliver financial, social, climate and ecological benefits.

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CONTENTS

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EXECUTIVE SUMMARY

As societies face climate change and biodiversity crises, mobilising investment from a range of sources is vital for scaling nature-based solutions (NbS) that deliver significant ecological and social benefits. Annual investments in nature-based solutions need to nearly triple from US$200 billion to US$542 billion by 2030 to meet climate, biodiversity and land degradation targets [1]. This report explores the opportunities and challenges of private finance in NbS for investors, practitioners, standard setters and regulators.

With increasing emphasis on attracting private capital to complement public funding – under frameworks such as the Kunming-Montreal Global Biodiversity Framework – private investment holds potential to significantly support nature finance. Private finance can foster innovation, efficiency and scalability, providing resources necessary for the ecological and social impacts essential for high-integrity investments (Box 2). From 2020 to 2024 flows labelled as 'nature finance' have been reported to increase significantly, rising elevenfold in four years from US$9.4 billion to over US$102 billion [2].

NbS offer significant opportunities to deliver financial, ecological and social benefits. For NbS projects interested in harnessing private finance, aligning them with commercial goals demands a rigorous and holistic approach. Achieving bankability – often driven by near-term returns – can align with delivering high-integrity outcomes that create enduring positive impacts. With a rigorous, holistic approach, potential risks – such as insufficient additionality, leakage, impermanence or social equity concerns – can be managed. There are successful examples globally where this balance has been effectively achieved. However, as the market expands, a deeper understanding is emerging of the risks and tensions involved in designing NbS for people, nature and climate – while also meeting private finance requirements. Ensuring that private finance growth translates into tangible positive impacts on people, nature and climate is essential for achieving meaningful and lasting outcomes.

This report is informed by interviews, a literature review and insights from WWF's experience in the Nature-based Solutions (NbS) Accelerator programme. Specifically, it draws on interviews conducted in June and July 2024 with private finance stakeholders, academics and experts. These discussions underpin an analysis of key considerations for mobilising private NbS finance, with a focus on identifying any tensions that can arise between bankability and high-integrity, and solutions to these. The report concludes with tailored guidance for investors, developers and standard setters to support the development of robust and impactful NbS finance strategies.

TENSIONS BETWEEN BANKABILITY AND INTEGRITY FOR NBS

The research identified four key categories of tensions between bankability and integrity for NbS. While these tensions are not necessarily barriers, recognising them enables more effective management. This report examines these tensions with a solutions-oriented approach, aiming to navigate challenges and unlock the full potential of NbS. **The four categories of tensions are:**

- **Temporal mismatch:** While long-term stakeholder engagement and ecological management are vital for NbS success, they may conflict with investors' short-to-medium-term return expectations to compensate for uncertainties, pressuring prioritisation of short-term outputs over lasting outcomes for people and nature.
- **Value mismatch:** Private investors, driven in part by profit-oriented organisational structures, often prioritise measurable impact such as carbon removal or biodiversity gains, which align with investment frameworks and reporting requirements. In contrast, other stakeholders, such as local communities, may prioritise socio-cultural and ecological benefits that are harder to quantify. This divergence can create trade-offs that risk marginalising local perspectives, undermining ecological integrity and broader social goals.
- **Governance challenges:** Driven by risk aversion and conventional investment norms, investors' expectations for certainty and control can conflict with participatory decision-making. This process often involves diverse stakeholders, complex trade-offs and longer timelines, increasing the risk of tokenistic engagement or shortcuts that erode ecological integrity, social values and human rights.

- **Stakeholder risk-benefit imbalances:** Poorly designed NbS can leave project developers and local communities to bear significant risks with limited rewards, while investors and intermediaries secure higher returns, justified by perceived risks in volatile or emerging markets. While sufficiently high returns for investors are necessary to attract sought-after capital, incentive structures may prioritise financial gains over equitable benefit-sharing, increase pressure on local stakeholders and reinforce inequities driven by locally mediated power imbalances, elite capture, corruption, or conflicts where they occur. This could in turn perpetuate inequities and disproportionately affect marginalised groups, including Indigenous peoples, women and those with limited resources or decision-making power.

MANAGING TENSIONS, STRENGTHENING ACCOUNTABILITY AND ENSURING LONG-TERM SUCCESS

The tensions listed above highlight the need for effective risk management to ensure they do not hinder the integrity of aspiring bankable NbS. The report highlights often insufficient risk management for privately financed NbS, usually stemming from those same tensions between financial and integrity goals. Mechanisms like sustainability certifications, KPIs and safeguards are important but insufficient to ensure meaningful social and ecological outcomes. Key issues include overly generic safeguards, simplified metrics and lack of context-specific standards, limiting their suitability for complex needs. Weak enforcement, self-reporting of conflicts, limited community engagement and high costs can result in superficial application, undermining protections for nature and communities. To strengthen accountability and ensure long-term success, this report advocates for:

THINK LONG-TERM

Long-term monitoring and funding: Effective NbS requires sustained monitoring, adaptive management and reliable financing to align private capital with long-term ecological and social goals. The report recommends contingency funds, phased environmental credit releases, ex-post credit issuance tied to results and long-term agreements like conservation covenants. These should be paired with robust design and impact accounting to ensure additionality, permanence and minimised leakage. Sustainable impact in NbS relies on fostering trust, accountability and resilience through collaboration with Indigenous peoples and local communities (IPs&LCs) and their trusted intermediaries. Adaptive decision-making is crucial for addressing ecological and social complexities while meeting investors' expectations. Where long-term, trusted relationships are not established, blended finance mechanisms can help address temporal mismatches in early-stage NbS projects with limited commercial viability. Ultimately, these approaches can help bridge the divide between the short-term timelines of investors and the long-term requirements of NbS, driving resilient and sustainable outcomes.

INVEST FOR IMPACT

Aligning financial returns with ecological and social benefits: This is key to ensure the success of NbS projects and by extension, investor financial returns. KPIs should focus on absolute biodiversity gains rather than merely reducing losses, particularly in high-biodiversity areas. While this approach enhances ecological outcomes, it requires balancing biodiversity focused land uses with land uses focused on social or economic value, supported by fair compensation. Additionally, social impact monitoring should be comprehensive, evaluating dimensions such as equitable benefit-sharing, community well-being and cultural heritage. Incorporating frameworks like WWF's Environmental Social Safeguards Framework and local or traditional ecological knowledges (LEK and TEK, respectively), fosters inclusive, legitimate and culturally appropriate NbS solutions and metrics.

To achieve this alignment, it is essential to build the capacity of financial stakeholders to integrate socio-cultural and ecological dimensions into investment decisions. Training initiatives can equip investors to evaluate intangible benefits and adopt inclusive NbS solutions, contributing to aligning financial priorities with high-integrity goals.

GOVERNANCE AND POWER-SHARING

Inclusive governance, early community dialogue and power-sharing: Inclusive governance and early community engagement are vital for NbS success, fostering participatory decision-making, conflict resolution and power-sharing, to align conservation efforts with socio-cultural values. Incorporating LEK and TEK alongside scientific methods fosters resilience and legitimacy and may lead to new or better solutions identified. Early dialogue and phased stakeholder engagement approaches mitigate unrealistic expectations, for example around financial benefits, and nurture community engagement. Commitment to human rights-based approaches and adaptive governance balances stakeholder needs, ensuring shared responsibility, trust and sustained outcomes that benefit both people and nature. Such participatory governance strives to balance community priorities and investor interests, enhancing community engagement, strengthening ecological outcomes, promoting project continuity beyond initial funding and bolstering local support while reducing investor risks over time.

EQUITABLE DISTRIBUTION

Addressing unequal risk and benefit distribution: The report advocates for strong social safeguards that ensure clearly defined responsibilities and transparent accountability mechanisms to protect IPs&LCs. Adopting a human rights-based approach ensures IPs&LCs are recognised as rights-holders, while duty-bearers, such as governments, investors and project developers, are obligated to fulfil these rights. Equitable benefit-sharing mechanisms are vital to balance financial returns with social equity, preventing elite capture and ensuring fair distribution of economic and social gains. Transparent fund allocation, participatory governance and collaboration with social justice organisations further strengthen trust and alignment between investors, developers and local communities.

POLICY AND REGULATION

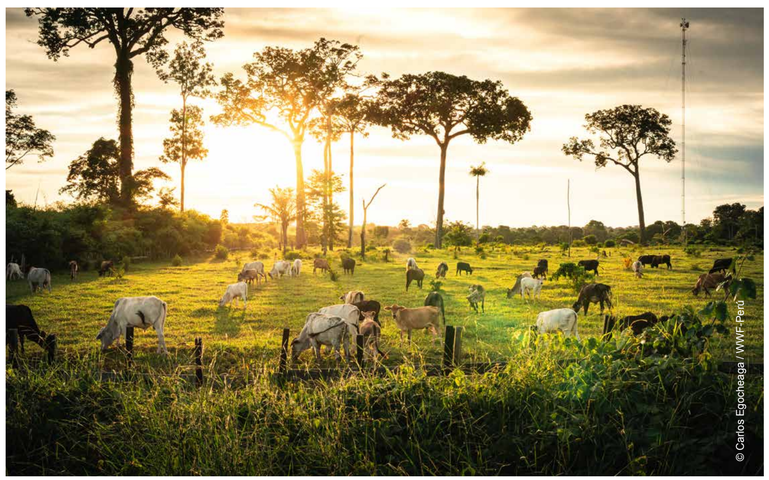
Establishing strong policy and regulatory frameworks: Blended finance models – combining public or philanthropic capital with private investment – can help bridge early-stage funding gaps to mature projects and deliver investor returns without compromising ecological or social integrity. Blended finance models can also strengthen safeguards and integrity in NbS projects by linking public and philanthropic funding to robust social and environmental standards. De-risking mechanisms, such as regulated compliance markets (for example: England's nature compliance markets), subsidies for monitoring and reporting and predictable frameworks like the UK landfill tax, enhance clarity around risks and returns.

Government and multilateral guarantees, such as those from the Green Climate Fund (GCF) and Global Environment Facility (GEF), stabilise cash flows and reduce risks, encouraging sustained private investment NbS initiatives. Additionally, mechanisms like the European Investment Bank's (EIB) Natural Capital Financing Facility (NCFF) can leverage mechanisms such as credit-sharing models to attract private capital to projects with long timelines or ecological uncertainties. Collaborative efforts are needed to combine technical guidance, funding and project incubation, further strengthening investor confidence and environmental outcomes. Finally, direct public financing of NbS can generate economic benefits, which combined with fiscal incentives such as ecosystem service levies, are important to send strong market signals affirming the value of nature, further enhancing scalability. Together, these measures attract private investment and support long-term biodiversity and climate goals.

MOVING FORWARD

Private finance for nature is needed and growing, with investment flows accelerating significantly in recent years. By mapping tensions, trade-offs and opportunities in NbS investment, this report provides practical insights for project developers, investors, standard setters and regulators to support the continued confidence and growth of market-based finance alongside public finance and enable it to achieve its potential impact. Some recommendations are actionable now, while others present a vision for the future role of private investment in NbS. Tailored guidance, developed collaboratively with stakeholders, will be essential to achieve effective, relevant outcomes.

A coordinated approach is crucial – no single group can drive this change alone. The report emphasises the need for shared understanding, innovative solutions, stronger governance and inclusive participation. With sustained, collective efforts, private finance for NbS can meet financial goals while upholding the ecological and social integrity needed to benefit both nature and communities.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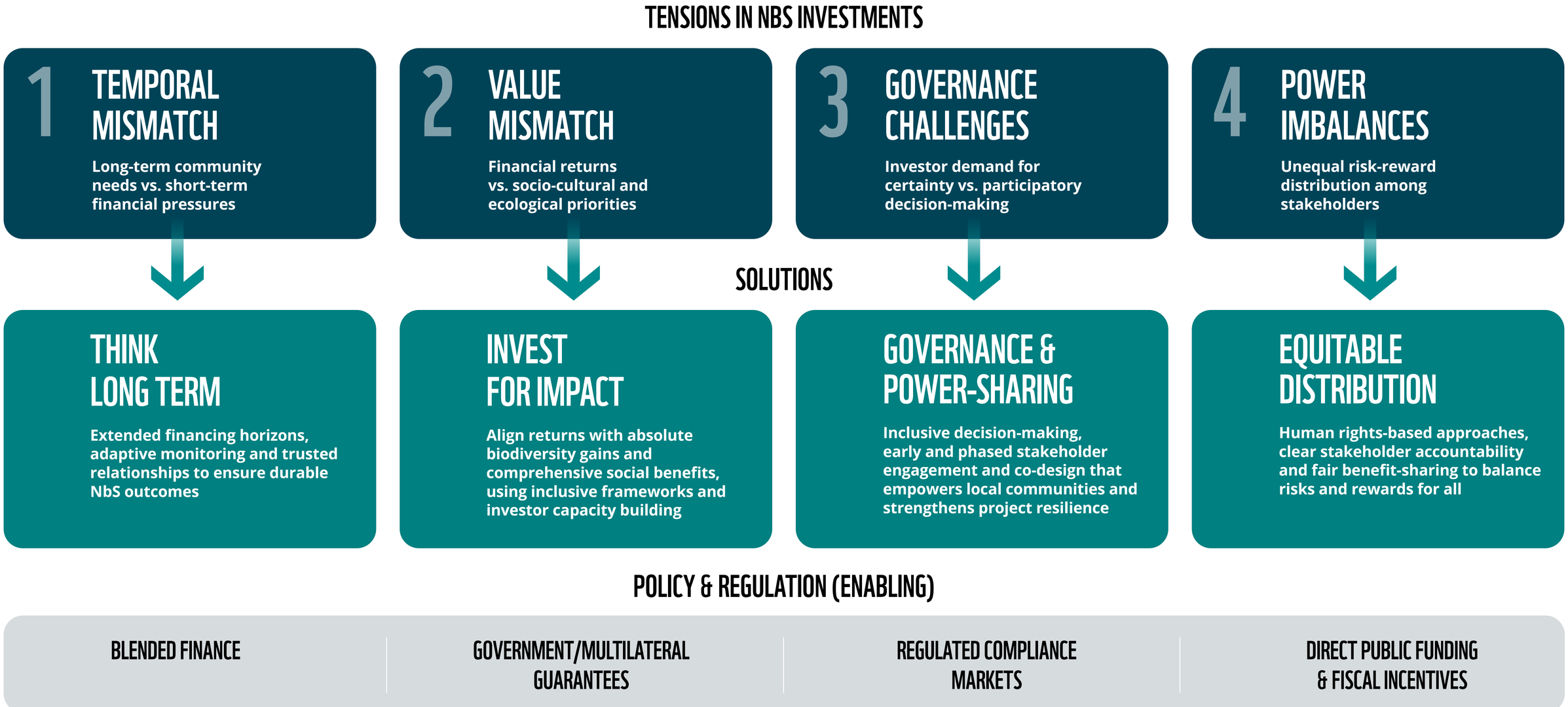


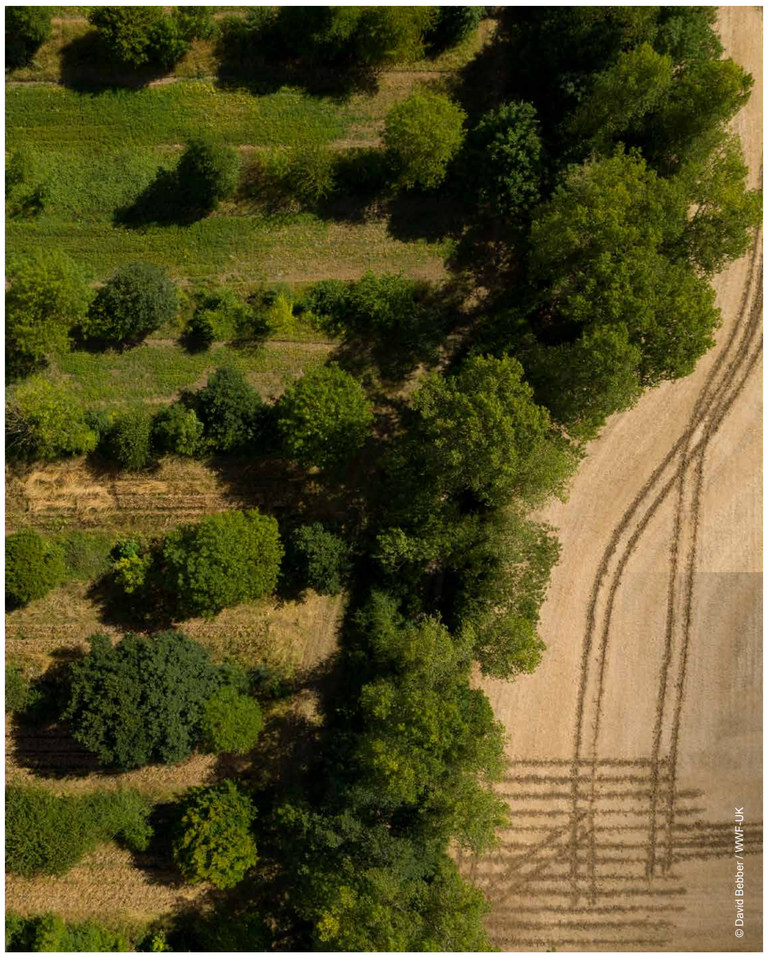
Figure 1.
The figure highlights four key tensions in nature-based solutions (NbS) investments - temporal mismatch, value mismatch, governance challenges and power imbalances - and presents four solution categories: long-term thinking, impact investment, governance and power-sharing and equitable distribution. Enabling policy mechanisms, such as blended finance, guarantees, compliance markets and public funding, support these solutions.

INTRODUCTION

Global biodiversity is in sharp decline, with monitored wildlife populations dropping by an average of 73% since 1970 [3]. Addressing this crisis requires an integrated approach to the "triple challenge" of climate change, biodiversity loss and human well-being, demanding urgent and coordinated action [4]. Key to this approach is closing the substantial funding gap for nature, redirecting investments from activities that harm biodiversity and ending the US$1.7 trillion in government subsidies that drive further loss globally [1, 5, 6].

As demand grows for private investment in nature conservation, it is essential these funds generate genuine ecological and social benefits while strengthening and not undermining, the rights of Indigenous peoples and local communities (IPs&LCs) [7-10]. Equitable investments must empower communities and foster wealth through nature protection rather than extraction. This approach is vital to achieving the Kunming-Montreal Global Biodiversity Framework's (KMGBF) goals of halting and reversing biodiversity loss and ensuring a sustainable and just future for all.

Nature-based solutions (NbS) provide a pathway to address these challenges by harnessing and supporting nature to deliver diverse benefits. To fulfil their potential, NbS must contribute to biodiversity goals, address climate impacts and deliver tangible benefits for local communities through inclusive governance [11]. Prioritising well-designed NbS that support biodiversity, protect community rights and address societal challenges is crucial to build resilient, long-term solutions.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BOX 1. NATURE-BASED SOLUTIONS (NbS)

Nature-based solutions (NbS)

As defined by UNEA, NbS are "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits" [12].
NbS offer key pathways to address global biodiversity targets while simultaneously tackling societal challenges, such as climate adaptation and disaster risk reduction.
This aligns with the Kunming-Montreal Framework's objectives, particularly Targets 14, 15, 16, 18 and 19, which focus on eliminating harmful subsidies, encouraging businesses to mitigate their impacts on nature and increasing investment in sustainable practices.

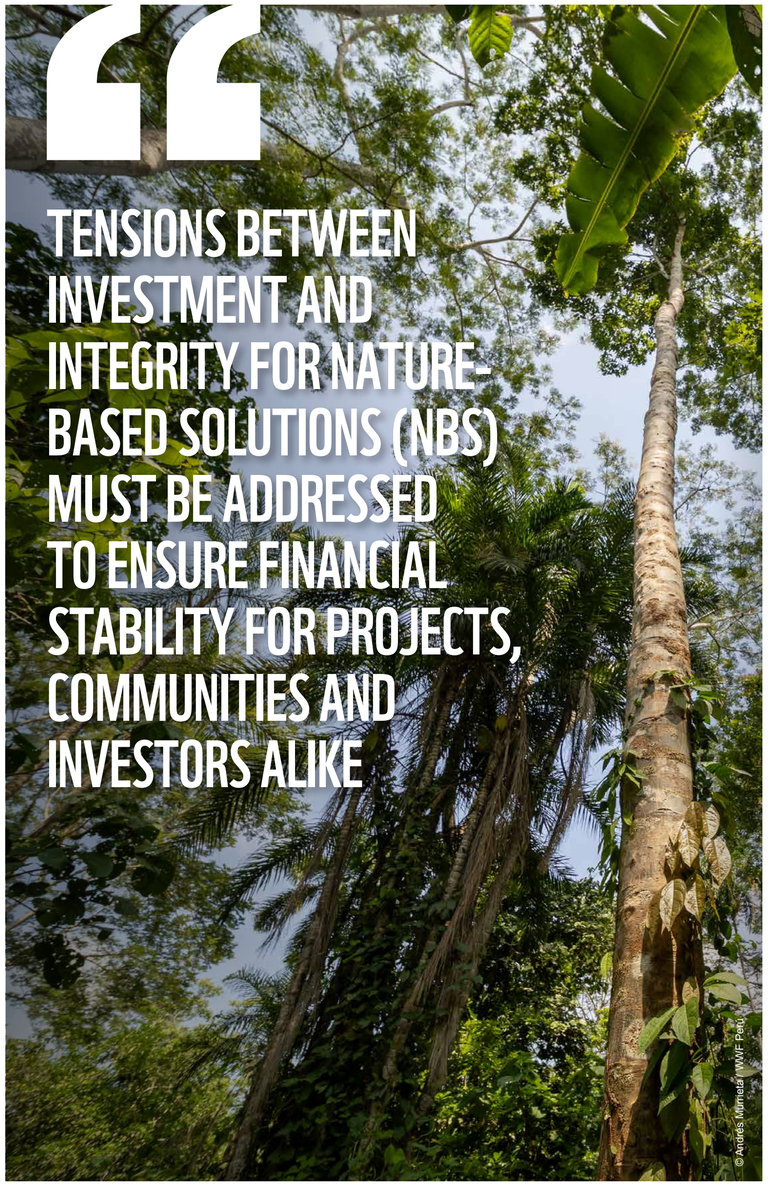
Although biodiversity is a public good, which should warrant more public funding [13,14], government investment in conservation remains insufficient [15,16], with an estimated funding gap of US$598–US$824 billion annually [5]. Therefore, in addition to increasing public funding, the vitally important KMGBF underscores the need to expand private investment in conservation through mechanisms such as blended finance, green bonds, biodiversity offsets and biodiversity or carbon credits (Target 19) [1,5] (for guides to different kinds of investment instruments, see [17-19]). Article 6 of the Paris Agreement also seeks to incentivise both public and private investment in nature-based solutions (NbS) to achieve climate outcomes through greenhouse gas mitigation. While private investment in nature has been, among other things, motivated by net-zero targets, supply chain risk mitigation and marketing goals, there is a growing policy focus on creating direct investment opportunities that generate cashflows from NbS [20,21] (see Table A1 in the Annex for an overview of policies and voluntary initiatives).

This report underscores the opportunities to scale private finance for NbS while advising on the better management of social and environmental risks associated with poorly designed NbS investments. While these risks are not unique to private financing and may also arise in philanthropic or public NbS funding, they are brought into starker relief because of tensions between investment and integrity for NbS. As flows labelled as 'nature finance' increase significantly, reported to grow elevenfold between 2020 – 2024 to over US$102 billion [2], acknowledging these tensions is crucial for mitigating investment risks, fulfilling reporting requirements and ensuring financial stability for projects, communities and investors alike.

Ecological risks include prioritisation of restoration over conservation of existing, intact high-biodiversity areas, lack of additionality, leakage and durability issues, while social risks involve human rights violations and social equity concerns, particularly regarding community displacement and the concentration of benefits among powerful actors [22]. Unaddressed, these risks threaten the very objectives of biodiversity protection and the societal challenges NbS aims to address, such as climate mitigation. The report also considers current risk management practices and safeguard implementation, such as for biodiversity and carbon credit mechanisms and sustainability certifications and the extent to which they manage the risks identified in the report. We find that weak governance, inadequate long-term monitoring and unreliable KPIs hinder effective risk mitigation, with many investments relying on weak proxies and self-reporting, leading to gaps in transparency and accountability.

These challenges are compounded by tensions between bankability and high-integrity NbS, where requirements for investor returns can conflict with the need to deliver lasting benefits for people and nature. NbS typically require extended timeframes to achieve meaningful ecological and social outcomes, which can extend beyond typical investment horizons. Short-term economic interests and financial incentives, such as the prioritisation of near-term returns on investment, contribute to trade-offs that undermine sustainability and drive biodiversity loss [23]. This jeopardises the long-term success of NbS initiatives [24].

To achieve the KMGBF, it is essential that more private and public finance are leveraged for high-integrity NbS. Those involved in designing, delivering or financing NbS benefit from embracing a solutions-oriented approach, which necessitates transparent identification and collective management of these tensions and associated risks. It is with this goal in mind that this report was written.



Finally, the report identifies strategies to address risks and tensions in NbS investments by enhancing transparency, strengthening governance and ensuring equitable participation. Key recommendations include implementing robust, long-term monitoring, adopting adaptive management practices and using blended finance models that help harmonise investor timelines with environmental and social outcomes. Specific actions for investors, project developers, regulators and standard setters are outlined, emphasising their responsibilities in fostering scientifically credible and socially equitable NbS investments.

This report serves as a resource for both NbS practitioners and investors, providing essential knowledge to promote high-integrity investments in NbS. By recognising these risks, stakeholders can make informed decisions about whether mechanisms, such as carbon credits or green bonds, can channel private finance toward NbS with integrity. The report underscores the need for collaborative and collective action to ensure NbS investments achieve financial goals while delivering lasting, sustainable benefits for both people and nature.

BOX 2. BANKABILITY AND HIGH-INTEGRITY NATURE-BASED SOLUTIONS

Bankability and high-integrity nature-based solutions.
Bankability is a project's ability to secure financing by demonstrating reliable income generation, risk management and transparent returns. Achieving bankability requires designing projects that attract private investors with measurable financial returns [25]. *High-integrity nature-based solutions (NbS)* strictly adhere to core principles ensuring ecological and social responsibility while benefiting nature and people. To meet these standards, high-integrity NbS must:

- **Address social and environmental challenges with long-term resilience**
  Effective NbS enhance societal well-being by supporting livelihoods, building resilience and addressing societal challenges such as climate change. They manage potential trade-offs, such as between protection and community displacement or production, which risk undermining ecological and social goals [11,26].
- **Deliver measurable biodiversity gains and maintain ecosystem integrity**
  High-integrity NbS must protect and enhance ecosystems, maintaining services like carbon storage, water regulation, or pollination. Projects should use evidence-based strategies to deliver measurable biodiversity gains and ecosystem health [11,26].
- **Engage and respect local communities and Indigenous peoples**
  Effective NbS uphold the rights, knowledge and priorities of local communities and Indigenous peoples through an inclusive approach. Projects must avoid infringing on community rights or disrupting traditional practices, fostering co-creation with consent and active participation [26,27].
- **Demonstrate economic viability**
  Effective NbS are economically viable, which requires assessing and documenting benefits and costs (tangible or intangible) across social groups, conducting cost-effectiveness studies, comparing with alternatives and considering diverse resourcing options for long-term sustainability.

  The IUCN Global Standard for NbS outlines eight criteria for implementing high-integrity NbS [28]. These include the need for NbS to address societal challenges *(Criterion 1)*, achieve net biodiversity gains *(Criterion 3)*, demonstrate economic viability *(Criterion 4)* and establish participatory governance *(Criterion 5)*. Adhering to these criteria promotes NbS initiatives that are impactful, equitable and sustainable.

METHODOLOGY

To examine the influence of private finance mechanisms on investments in NbS, we conducted interviews in June and July with 10 senior practitioners and one academic involved in:

- **Mobilising private finance to combat deforestation in oil palm landscapes.**
- **Developing international voluntary biodiversity credits.**
- **Supporting England's biodiversity net gain market.**
- **Creating carbon removal projects in east Africa and southeast Asia.**
- **Financing and advisory services for NbS.**
- **Representing IPs&LCs in the Global South.**
- **Managing wildlife conservation bonds.**
- **Overseeing nature-focused investment funds.**

Participants were selected through purposive sampling, targeting individuals in leadership positions across diverse financial instruments and regions, including Latin America, southeast Asia, east Africa, South Africa and Europe. We obtained verbal consent, ensured anonymity and agreed not to attribute direct quotes. Semi-structured interviews addressed:

- **Challenges in attracting private investment.**
- **Effects on social and ecological outcomes.**
- **Successful private financing of NbS projects and factors driving success.**

Interview notes were systematically examined using deductive thematic analysis, guided by existing research to identify key themes. This approach ensured that the analysis remained grounded in established knowledge while allowing for the recognition of emergent themes that arose from the data.

REVIEW OF ACADEMIC LITERATURE

The authors' expertise in biodiversity and carbon markets, conservation bonds, impact investing and community-led and rights-based approaches guided a review of academic literature, drawing on studies to synthesise insights and inform our analysis framework.

DOCUMENT ANALYSIS

We conducted a document analysis to assess social safeguards and community benefit-sharing practices, reviewing policies from eight biodiversity or carbon credit developers, seven certifiers and nine multilateral development institutions and intergovernmental bodies. This provided a snapshot of current standards in NbS projects (Table 1).

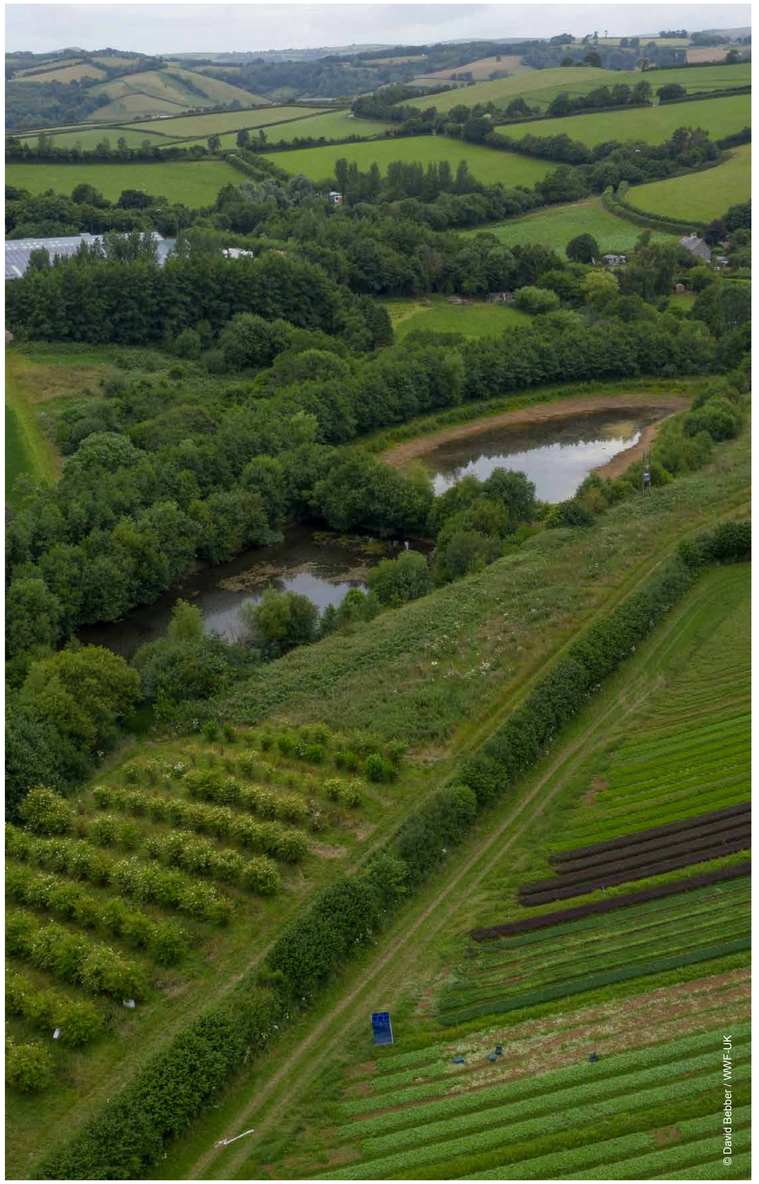


Table 1.
List of organisations, frameworks or guidance documents included in our review of social safeguards and benefit sharing guidance.

NbS stakeholders for review *(community benefits and/or safeguards)*	**Example companies/products**
Biodiversity & biocarbon project developers	• Savimbo • South Pole • Terrain Natural Resource Management • Value Nature • Carbon Tanzania • Koobi Carbon • Terros • Ekos
Biodiversity & biocarbon credit verifiers	• Climate, Community & Biodiversity (CCB) Standards by Verra • SD VISTA by Verra • Plan Vivo • Operation Wallacea • Eco-Markets Australia • Gold Standard • Accounting for Nature
Conservation impact bond	• Wildlife Conservation Bond (that is, Rhino Bond [59])
Multilateral institutions & other advisory groups	• Fund E&S management systems - BII Toolkit • Company E&S management systems - BII Toolkit • IFC Environmental and Social Management System (ESMS) • UNFCCC REDD+ safeguards • Global Alliance Demands • World Bank Social Safeguards • FAO, Framework for Environmental and Social Management, 2022 • UNEP's Environmental, Social and Sustainability Framework • 2010 Nagoya Protocol on Access to Genetic Resources

RISKS – SOCIAL AND ENVIRONMENTAL

OVERVIEW

This section examines the social and environmental risks that can arise in or be amplified by poorly designed private finance mechanisms in NbS (Table 2), highlighting potential impacts on biodiversity, community welfare and the long-term success of these projects.

Building on these, we then characterise tensions between delivering bankability and high-integrity NbS in the following section. In doing so, we clarify the challenges faced to inform the possible mechanisms that can deliver high-integrity, bankable NbS.

Table 2.
Environmental and social risks that can arise in or be amplified in private financing of nature-based solutions.
Note that these risks are not innate to private finance and can also affect poorly designed philanthropic or publicly funded NbS efforts.

Risk category	Risk type	Description
Environmental risks	Lack of additionality	When projects fail to sustain or deliver tangible benefits for biodiversity or climate, resulting in outcomes where gains (or avoided losses) would have occurred regardless of the investment, such as protecting an area that was not under threat.
	Leakage	When environmental harm is displaced to another location, negating the positive impact of the project.
	Lack of permanence	Where any gains achieved may be temporary or easily reversed due to factors like natural disturbances or changes in land use after financial support ceases.
	Greenwashing	A significant risk associated with failing to deliver genuine benefits for nature or climate. Greenwashing occurs when a project creates an illusion of success for reputational gain but fails to provide real environmental benefits.
Social risks	Human rights violations	These include actions such as the exclusion or displacement of communities from their lands, loss of access to resources essential for livelihoods and cultural practices and the continued appropriation of resources and marginalisation of people. Such violations disproportionately impact Indigenous peoples and local communities (IPs&LCs).
	Recognitional inequity	Where other perspectives and values - particularly those of IPs&LCs - are marginalised and their cultural viewpoints and knowledge systems overlooked or undervalued.
	Procedural inequity	This occurs when local communities are excluded from meaningful involvement in decision-making processes and ongoing monitoring, leading to a reduction in community autonomy and self-determination.
	Distributional inequity	This arises when investments disproportionately benefit more powerful individuals or groups within a community or across the network of actors, resulting in the majority receiving minimal or no gains.

ENVIRONMENTAL RISKS

Market-based mechanisms for NbS, such as carbon credits, can generate essential revenue streams when carefully designed in partnership with IPs&LCs. However, a significant challenge lies in the intangibility of many benefits – environmental (biodiversity, climate) and social (such as livelihoods, well-being) – unlike tangible commodities such as food or raw materials. Buyers of such intangible products like carbon credits or biodiversity offsets depend on the commodification process to assign market value through partial measurement of these benefits. This relies on the assumption that institutions and methods for quantifying benefits, such as for a tonne of carbon emission equivalents, are accurate. If these processes are flawed – such as using a biodiversity metric that poorly reflects actual biodiversity in the case of a biodiversity credit – the intended environmental benefit may not materialise, leaving buyers unaware. The value of intangible goods thus depends on the accuracy of their measurement. Unlike in ordinary markets, buyers cannot readily assess the quality of what they are purchasing.

Historically, flaws in commodification processes have led these market-based mechanisms to fall short of their environmental goals. Even if individual, privately financed projects succeed, it is the effectiveness of the overall system that is critical. For example, an evaluation of Victoria, Australia's biodiversity offset market revealed that 30% of avoided loss offsets improved biodiversity, 22% worsened it[i], and the majority had no impact, indicating limited overall biodiversity benefits[29]. Environmental risks of private NbS investment are particularly concerning because major markets, like biodiversity offset markets[1,5], are designed to compensate nature loss elsewhere[ii]. If investments funded through offset markets fail, they mask nature loss rather than prevent it. This issue extends beyond offsets to other mechanisms that channel private investment into NbS. Issues such as leakage further complicate matters: an investment might enhance biodiversity at one site but displace harm elsewhere, either geographically or within supply chains. For example, the success of sustainability certifications for agricultural commodities depends on their ability to ensure no harm to nature, highlighting the importance of effective mechanisms. Yet, a recent systematic review found that sustainability certifications or supply chain policies produced environmental or livelihood benefits in just over half of cases studied, with little to no impact on deforestation or biodiversity in many instances[30]. However, evidence from certain regions (South & southeast Asia and west and central Africa) remains limited and some studies demonstrate positive effects on biodiversity[iii].

SOCIAL RISKS

When effectively implemented, private investment in NbS can deliver vital funding for communities to conserve nature, particularly in areas where alternative land use options are destructive[32,33]. IPs&LCs and Afro-descendant peoples play a critical role in safeguarding biodiversity, collectively holding customary rights or managing at least 50% of the world's land, often highly biodiverse and overlapping with areas targeted for greenhouse gas (GHG) mitigation[34]. Their stewardship is widely recognised as a cost-effective and proven strategy for achieving conservation goals, with economic evidence supporting the benefits of securing community land tenure[35]. However, if affected communities are not central to these solutions, longstanding issues in conservation are likely to persist. Conservation has long grappled with tensions between excluding people to protect high-biodiversity areas and empowering local communities to manage land for mutual benefit[36-39]. Profit-driven NbS may incentivise powerful actors to undermine the rights and agency of those with alternative land management visions[40]. This risk is particularly acute where IPs&LCs hold customary rights to land and resources without legal recognition, jeopardising their rights both before and after private investment[41].

Poorly managed NbS investments risk perpetuating unethical patterns of exploitation, particularly in regions with weak governance and inadequate regulatory frameworks. Historically, the global economy has been characterised by 'ecologically unequal exchange', where wealthier Global North countries exploit natural resources, labour and materials from the Global South[42].

i. For 22% of cases in a comparison, controls (non-offset sites) outperformed avoided loss offsets in vegetation outcomes. These performed worse than comparison sites due to issues such as ineffective land management practices, or landowner self-selection bias, where land already at low risk of degradation was enrolled.

ii. This represents US$11.7 billion, annually, or a third of total private finance flows to NbS according to UNEP (2023).

iii. A recent study found that FSC-certified logging concessions in the Congo Basin supported higher mammal biodiversity, especially for large, endangered species, compared to non-FSC areas, which favour smaller species like rodents[31].

Although most private nature investments occur in the Global North (for example: wetland mitigation markets in the USA) [5], there is increasing pressure to expand NbS investment in the the Global South via mechanisms such as voluntary carbon markets, biodiversity credits, bonds, or debt-for-nature swaps. If these investments curtail local rights to produce 'commodities' for Global North consumption, they risk perpetuating historical exploitation patterns [43,44]. One notable example is Blue Carbon's acquisition of carbon offsetting rights across areas equivalent to 20% of Zimbabwe, 10% of Liberia, 8% of Tanzania, 10% of Zambia and an undisclosed region in Kenya, with little to no public disclosure or community consultation, raising serious concerns [45,46].

Failing to deliver socially equitable NbS presents significant risks. Evidence demonstrates that NbS which address inequities, rather than exacerbate them, deliver better long-term conservation outcomes [22,47]. This report's analysis maps onto three forms of social equity: procedural, distributional and recognitional (Box 3).

Benefit-sharing pertains to distributional equity, while participation and rights-based approaches address recognitional and procedural equity. Addressing social risks in private NbS investments is not only ethical but crucial for effective conservation and, ultimately, reducing investment risks. Investments should prioritise areas where they are genuinely welcomed by local communities and, where they are not, this preference should be respected and an alternative project location sought.

BOX 3. FORMS OF SOCIAL EQUITY IN NBS PROJECTS

- **Procedural equity** ensures transparent, effective and fair inclusion of local communities in the management and conservation of natural resources. It encompasses active participation in decision-making, implementation and problem-solving processes.
- **Distributional equity** concerns the fair allocation of benefits and burdens between different rightsholders and stakeholders.
- **Recognitional equity** means respecting and valuing the diverse perspectives, cultural beliefs, knowledge systems, legal and traditional rights, livelihoods and cosmologies of IPs&LCs [48]. It also recognises the unique needs and contributions of women and other under-represented groups.

REVIEWING CURRENT LIMITATIONS IN NATURE-BASED SOLUTIONS RISK MANAGEMENT

This section examines the current approaches to NbS risk management, focusing on gaps in existing tools and frameworks that can hinder effective outcomes for people and nature. Mechanisms currently in place to manage social and environmental risks are often inadequate, jeopardising the delivery of high-integrity NbS. We find several common limitations hindering the effective management of both social and environmental risks:

- **Short-term focus and inadequate long-term funding:** Financing mechanisms (notably biodiversity credits and some carbon credits) often suffer from front-loaded funding models that prioritise immediate financial returns, leaving insufficient resources for sustained management and monitoring over the long term (30 years or longer). This undermines the ability to achieve and maintain intended outcomes for both nature and people.
- **Defaulting to existing governance and legal systems:** The effectiveness of managing both social and environmental risks heavily relies on the robustness and integrity of national-level legal and administrative frameworks and their implementation by government officials on the ground. Inconsistent enforcement and weak governance (compounded by issues like lack of defined land rights or corruption) can compromise outcomes, making it difficult to ensure high standards for both environmental and social safeguards.
- **Issues with reporting, verification and accountability:** Both environmental and social risk management rely heavily on self-reporting by project developers, creating potential conflicts of interest. Market pressures can also drive developers to minimise costs, leading to reduced investments in robust monitoring and evaluation (M&E). This cost-cutting approach typically limits M&E to the bare minimum, preventing the establishment of counterfactuals (that is, what would have happened without the project) essential for accurately assessing project impact. Verification processes are often infrequent, with a lack of transparency and independent oversight, leading to the risk that failures or breaches in both environmental and social safeguards go unnoticed or unaddressed. These issues are compounded by the challenge of establishing globally consistent standardised methodologies to track and compare environmental impact data, reducing investor credibility and trust, as well as the bias towards ex-ante rather than post-hoc evaluation.

iv Note that efforts are under way to build consensus around a set of measurable state of nature (SoN) indicators and metrics, including from The Science Based Targets Network (SBTN) and the Nature Positive Initiative.

EVALUATING ENVIRONMENTAL IMPACT: CHALLENGES WITH PROXIES, KPIS AND CERTIFICATION IN PRIVATE FINANCE

Various mechanisms are employed to assess the environmental impact of investments in NbS, often varying by investment type. Environmental impact bonds, for example, typically rely on key performance indicators (KPIs). However, these evaluations often depend on proxies or standardised procedures, assuming compliance ensures environmental effectiveness. KPIs may fail to accurately capture biodiversity outcomes. Many existing KPIs – such as metrics based on area size or habitat restoration – serve as weak proxies, frequently overlooking the underlying drivers of biodiversity loss and lacking correlation with ecological health [49]. Area-based metrics, for example, may be easy to measure and report [50], but disregard complex ecological processes and interactions occurring within these areas [51].

This reliance on simplified metrics can inadvertently shift focus towards achieving easily measurable gains in areas of lower biodiversity value, rather than prioritising regions with high ecological importance, which may not immediately show 'gain metrics'. The risk is misallocation of resources, potentially neglecting the most valuable and vulnerable ecosystems.

To be effective, KPIs must function as robust indicators [iv] of biodiversity, representing complexity of ecological outcomes and ensuring that resources are directed to where they are most needed. These limitations in KPIs are also common in conventional conservation projects, where poor management can lead to a similar misalignment of resources and priorities.

However, when mechanisms such as bonds and credits are introduced to attract private finance at scale, these issues can be amplified. In this context, reliance on inadequate indicators compounds risks, as the drive to meet investment targets can inadvertently deepen resource misallocation and overlook biodiversity needs.

Assessment of environmental impact (for biodiversity, or climate) is also severely constrained by lack of appropriate baselines or counterfactual comparisons, largely due to data gaps, even in the UK or Europe, which have extensive biodiversity records [52]. This remains a key issue in validating impact on biodiversity in conservation [53]. For example, studies assessing the impact of protected areas (PAs) often lack appropriate baseline and counterfactual comparisons, which are essential for robust comparisons [54]. The lack of data requires expanding funds to establish baselines, which increases up-front costs for impact assessments. Without solid baseline data, it is hard to determine if a project is genuinely contributing to improvement or opening the door for market participants to exploit weak standards. Counterfactual scenarios cannot be directly observed, but reliable estimates are possible [55,56]. A common method compares the project site to similar areas without intervention funding to track differences in outcomes, helping to measure the project's unique impact ('additionality'). This requires quality public data on outcomes and influencing factors, which is achievable for some drivers of biodiversity loss (for example: deforestation) but more difficult for others (for example: rare species hunting).

Currently, ex-post assessments reveal mixed results regarding whether market-based mechanisms achieve their intended impact on climate or biodiversity. While philanthropic or publicly funded NbS efforts can fail for similar reasons [57], recent evidence suggests that, overall, outcomes are better than in the absence of conservation, although biodiversity declines are still observed [58]. In cases where private investments claim defined environmental outcomes but fail to deliver, there is a risk of creating an illusion of progress ('greenwashing'), which can have harmful societal impacts [59]. Below, we explore limitations in specific mechanisms used to channel finance to NbS.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ENVIRONMENTAL IMPACT OR CONSERVATION BONDS

These bond mechanisms are financial instruments that provide debt financing for projects theoretically linked to environmental improvements, with investors repaid through periodic coupons and the principal upon bond maturity. Recent analyses indicate that the KPIs used to assess environmental outcomes in these bonds are often premature, vague, simplistic or coarse [51].

- **Premature KPIs** focus on activities (for example: tree planting) or outputs (for example: restored area) rather than outcomes such as changes in biodiversity or forest carbon stock.
- **Simple KPIs** rely on broad measures like 'area conserved or restored,' or 'species population increase', failing to capture complex ecological processes [50,60].
- **Vague KPIs** use non-specific terms like 'benefit' or 'support', making outcomes difficult to measure or verify [61].
- **Coarse KPIs** depend on broad counterfactuals, such as national forest cover changes, rather than site-specific data.

These limitations, although not necessarily specific to bond mechanisms, illustrate a scientific disconnect between KPIs and actual environmental outcomes. This disconnect can result in overstating the environmental benefits of these instruments, potentially leading to unsubstantiated claims or exaggerated impacts [62]. While all biodiversity indicators are simplifications, evidence suggests that the majority of those currently used in environmental impact bonds need significant refinement [51].

CERTIFIED SUSTAINABLE COMMODITIES

Privately funded conservation efforts also face challenges when investments are made in certified sustainable commodities. Many investment funds marketed as 'nature' funds claim to support biodiversity by investing in agricultural commodities or forestry with sustainability certifications [63]. However, multiple evaluations reveal that such certifications often serve as imperfect indicators of biodiversity benefits [30, 64, 65]. These certifications largely do not include measures of environmental outcomes, focusing instead on procedural standards. As currently formulated, certification by itself is therefore often insufficient to reliably demonstrate that investments in nature are delivering positive outcomes.

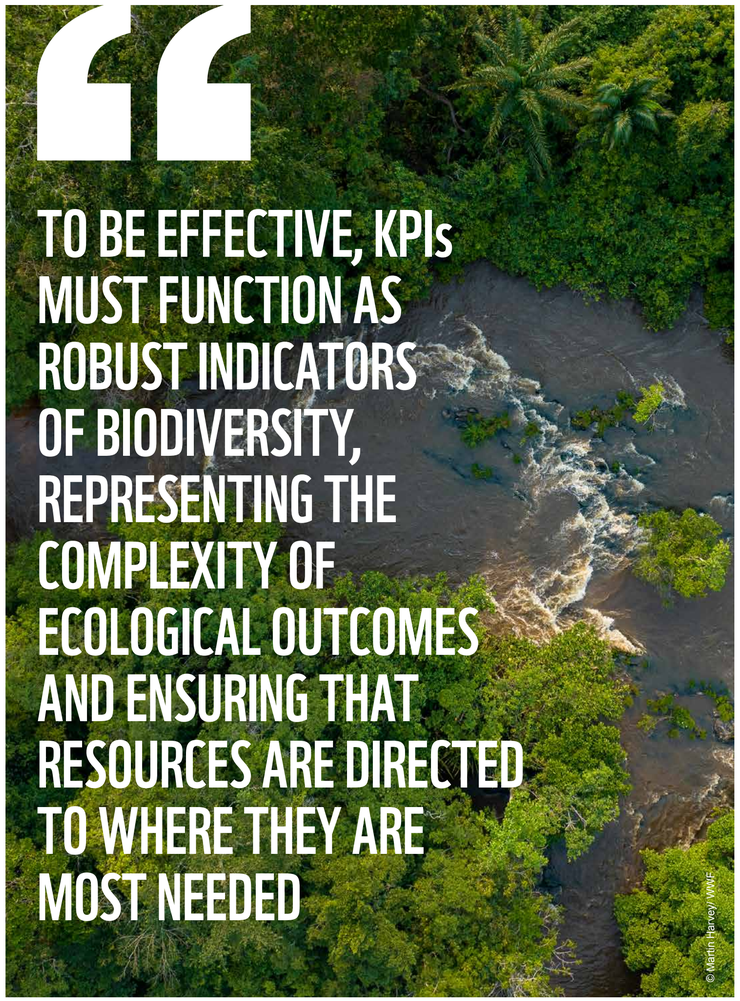
CARBON CREDITS

The voluntary carbon market (VCM) also faces significant limitations that undermine its climate impact (see Box 4 for a deep dive). Many projects have overestimated their climate impact, leading to the issuance of credits for actions that may not yield additional benefits (additionality), notably for avoided loss credits [66, 67]. The assumption of permanent carbon storage is problematic due to the potential for reversals (permanence) and buffer pools that often fail to fully compensate for these losses. Furthermore, emissions reductions in one area are frequently displaced elsewhere (leakage), diminishing the overall climate benefit. Despite these challenges, the VCM remains an important mechanism for attracting private finance into NbS. Efforts to promote the validity of carbon credits, such as through the work the Integrity Council for the Voluntary Carbon Market (ICVCM) is doing to establish rigorous standards and transparent governance, are essential to maintain investor confidence and achieve real climate and biodiversity outcomes. Carbon credit rating agencies can play an important role in ensuring the transparency and credibility of carbon credits. But ongoing efforts to standardise and refine their assessment frameworks are essential to boost investor confidence [68].

BIODIVERSITY OFFSETS AND CREDITS

In addition to limited data to assess impact and the challenges posed by the site-specific nature of biodiversity, the effectiveness of biodiversity offset and credit mechanisms [v] also face key limitations:

1. **Front-loaded revenue model:** Many biodiversity offset markets release the bulk of offset units early in the project lifecycle, often within the first few years (for example: the US wetland mitigation system releases most units within the first three years [69]). This creates pressure for immediate financial returns, which may not align with the long-term nature of ecological restoration or conservation management. These issues also affect nascent biodiversity credit mechanisms.
2. **Inadequate long-term funding:** The front-loaded model can in turn lead to insufficient financial support for ongoing management and monitoring, increasing the risk that projects will fail to maintain intended biodiversity outcomes as they progress, resulting in long-term compliance challenges. Projects supported by the NbS accelerator, attempting to harness the biodiversity net gain (BNG) market to finance land-use transitions in England, have noted this as a concern. This compounds gaps in technical capacity on the ground to support monitoring and evaluation, an essential element for ensuring market integrity and fostering growth.



v WWF distinguishes between biodiversity credits and biodiversity offsets based on their purpose and application. WWF defines biodiversity credits as certificates representing positive biodiversity outcomes from restoration, conservation or stewardship activities. Importantly, such credits are not used to offset residual negative impacts caused to biodiversity, but as part of a voluntary approach to contribute to and verify conservation efforts without compensating for specific biodiversity damage. WWF Position on Biodiversity Credits. October 2024.

BOX 4. LIMITATIONS OF CARBON CREDITS IN THE VOLUNTARY CARBON MARKET (VCM)

Carbon credits are a key tool in directing private finance towards nature-based solutions (NbS) via the Voluntary Carbon Market (VCM). Assessing their true climate impact is complex, hinging on additionality, permanence and leakage. Below, we examine these factors in detail.

Additionality: Additionality measures the additional carbon storage directly attributable to the investment. It is often assessed in binary terms (that is, whether the project would have occurred without carbon finance). However, this simplistic approach ignores critical nuances. For instance, a restoration project on marginal agricultural land might qualify as 'additional' but offer less impact than another on highly productive land. Binary evaluations can cause 'adverse selection', where landowners participate based on low opportunity costs rather than significant benefits [29]. REDD+ projects often issue excessive credits, highlighting over-crediting risks [66,67]. Selecting appropriate reference areas and periods for measuring habitat loss introduces further uncertainty, often resulting in credit overestimation. Another risk to additionality occurs where project developers sell the same credits to more than one buyer [70].

Permanence: NbS carbon storage can be reversed by events such as wildfires or disease outbreaks. Projects address these risks with buffer pools, withholding credits as insurance. However, evidence suggests these buffer pools are often inadequate and based on underestimated risk [71,72]. Additionally, long-term monitoring to verify durability is often absent, undermining carbon credit reliability.

Leakage: Leakage occurs when emissions shift outside project boundaries, reducing climate benefits. Despite the importance of accounting for leakage, many projects overlook it. For example, the UK's Woodland Carbon Code assumes zero leakage, while 59% of REDD+ projects reported no leakage at all [73,74]. When activities are displaced to other regions or globally, they can negate the additionality benefits of carbon credits [75,76].

Biodiversity benefits: Nature-based carbon credits are often marketed as having biodiversity co-benefits, but rigorous assessments are rare. Current standards, such as **VERRA's SDVista** and the **Climate, Community & Biodiversity (CCB) Standards**, measure biodiversity 'uplift' relative to baseline conditions but fail to account whether these changes would have occurred without the project.

These limitations show that while carbon credits are a key funding mechanism, their effectiveness in achieving climate and biodiversity goals can be compromised.

MANAGING SOCIAL RISKS: GAPS IN SAFEGUARD POLICIES AND INCONSISTENT IMPLEMENTATION

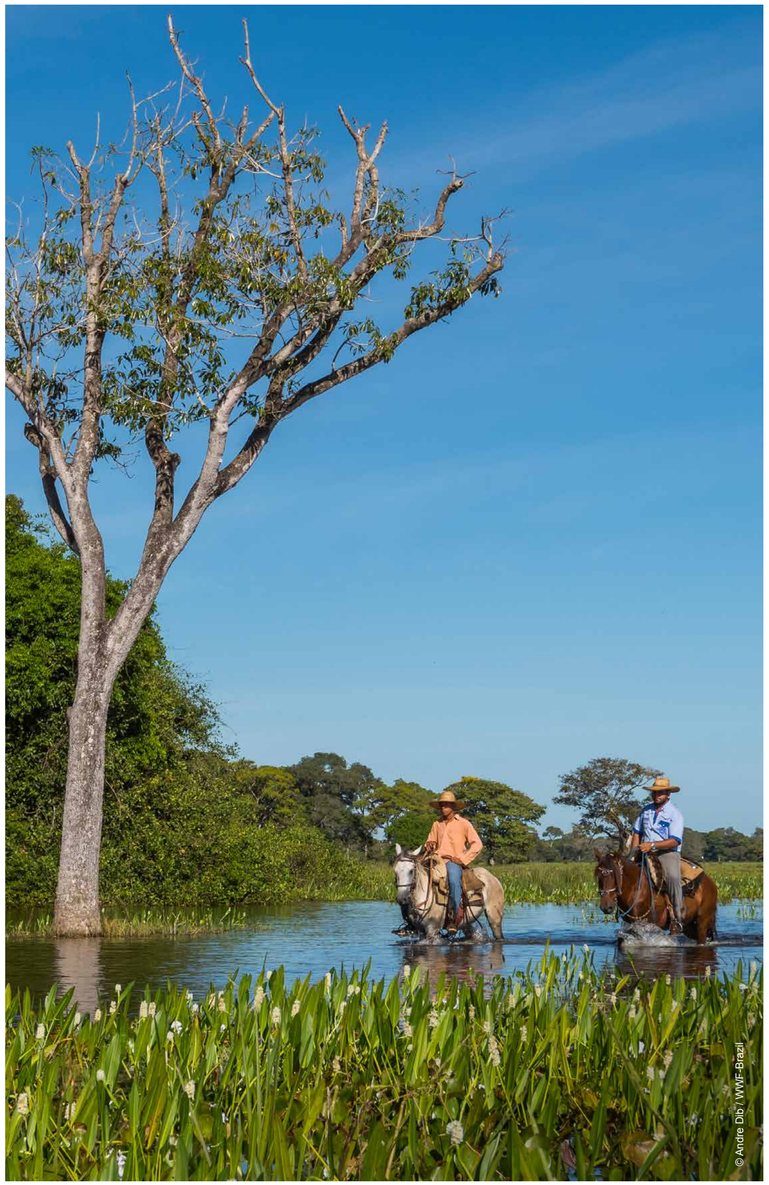
Mechanisms for managing social risks in NbS investments vary widely depending on the investment type. In national biodiversity compliance markets, social impacts are generally governed by national or state legislation aligned with environmental and social impact assessments. In international voluntary markets, social safeguards are typically promoted by standards developers or certifiers, often based on international human rights policies (see Table 1). Biodiversity-based commodity investments may be subject to finance industry standards, national laws, or multilateral development bank standards, such as the Equator Principles [77] and the International Finance Corporation (IFC) performance standards [78].

Our document analysis shows that community safeguards and benefit-sharing guidance are widely available, often referencing high-level documents like the United Nations Declaration on the Rights of Indigenous peoples. This declaration outlines legal obligations, including obligations to respect the rights of Indigenous peoples and some other groups to self-determination and to give or withhold Free Prior Informed Consent (FPIC). Best practices for benefit-sharing stress the need for distributional, procedural and recognitional equity, ensuring fair financial distribution, inclusive decision-making and addressing the barriers Indigenous peoples face [79]. Indigenous peoples should be active stakeholders in revenue-sharing agreements, not viewed as passive beneficiaries, although in practice this is challenged by existing systemic, structural, or institutional barriers that prevent the full participation of IPs&LCs. Project verifiers can suspend or revoke verification if contractual obligations are not met, with assessment criteria often informed by advisory groups guided by international, national and regional laws [80,81]. However, governance is largely dependent on the quality of local legal systems. For instance, in 2018, the World Bank revised its policies to align safeguard standards with national legislation, shifting from a centralised framework to one that incorporates the borrower's legal context [82]. This underscores that the governance of private investments is fundamentally tied to the integrity and effectiveness of local legal frameworks. In turn, while safeguards like FPIC and benefit-sharing mechanisms may exist on paper, they do not always translate into empowered participation (see Box 6).

Box 5 gives an overview of risks to adhering to safeguard and benefit-sharing standards for NbS during implementation. Strengthening safeguard guidance, reporting processes and governance standards is essential to reducing risks and enhancing social benefits in NbS projects.

Overall, while mechanisms do exist to assess and manage environmental and social risks in NbS investments, their effectiveness is often undermined by reliance on proxies, inconsistencies in safeguard implementation, limited resources to assess and adaptively manage potential risks and lack of practical safeguard implementation guidance.

Operational risks can also arise from a potential conflict of interest in reporting, as project developers are tasked with tracking their own outcomes for verification and verifiers may have commercial incentives that could compromise data integrity. Finally, a current lack of transparency in safeguard assessments limits the ability to measure success, identify issues and drive improvement. Given the dynamic nature of social risks, more frequent and trust-based communication between communities and oversight institutions is needed to promptly address potential breaches and ensure effective safeguarding.



BOX 5. COMMUNITY SAFEGUARDS AND BENEFIT SHARING: GAPS IN PRACTICAL IMPLEMENTATION

Guidelines for community safeguards and benefit sharing exist, but implementation is weak due to insufficient support structures. In our limited sample, 75% of developers relied on verifiers for guidance, while 85% of verifiers delegated this responsibility back to developers. This lack of clear ownership over safeguard responsibilities heightens risks, such as elite capture and the exclusion of marginalised groups from decision-making processes. For instance, an east African project developer independently developed guidelines at significant time and cost, underscoring inconsistencies across projects. Standardised, context-specific processes are essential for effective NbS implementation.

Benefit sharing and procedural equity

Land tenure requirements often restrict benefit sharing, excluding communities and individuals, particularly women, without formal rights. Some interviewees noted that long-term contract requirements prevent engagement with communities lacking secure land tenure. Furthermore, of the seven credit verifiers reviewed, only two require at least 60% revenue sharing with landowners or local stakeholders. Procedural equity - ensuring the inclusion of local community members, women and other marginalised groups in decision-making - also remains largely unaddressed. Procedural equity is essential to enable fair benefit distribution, while co-management frameworks could support joint planning and risk management. Fostering locally led projects strengthens long-term viability by embedding local ownership and knowledge.

Reporting conflicts and operational risks

While project developers monitor outcomes, verifier interests may compromise data integrity. Reports, often submitted annually or every five years, can fail to capture rapidly changing issues. Transparent ongoing communication, consultation and grievance frameworks between communities and independent institutions build trust, support adaptive management, enhance safeguard compliance and enable timely responses to emerging concerns.

Clarity in policy documentation

Ambiguous policy language blurs the line between discouraged but tolerated actions and strictly prohibited ones. For example, phrases like "Project interventions should avoid land purchase practices that do not follow best practice guidelines" [83] and "safeguards should be promoted and supported" [84] lack specificity. Verifiers can suspend or revoke verification for non-compliance, but social governance often depends on local legal systems. Implementing robust contracting standards in NbS projects could set expectations surpassing minimum national legal requirements, fostering stronger social governance.

BOX 6. DEMOCRACY IN NAME ONLY

Market-driven, science-focused approaches often frame community participation to achieve pre-determined measurable outcomes [85]. For example, a UK conservation charity frames community engagement as the final step in its 12 steps to rewilding, with the aim to "steadily win people over" [86]. While critical, engagement becomes problematic when reduced to isolated events aimed at building support for existing goals. This approach limits meaningful engagement, such as allowing communities to give or withhold consent or manage land and resources collectively.

Rather than addressing power imbalances and valuing diverse knowledge systems, participation can become a tool of control [87]. Market-driven NbS often prioritise measurable outcomes, leaving little room for the uncertainties and complexities of genuine participation. The appearance of democratic engagement often conceals power and equity issues in sustainability transformations, land use and resource management [85,88].

TENSIONS THAT ARISE FROM OR EXACERBATE RISKS IN NBS

This section examines tensions (summarised in Table 3 and Figure 1) between the need for financial returns and the goals of social and ecological integrity. This informs the strategies proposed in the following section 'Ensuring long-term success in nature-based solutions: key strategies for sustainable management'.

BANKABILITY X INTEGRITY: CONFLICTS BETWEEN INVESTOR DEMANDS AND SUSTAINABILITY

The evidence shows that return-seeking private investments in NbS can face various social and environmental risks. These are not inherent to return-seeking finance mechanisms but can be amplified under them. However, the importance of upscaling private finance for NbS remains firmly embedded in policy processes as a critical contributor to meeting global goals given the insufficient allocation of public finance towards nature recovery and NbS [1]. For projects to attract return-seeking finance, they must be bankable, with strong business models that reduce uncertainties, balance risk and return and deliver returns in the short to medium term, aligning with conventional investors' expectations.

The challenge is these criteria can clash with the need for strong social and ecological integrity, which must be carefully balanced. This section highlights the core tensions between bankability and high-integrity from a social and ecological perspective. We then explore potential ways forward, acknowledging that different stakeholders may have different views on the 'right' balance. These tensions illustrate the challenge in reconciling bankability with social and ecological integrity when scaling private investments in NbS, where power imbalances can lead to the prioritisation of the interests of capital owners or managers over project developers and local communities.

TEMPORAL MISMATCHES: BALANCING LONG-TERM COMMUNITY INTERESTS AND ENVIRONMENTAL MANAGEMENT WITH SHORT-TERM FINANCIAL PRESSURES

Developing viable NbS projects requires extensive preparatory work [52]. Tensions arise when long-term community engagement and stakeholder collaboration efforts, essential for social and biodiversity impact [28], conflict with investors' short-term return expectations. Interviews and the literature reveal a mismatch between the multi-year engagement needed for genuine community participation and the shorter-term timelines expected by investors.

While community and stakeholder engagement is vital for success, it is not always a prerequisite for bankability. However, projects that scale back engagement to meet investor timelines risk causing social harm, ultimately undermining the foundations of effective nature-based solutions (NbS). For-profit investors often seek short- to medium-term returns, but community-led mechanisms like FPIC can take years to establish and IPs&LCs retain the right to withdraw at any time. These mechanisms must be designed before project launch and maintained throughout its duration. Interviews indicate that it is challenging to find private investors or non-market funding sources willing to invest in these lengthy processes, which carry uncertainty, as communities may choose project designs that do not align with investor interests. Immature regulatory frameworks heighten this mismatch, complicating long-term planning and increasing uncertainty for investors. Without clear regulatory guidelines or regulated pricing mechanisms, investors may hesitate to commit to projects that require sustained engagement or extended timelines, as the absence of regulations affects risk assessments and investment appeal.

This mismatch often incentivises cutting corners, undermining social integrity, especially where local rights are overlooked. It also may favour projects where ongoing engagement already exists and institutions and trust are more established. Only projects with robust community engagement will deliver durable outcomes for biodiversity and human well-being in the long run, suggesting the system will eventually favour these projects.

Mismatches also occur between short-term bankability and long-term biodiversity management. Investors often seek medium-to short-term returns, while biodiversity impact requires long-term management and patient capitalisation. Discounted investment appraisals push projects to front-load benefits, often causing financial shortfalls and risks to operational costs.

For example, in the US wetland mitigation system, premature credit releases led to compliance failures [69,89]. In one interview, an example from a mangrove restoration project in east Africa illustrated a similar tension: community leaders resisted investor pressure to sell credits early, arguing that waiting for higher future prices would better support local livelihoods and long-term conservation goals. This is compounded by a lack of understanding of the interconnections between biodiversity, nature and long-term returns.

VALUE MISMATCHES: PRIORITISING FINANCIAL RETURNS OVER ENVIRONMENTAL AND SOCIO-CULTURAL BENEFITS IN NBS PROJECTS

When privately financed NbS projects prioritise revenues from biodiversity or carbon-related assets, they often adopt a narrow financial perspective, treating nature primarily as an economic asset. This contrasts with the well-documented intrinsic and relational values of many IPs&LCs, who view nature through cultural and ecological lenses [27,90,91]. This mismatch influences how objectives and benefits are prioritised in NbS projects [27,92]. The value mismatch, driven in part by profit-driven organisational norms, prioritises measurable outcomes – such as carbon sequestration or biodiversity uplifts – to align with investment structures and reporting requirements [93]. Quantifiable metrics meet investor needs but can sideline intangible social benefits like cultural preservation or community well-being, which are harder to quantify but equally important to local stakeholders [94].

This difference in priorities reflects how value systems, which guide institutional and organisational decision-making, influence what is tracked in NbS projects and which outcomes are considered valid. For example, many biodiversity credit schemes prioritise standardised metrics, often neglecting opportunities to integrate local or traditional ecological knowledge (LEK and TEK, respectively) [92].

The focus on easily quantifiable outcomes and simplistic proxies neglects the deeper complexities of ecological systems and the intangible social benefits central to community well-being. In the UK for example, while Natural England guidance recognises the importance of meaningful social engagement, public sector readiness to implement these practices remains limited. Rewilding organisations also face the challenge of embedding community engagement at the core of their decision-making processes [95]. This lack of engagement can be traced back to institutional biases that favour quantitative, verifiable outcomes, particularly in early project stages. These biases stem from the preference for metrics that align with investor priorities, marginalising the socio-cultural perspectives and local knowledge systems embedded in these communities [85,96].

When social aspects are included within market-oriented NbS frameworks, they are often treated similarly to ecological outcomes – requiring standardised, measurable metrics. For example, the Nature Finance Certification Alliance (NFCA) Community Benefits Standard aims to provide measurable social benefits, such as job creation or visitor numbers, because these are easier to track. While this approach helps attract finance, it risks reducing social benefits to narrow indicators that fail to capture the depth of human-nature relationships, which are deeply rooted in local communities' long histories of coexistence with nature [97].

Consequently, social benefits often become secondary to for-profit mandates or desire for measurable outcomes, treated as add-ons rather than integral to NbS projects. Market-driven approaches can marginalise alternative worldviews and Indigenous and local knowledges [26], obstructing transformative change in both human and ecological systems [24].

This mismatch of values affects how NbS projects are governed, whose knowledge is considered legitimate and which benefits are prioritised. While for investors nature is an asset to be commodified, IPs&LCs may see it as interconnected with their cultural and ecological well-being. Without more inclusive frameworks, the socio-cultural benefits vital to these communities will remain overlooked or sidelined in favour of financial returns [27,98,99].

TENSIONS BETWEEN PARTICIPATORY APPROACHES AND INVESTOR RISK AVERSION

Participatory approaches in NbS face tension between being seen as opportunities for innovation and as risks to investment outcomes. Risk-averse investors often perceive participatory approaches incorporating diverse perspectives as unpredictable, preferring more controlled, measurable outcomes [16,100]. This is similar to conservation approaches that leverage central authority in ways that dismiss local expertise [101]. The urgency of environmental crises sometimes leads to participation being viewed as a hindrance to swift action. Some calls have even been made to bypass it in emergencies [102].

This perspective risks over-relying on centralised governance and technical expertise, sidelining local communities and Indigenous peoples and their critical knowledge. Bypassing local participation for the sake of efficiency undermines project integrity and sustainability down the line [101], which in turn can, over time, affect the success of the project and financial returns.

NbS projects that prioritise centralised governance can exacerbate existing power imbalances and exclude underrepresented groups, including Indigenous peoples, women, youth and low-income communities. This exclusion compromises both the justice and long-term sustainability of these solutions [103]. For example, the Summit-to-Sea rewilding project in Wales faced initial resistance over neglecting local views [104] but gained support after adopting co-design principles [105]. Excessive focus on controlling uncertainty can create a ‘technical trap’, where scientific approaches overshadow local knowledge and lived experiences, sidelining communities in decision-making [22]. Additionally, failure to manage expectations from the outset can lead to disappointment or mistrust, particularly if community engagement raises hopes that are not fulfilled. Therefore, recognising these risks and implementing a nuanced, context-specific engagement strategy is essential for balancing participatory processes with investors’ expectations.

UNEQUAL RISK AND BENEFIT DISTRIBUTION BETWEEN NBS STAKEHOLDERS

Investors often view NbS as a high-risk, novel asset class due to limited precedents. Attracting mainstream investment requires delivering risk-adjusted returns comparable to other asset classes. For example, research analysing the investments of a specialised biodiversity-related private equity firm found that the average internal rate of return for private investments linked to biodiversity benefits was 14.7%[106]. However, practitioners questioned whether these returns were truly reflective of the risks borne by investors, especially given the burdens placed on project developers.

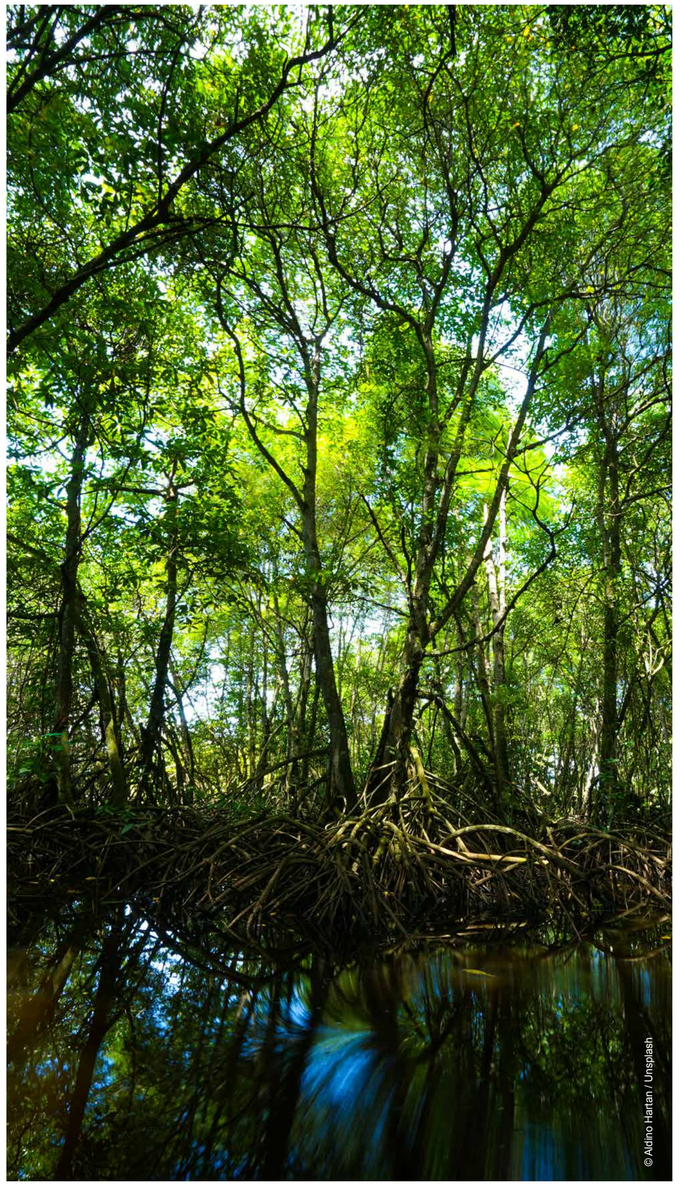
Interviews with practitioners highlighted that the distribution of costs and benefits across stakeholders involved in NbS is often unequal. Project developers, who along with IPs&LCs create much of the financial value in NbS projects, expressed concerns that they bore disproportionate risks while receiving limited rewards in attracting private finance. In contrast, capital owners and intermediaries, wielding greater economic power, captured a larger share of the benefits. This imbalance stems from investor behaviour and financial system incentives to meet benchmarks like hurdle rates which can limit returns for other stakeholders.

Consequently, developers reported that administrative burdens from buyers and funders – intended to reduce investor risk – externalised risks onto them and local communities. As a result, developers and local communities may bear disproportionate risks while receiving fewer benefits. This can compound inequitable benefit distribution, which may arise through locally mediated power imbalances, elite capture, corruption, or conflicts that can occur in any financial mechanisms. Financial mechanisms that do not appreciate how both external and local dynamics interact to generate these issues, can perpetuate or even worsen existing inequalities, particularly affecting marginalised groups such as Indigenous peoples, women and those with limited access to resources or decision-making power.

The tension lies in the need to attract capital by delivering high returns while ensuring more equitable benefit distribution. Investors often argue that high returns are necessary to compensate for uncertainties and potential failures, particularly in volatile and immature markets. Early entrants and pioneer investors often secure outsized returns due to their greater bargaining power, limited competition and the scarcity of alternative financing sources in the nascent NbS asset class. This dynamic exacerbates imbalances with practical consequences for both project developers and local communities, as administrative and logistical burdens from buyers and funders – designed to reduce investor risk – are often externalised onto them. Financially powerful actors, often from the Global North, may push to cut project costs, which can result in fewer local hires or reduced revenue-sharing agreements. For example, in one case in our interview sample, a multilateral development bank recommended reducing revenue-sharing with local communities to resolve financial issues in an NbS investment model. Such imbalances can deter developers from private NbS investments, hindering project scaling.

Table 3.
Tensions that arise from or exacerbate risks in NbS.

Tension category	Tension description	Example from interviewees
Temporal mismatch	Balancing long-term community engagement and biodiversity management with short-term financial pressures.	An interviewee described the challenges of establishing carbon credits in southeast Asia, noting it took 3–4 years of intensive community engagement to achieve 'investment readiness'. They faced significant difficulties as investors were unwilling to provide 'transition funding', leaving all the capacity-building efforts over those years unfunded.
Value mismatch	Conflicting values between investors prioritising measurable financial returns (for example: carbon credits) and local communities valuing diverse socio-cultural and ecological benefits.	A UK-based project developer admitted to minimal community engagement, considering it a 'nice-to-have' rather than an essential aspect, as it was seen as an unjustifiable drain on the project budget. Instead, they opted for desk-based ecosystem service modelling, bypassing direct interaction with local communities. Another interviewee involved in biodiversity credits in the UK shared an anecdote about investors avoiding discussions on 'natural heritage' because it was not measurable. This made it incompatible with their due diligence approach, which focused on clear, quantifiable metrics to justify investments.
Governance mismatch	Investor demand for certainty and control can clash with participatory approaches that involve complex, democratic decision-making, risking tokenistic participation or procedural shortcuts.	NbS practitioners noted tensions between the complexity of participatory approaches and the need for investment certainty. Community-led methods are seen as too slow, while private investment favours centralised control. Diverse partnerships in NbS governance, involving conflicting knowledge and priorities, are often deemed high-risk. This frequently leads to preference for centralised, 'expert'-led approaches, sidelining participatory models, alternative financing and local or Indigenous knowledge in favour of 'authoritative' expertise in natural capital and business.
Inequity	Unequal distribution of costs and benefits, with local project developers reporting bearing more risks and responsibilities, while capital owners capture disproportionate rewards.	One interviewee shared an anecdote about telling a senior decision-maker at a multilateral development bank that they were struggling to secure financing for their carbon credit project, partly because they aimed to ensure a 50:50 benefit-sharing arrangement with local communities. The decision-maker advised reducing the benefit-sharing ratio to make the project more attractive to investors.



ENSURING LONG-TERM SUCCESS IN NATURE-BASED SOLUTIONS: KEY STRATEGIES FOR SUSTAINABLE MANAGEMENT

A comprehensive understanding of the above tensions can help outline strategies for ensuring high-integrity nature-based solutions (NbS) balancing financial returns with ecological and social goals. The importance of striving for this balance is embedded in the IUCN NbS standard which includes eight core criteria to deliver successful and sustainable NbS that balance trade-offs equitably while striving for economic viability.

Adaptive decision-making processes are crucial for NbS to accommodate complex ecological and social dynamics, while also providing investors with the precision and accountability they seek. This approach includes ongoing monitoring, adaptive management and outcome-based financing. Nonetheless, challenges persist, such as managing the tension between long-term ecological needs and short-term financial pressures, reconciling financial and social returns and navigating governance complexities, which are critical to delivering NbS that are financially, socially and environmentally viable. This inevitably calls for changes in policy and regulatory mechanisms to foster the growth of private finance for NbS. We expand on this below. Figure 1 shows how the strategies proposed here relate to the tensions discussed in the previous section.

ADDRESSING TEMPORAL MISMATCHES: BALANCING LONG-TERM NEEDS WITH SHORT-TERM FINANCIAL PRESSURES

Enhanced and long-term monitoring and funding models: Ensuring sustained climate and biodiversity benefits in NbS requires addressing additionality, permanence and leakage through long-term commitments, compensatory measures and adaptive monitoring systems. Minimising leakage involves careful project design, such as improving yields on existing farmlands, to avoid shifting environmentally harmful activities elsewhere [107]. Continuous monitoring both on the ground (with context-specific indicators) and remotely (for example: satellite imagery), with adaptive management, is essential for long-term ecological impact [108]. Long-term funding mechanisms, spanning 10–15 years or even longer beyond the typical five-year fund horizons, are critical for sustaining the growth and success of NbS projects [109]. Mechanisms like contingency funds, staggered credit release schedules and ex-post credit issuance can tie funding to demonstrated success [55]. Additional durability can be achieved through long-term contracts, like conservation covenants, which strive to uphold project integrity and deliver resilient outcomes over time.

The Integrity Council for the Voluntary Carbon Market (ICVCM) requires that carbon credits include a durability guarantee of at least 40 years [110], ensuring that offset projects yield long-term environmental benefits. Further, methods now calculate equivalence between temporary and permanent outcomes using the social cost of carbon [71], making well-managed temporary outcomes valuable by guaranteeing that they deliver lasting value.

Leveraging established relationships for sustainable impact: Initiating NbS projects in communities with established long-term relationships can streamline implementation by building on existing trust and mutual understanding that not all initiatives may yield immediate results. Trusted intermediaries, such as Community Coordinating Organisations (CCOs), facilitate transparent communication and nurture trust. This builds accountability and helps balance investor demands with community needs, thereby creating resilience in NbS initiatives.

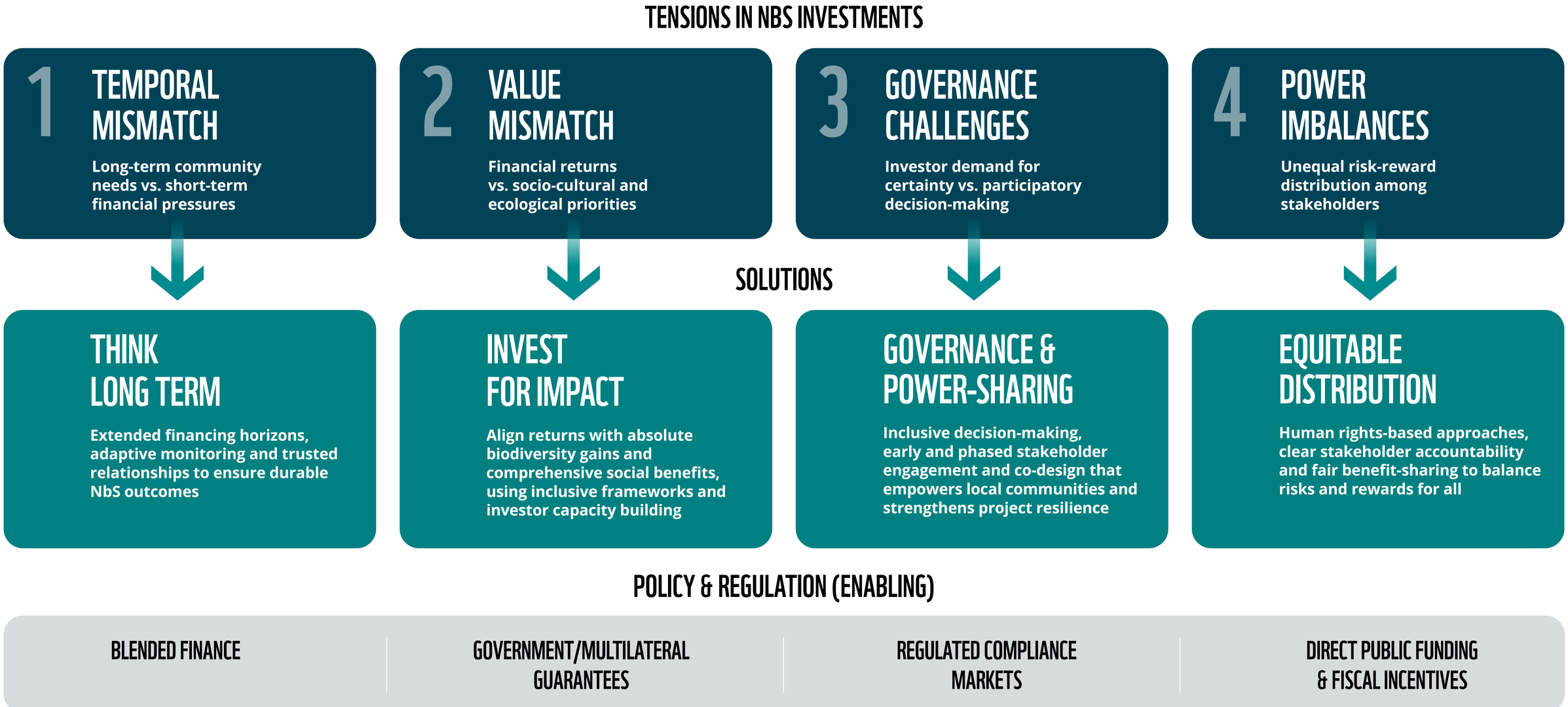


Figure 1.
The figure highlights four key tensions in nature-based solutions (NbS) investments - temporal mismatch, value mismatch, governance challenges and power imbalances - and presents four solution categories: long-term thinking, impact investment, governance and power-sharing and equitable distribution. Enabling policy mechanisms, such as blended finance, guarantees, compliance markets and public funding, support these solutions.

Blended finance approaches: Where long-term, trusted relationships are not established, combining public or philanthropic capital with private investment can help address temporal mismatches in early-stage NbS projects with limited commercial viability. Public or philanthropic capital, typically available for initial funding, supports the institutional and community engagement structures that are crucial in the early stages (and throughout the project lifecycle). This approach enables projects to mature to a level where private investment becomes feasible without compromising social or ecological integrity, as seen in models like project finance for permanence [111]. Efforts are needed, however, to overcome institutional disconnects challenging collaboration between public (DFIs/MDBs) and private finance institutions, which hamper blended finance deals [112].

ADDRESSING VALUE MISMATCHES: ALIGNING FINANCIAL RETURNS WITH ECOLOGICAL AND SOCIAL BENEFITS

Focusing on absolute biodiversity outcomes: Reframing key performance indicators (KPIs) from merely reducing biodiversity loss to securing existing biodiversity and actively enhancing it compared to a baseline or counterfactual is critical for NbS success. Emerging guidance, such as from the International Capital Markets Association, advocates for biodiversity gains that go beyond loss prevention, aligning investor priorities with enduring ecological outcomes [113]. Investments in nature should prioritise the protection of intact High Conservation Value (HCV) areas as part of the mitigation hierarchy. In high-biodiversity areas like Key Biodiversity Areas (KBAs) and National Biodiversity Strategy and Action Plan (NbSAP)-identified sites, targets should reflect absolute gains rather than damage control alone. Ongoing efforts [vi] aim to build consensus on measurable indicators and metrics to track biodiversity and nature recovery, bridging investor needs for measurable impacts with long-term ecological health. However, pursuing high additionality in ecologically degraded areas may conflict with existing land uses that have social or economic importance, such as food production. Without fair compensation or income alternatives, such projects risk creating social tensions [75] or leakage.

Embracing comprehensive gender and social impact: NbS must be designed to address broader, long-term effects on human well-being, moving beyond basic metrics like job creation or event attendance. Aligning NbS with the needs and perspectives of local communities, as emphasised by the IUCN NbS standard [28], can ensure sustainable social outcomes alongside ecological benefits. Social impact strategies should prioritise equitable benefit-sharing mechanisms and provide comprehensive assessments, such as on community well-being, cultural heritage and livelihoods. This approach is particularly crucial for projects involving IPs&LCs, as evidence shows their involvement often delivers biodiversity outcomes on par with protected areas [114,115].

Incorporating traditional and local knowledge: This supports project legitimacy and inclusive, culturally appropriate solutions that enhance biodiversity [92]. Frameworks like the WWF Environmental and Social Safeguards Framework (ESSF) (Box 9) and guidance from the HCV network offer practical tools for integrating these dimensions into NbS projects, capturing benefits beyond compliance, such as biodiversity health, cultural heritage and community well-being [116]. These comprehensive approaches can improve the inclusivity and accuracy of social impact monitoring.

Building financial sector capacity: Addressing value mismatches requires not only aligning financial returns with ecological and social benefits but also equipping financial stakeholders with the knowledge and tools to navigate the complexities of NbS. Systematic, tailored investor capacity-building initiatives can foster a more nuanced understanding of NbS benefits and associated values. Such efforts may include training on evaluating intangible social and ecological benefits, incorporating traditional and local knowledge and adopting inclusive frameworks for risk and return assessments. By building this capacity, the financial sector can move beyond narrow, quantifiable metrics and engage meaningfully with the multi-dimensional goals of high-integrity NbS.

vi The Science Based Targets Network (SBTN) and Taskforce for Nature-related Financial Disclosures (TNFD) provide guidance on state of nature (SoN) metrics and the Nature Positive Initiative released draft state of nature metrics. These include metrics such as ecosystem extent, condition, landscape intactness, species extinction risk, population abundance, natural habitat coverage and habitat functionality.

ADDRESSING GOVERNANCE MISMATCHES

Inclusive governance and power-sharing:
Nature-based solutions (NbS) with a strong emphasis on procedural equity achieve greater conservation effectiveness over time [22,47]. Meaningful engagement [vii] is vital in NbS design from the start, as the outcomes depend on people working collaboratively with nature [26,118]. A meta-analysis of 305 international case studies identified power delegation to local communities as the most reliable predictor of positive ecological outcomes [119]. Strengthening participatory processes minimises the risk of commodifying nature in ways that conflict with local socio-cultural values, aligning NbS initiatives with community priorities. The IPBES transformative change assessment provides robust evidence that pluralism and inclusion – acknowledging and honouring diverse voices – are essential for achieving transformative outcomes [24]. Insights from major climate funds, such as the Green Climate Fund and the Global Environment Facility, confirm that sustained impacts hinge on local community engagement, ensuring ownership and outcomes persist beyond project completion [120].

Mechanisms such as joint decision-making and conflict mediation processes empower communities to actively influence project outcomes [121]. For example, a 14-year collaboration between North American researchers and an Indigenous NGO in Papua New Guinea exemplified successful co-design [122]. The Summit-to-Sea rewilding project in Wales, despite initial setbacks from limited community engagement, successfully reshaped objectives through collaboration with local stakeholders [104,105].

Recently, the largest Indigenous-led Project Finance for Permanence (PFP) fund, 'Our Land for the Future', was launched. This US$375 million conservation agreement protects 380,000 square kilometres in Canada's Northwest Territories. Backed by federal, territorial and private funding, it empowers [22] Indigenous governments to lead stewardship, cultural revitalisation and economic diversification efforts, ensuring sovereignty in land management [123].

Incorporating diverse perspectives through co-design:
Local perspectives, particularly the TEK of Indigenous peoples, strengthen the design and resilience of NbS projects, improving financial stability. For example, the collaborative initiative in Papua New Guinea demonstrated that combining TEK with scientific methodologies produced more effective and enduring interventions [122]. Collaborating with IPs&LCs on monitoring also fosters project ownership and builds trust over time. For instance, the REDD+ Indígena Amazónico (RIA) enables Indigenous peoples to use TEK for monitoring (that is, where they utilise their deep understanding of local ecosystems to observe and document environmental changes), though limited political and market support has hindered its scalability [41]. This pluralistic governance ensures decision-making includes diverse voices, reducing the risk of commodifying nature and marginalising local perspectives.

Early and phased stakeholder engagement:
Early engagement with local communities, combined with transparent communication about project uncertainties and risks, fosters co-design while avoiding premature commitments and unrealistic expectations [124,125]. Respecting local governance systems during early involvement builds community investment in project outcomes. This approach strengthens long-term project sustainability and reduces investor risks. This aligns with WWF's Inclusive Conservation Guiding Principles [viii], which emphasise equitable participation, recognition of rights and socially just, sustainable conservation.

We find that embracing a phased approach helps align community and investors' expectations with the adaptive nature of NbS projects. Flexible, process-oriented investment strategies support adaptive governance, allowing projects to address changing conditions and stakeholder needs. This approach can help balance participatory complexity with investor demands for accountability and measurable outcomes.

Collective landscape action:
Finally, long-term approaches, such as nature-based insetting (see Box 7) and jurisdictional strategies (see Glossary), foster shared responsibility for collective action across landscapes and seascapes, building trust and reducing uncertainty for communities and investors. Although power imbalances pose challenges, human rights-based approaches [126] (see below) and inclusive governance uphold IPs&LCs' values, enhancing project legitimacy and promoting alignment with investor and community interests for mutual benefit to people and nature.

vii While there is no universally agreed definition of meaningful engagement, three critical elements are early and consistent engagement, two-way face-to-face interactions, over time and a deep understanding by external actors of local cultures and practices (adapted from [117])

viii. https://wwf.panda.org/discover/our_focus/governance/inclusive_conservation/

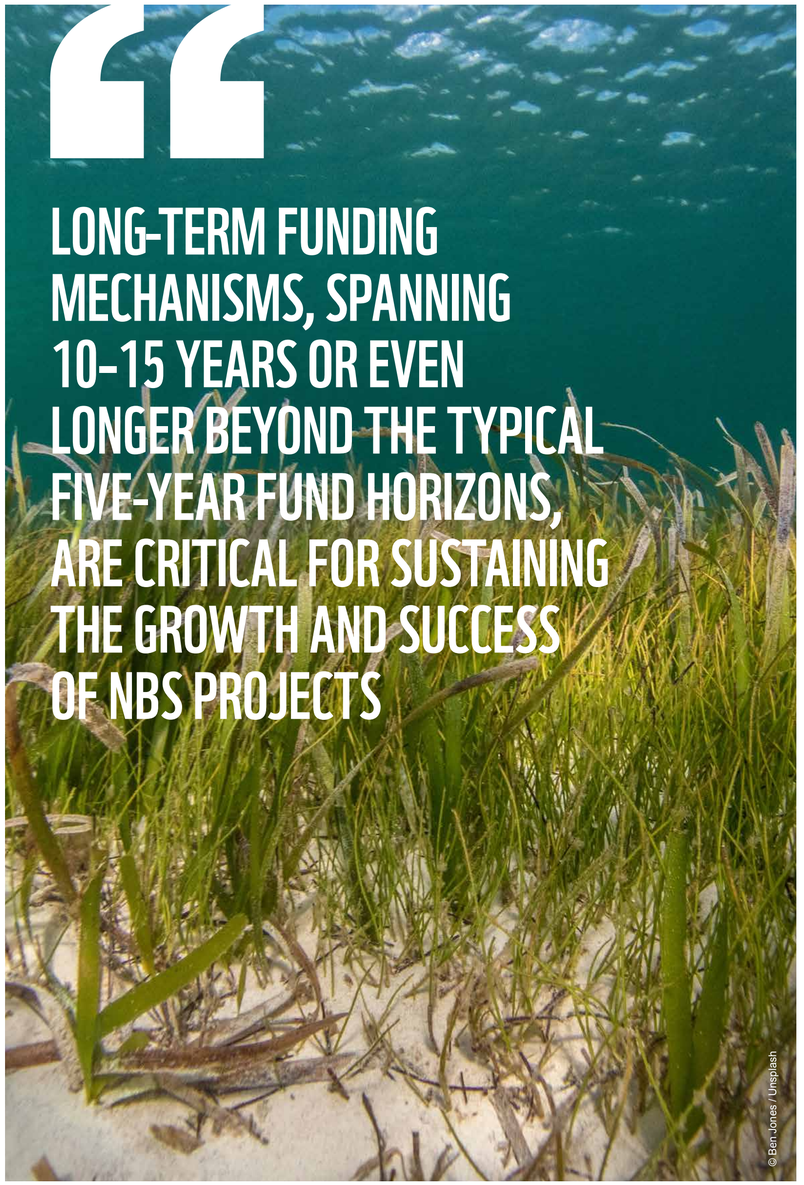
ADDRESSING UNEQUAL RISK AND BENEFIT DISTRIBUTION

Embracing a human rights-based approach:
Implementing explicit social safeguards with defined responsibilities is essential to protect the rights of IPs&LCs within NbS, uphold stakeholder accountability and mitigate material risks for investors. A human rights-based approach (Box 8) recognises IPs&LCs as rights-holders entitled to exercise their rights, while duty-bearers – including governments, companies, conservation organisations, investors and other institutions – are required to respect, protect and fulfil these rights [128] (see Box 9 for an overview of WWF's Environmental and Social Safeguards Framework, or ESSF). Clearly defining roles and responsibilities for all NbS stakeholders – including project developers, verifiers, financiers and buyers – is vital for implementing effective social safeguards.

Ensuring accountability across all stakeholders:
The WWF ESSF exemplifies the principles of a human rights-based approach by affirming IPs&LCs as rights-holders (whether customary, human or legal) and outlining duty-bearers' obligations, ensuring accountability throughout all project phases. In the absence of such clarity, larger actors – often secondary duty-bearers like buyers and intermediaries – may evade responsibility, shifting the burden of social risk management onto upstream participants, including project developers and IPs&LCs. Establishing transparent, well-defined roles ensures all stakeholders remain accountable, promoting consistent adherence to best practices. Although project developers manage on-the-ground responsibilities, other stakeholders – including verifiers and investors – must actively support these safeguards to prevent accountability gaps that undermine community protection efforts. Such measures are not only a moral imperative but also a prerequisite for successful NbS [26].

Balancing financial returns and social equity in benefit-sharing:
Achieving a sustainable balance between attracting investment and ensuring equitable benefit-sharing in NbS projects requires aligning the expectations of investors, developers and local communities. Transparent communication, shared goals and collaborative decision-making are essential for building this alignment. Recalibrating financial expectations to account for the risks and contributions of all stakeholders, especially the most vulnerable, fosters trust and enduring partnerships, ensuring financial viability and fair benefit distribution. Equitable benefit-sharing mechanisms are vital to ensure that local communities and project developers receive a fair share of the benefits generated by their contributions to NbS [129]. These mechanisms are designed to prevent elite capture, where powerful stakeholders disproportionately benefit at the expense of local actors. Economic benefits are however not necessarily the most needed or desired by local actors; in some cases, tenure security or capacity building may be more important. To be effective, benefit-sharing must be rooted in shared governance and participatory decision-making, enabling a fair distribution of economic and social gains among all parties. Addressing systemic inequities is critical to countering wealth concentration, which undermines equitable resource distribution and hampers efforts to reverse biodiversity loss [24].

Where local communities play a central role in investment efforts, interviewees emphasised that public accountability in fund allocation – particularly from NbS commodity sales – is crucial to preventing elite capture. Partnerships with social justice organisations reinforce these mechanisms by holding private financiers accountable and ensuring NbS project benefits align with social equity goals.



BOX 7. NATURE-BASED INSETTING

Nature-based Insetting [127] integrates nature-based solutions (NbS) within landscapes associated with corporate supply chains, enhancing production resilience while supporting biodiversity and community well-being. Effective insetting involves corporate actors taking accountability for the ecological and social impacts of their activities (for example: raw material procurement) by embedding ecological and social benefits into supply chains as part of their operational expenditures. By following the Mitigation Hierarchy (see Glossary) and addressing natural resource dependencies, insetting mitigates risks from resource scarcity, biodiversity loss and climate impacts. Insetting promotes long-term sustainability by integrating environmental, social and financial outcomes within a cohesive landscape framework.

Key benefits:

1. **Reduction of risks:** Insetting promotes risk reduction and strengthens supply chain resilience through targeted actions within supply chains.
2. **Reducing leakage:** Ecologically relevant landscape approaches that protect, restore or sustain biodiverse habitats while meeting production needs (relative to an appropriate counterfactual) help minimise the displacement of ecological impacts to surrounding areas.
3. **Enhanced governance and inclusivity:** High-integrity insetting requires strong collaboration among companies, local communities and stakeholders, fostering transparency and ensuring Indigenous peoples and Local Communities (IPs&LCs) play an essential role in decision-making.

Financing opportunities:

Nature-based insetting seeks to attract corporate investments directed at high-integrity, localised outcomes. Financial institutions can support these efforts through sustainability-linked loans and other funding models, leveraging private finance for sustained NbS projects and fostering closer partnerships with local stakeholders. For further details, refer to the WWF & Nature-Based Insights Report (2024) [124].

BOX 8. MINIMUM REQUIREMENTS FOR SECONDARY DUTY-BEARERS

Secondary duty-bearers - including companies and investors - are obligated to uphold human rights by adhering to a 'do no harm' approach across their operations. According to the United Nations Guiding Principles on Business and Human Rights (UNGPs) these entities must respect and actively promote human rights.

Key obligations under UNGPs

As per Principle 13, secondary duty-bearers must:

- Avoid causing or contributing to adverse human rights impacts.
- Address such impacts through grievance and remediation processes when they occur.
- Seek to prevent or mitigate human rights impacts linked to their business relationships.

In the realm of nature-based solutions (NbS), entities providing financing must ensure their activities do not, directly or indirectly, contribute to human rights violations. They are also expected to influence collaborators, including government bodies, to prevent human rights abuses in conservation efforts.

Human rights due diligence (HRDD)

In line with the UNGPs, secondary duty-bearers must establish an HRDD process to:

- Identify and assess human rights risks.
- Prevent and mitigate potential impacts.
- Report on how impacts are managed, including through remediation actions.

HRDD is often embedded in social safeguard frameworks to assess and address human rights risks. Essential to this process, Human Rights Impact Assessments (HRIAs) focus on adverse human rights impacts from the perspective of rights-holders and align with international human rights standards. Unlike HRDD, Human Rights Risk Assessments (HRRAs) focus on risks to the organisation itself, such as reputational damage and do not meet UNGP requirements for addressing risks to rights-holders.

Practical guidance on HRDD and HRIAs:

HRDD guidance

- *Stepping Up: Protecting Collective Land Rights Through Corporate Due Diligence* – Mei, L. & Perram, A. (2021), Forest Peoples Programme.
- *Respecting the rights of Indigenous peoples: A due diligence checklist for companies* – Danish Institute of Human Rights (DIHR), 2019.
- *OECD Due Diligence Guidance for Responsible Business Conduct* – Organisation of Economic Cooperation and Development (OECD), 2018.

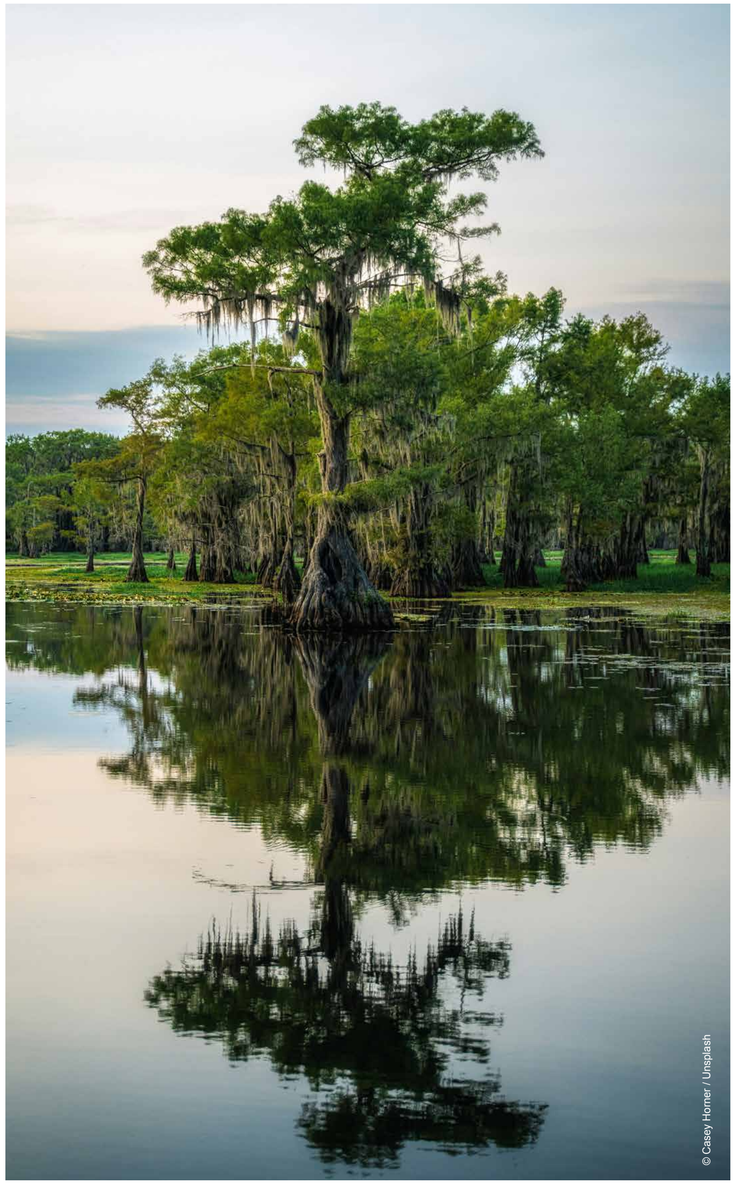
HRIA guidance

- *Human Rights Impact Assessment Guidance and Toolbox* – Danish Institute of Human Rights (DIHR), 2020.
- *Handbook on Human Rights Impact Assessment* – Nora Götzmann (Ed.) (2019), Edward Elgar Publishing.

BOX 9. WWF'S ENVIRONMENTAL AND SOCIAL SAFEGUARDS FRAMEWORK (ESSF)

The WWF Environmental and Social Safeguards Framework (ESSF) applies across WWF's global operations and addresses critical community safeguards and benefit-sharing practices, with a focus on IPs&LCs and ecosystems within landscapes. The ESSF mitigates social and environmental risks to IPs&LCs and biodiversity, reducing material risks for NbS implementers and financiers. The framework establishes specific safeguards in areas like Access Rights, Biodiversity and Natural Resources, Community Health, Safety & Security, Cultural Heritage, Grievance Mechanisms, Indigenous peoples, Pest Management and Stakeholder Engagement [127]. The ESSF clarifies and strengthens safeguards through structured risk identification, mitigation and monitoring, reducing misinterpretation risks. Key measures include mandatory risk screenings, tailored mitigation plans and regular monitoring and reporting. These processes ensure proactive management of risks, with specific attention to IPs&LCs and stakeholder engagement to support meaningful participation and accountability. Accredited safeguard experts and an independent ombudsperson's office enhance oversight and enforcement, reducing reliance on often inadequate local legal systems.

The ESSF's success relies on its adoption across all NbS investment and implementation steps. WWF enforces these standards rigorously in its projects, but encouraging voluntary adoption by others is challenging, particularly when financial incentives conflict with social and environmental commitments. Industry-wide adoption is crucial to maintain accountability and support high-integrity NbS. By choosing to align with frameworks like the ESSF, organisations can enhance their alignment with international best practices, fostering the scalability and impact of responsible NbS projects.



SHAPING AN ENABLING POLICY AND REGULATORY ENVIRONMENT TO FOSTER THE GROWTH OF PRIVATE FINANCE FOR NBS

Policies and regulations that promote blended finance, early-stage investment incentives, regulated compliance markets for natural capital and subsidies for monitoring, reporting and technical capacity building can help resolve these tensions and attract private finance to NbS [23]. Blended finance mechanisms, in addition to de-risking, can be strategically designed to bolster safeguards and high integrity in NbS projects by tying funding to robust social and environmental standards. Predictable frameworks, such as England's nature compliance markets [20] and the UK landfill tax, which funded environmental and community-benefiting projects [131], aim to deliver clear guidelines and pricing mechanisms to enhance sustainable financing and clarify risks associated with natural assets. The European Investment Bank (EIB), in its review of lessons from its Natural Capital Financing Facility (NCFF) (2015–21), emphasised the importance of compliance markets for ensuring credibility, pricing stability and scalability [52].

Beyond the UK and Europe, initiatives like Australia's Native Vegetation Framework (2002) established a biodiversity offset market in Victoria, while the 2003 Native Vegetation Act in New South Wales tied land clearing approvals to mandatory offsetting commitments. These policies offer structured compliance mechanisms and measurable metrics to incentivise private investment in biodiversity conservation. However, new regulatory measures must address the shortcomings of these policies, which have struggled to meet their objectives due to overestimated avoided losses and limited additionality [29,132].

Government and multilateral agency guarantees can enhance investor confidence by ensuring repayment and stabilising cash flows over extended periods [52]. For instance, the Green Climate Fund (GCF) assists developing countries in reducing greenhouse gas emissions and building climate resilience through concessional loans, guarantees and equity investments [133]. Expanding the GCF portfolio to explicitly cover large-scale NbS projects could increase its impact. The Global Environment Facility (GEF) has a track record of funding initiatives addressing biodiversity loss, climate resilience, and sustainable land management. By blending grants with concessional loans, the GEF mitigates investor risks while promoting financial sustainability [127]. Grants address upfront costs, while concessional loans support scalable growth. By accepting greater risk and lower return expectations, public finance can incentivise projects to prioritise long-term goals rather than immediate financial returns.

In Europe, the European Investment Bank's [ix] Natural Capital Financing Facility (NCFF) (2015 – 2021) combined loans and technical support for biodiversity and climate adaptation projects with measurable environmental and economic returns [48]. The NCFF's credit risk-sharing mechanism was designed to mitigate risks for private investors by absorbing potential losses, attracting capital to projects with long timelines, ecological uncertainties, or unproven revenue models. These initiatives can be incorporated into blended finance schemes to establish stakeholder-inclusive impact frameworks that prioritise social and cultural outcomes alongside investor-driven metrics.

Evidence from the NCFF and academic research highlights that public sector-led incentive schemes are crucial for unlocking value in nature and enabling scalable returns from investments in nature-based solutions (NbS). Compliance markets and policy mandates establish stable and predictable regulatory frameworks boosting investor confidence. In addition, fiscal policy tools – such as ecosystem service levies and taxes on environmentally harmful activities – alongside direct public investments, send a powerful market signal affirming nature's economic value [135]. Research also shows that public investments in NbS can yield significant economic and employment benefits, stimulating business-to-business expenditure – such as the procurement of materials, equipment and services for restoration activities – and producing substantial multiplier effects [136,137].

ix At COP16, The EIB and WWF signed a four-year agreement to promote nature-based solutions across Europe, focusing on ecosystem restoration in agriculture, energy, and urban resilience to enhance climate adaptation and biodiversity. WWF will establish an "Incubation Facility" to develop investment-ready projects, while the EIB will guide mobilising public and private funding. https://www.eib.org/en/press/all/2024-402-boost-for-climate-adaptation-in-europe-as-eib-and-wwf-join-forces-to-develop-nature-based-solutions-at-scale

CONCLUSION: A CALL TO ACTION

THE EVOLVING LANDSCAPE OF PRIVATE INVESTMENT IN NBS

Private investment in NbS is progressing, characterised by innovation and experimentation. This dynamic growth implies that not all solutions are readily apparent, underscoring the importance of continuous learning to refine best practices and build sector confidence. All stakeholders and rights-holders in NbS private financing must actively contribute to developing best practices, fostering innovation and creating a scalable framework that embeds social equity, justice and pluralism as foundations alongside environmental, social and financial objectives.

This report presents a range of practical insights for stakeholders interested in NbS investment. Some are immediately actionable, while others outline a long-term vision for private NbS investment. Insights most pertinent to specific stakeholder groups are highlighted to offer tailored guidance. Implementing these will necessitate further adaptation to specific actors and contexts, ensuring inclusive co-production among NbS stakeholders and embracing diverse perspectives. By thoroughly analysing key tensions, trade-offs and opportunities, this report lays the groundwork for refining tangible, targeted recommendations.

RECOGNISING CURRENT PROGRESS AND STANDARDS

Certain stakeholders, particularly standards-setters, are already implementing practices aligned with some of these recommendations. Highlighting these practices does not suggest their absence in the NbS financing ecosystem; instead, it emphasises their importance and promotes continued progress.

RISK AWARENESS AND INFORMED DECISION-MAKING FOR NBS PRACTITIONERS

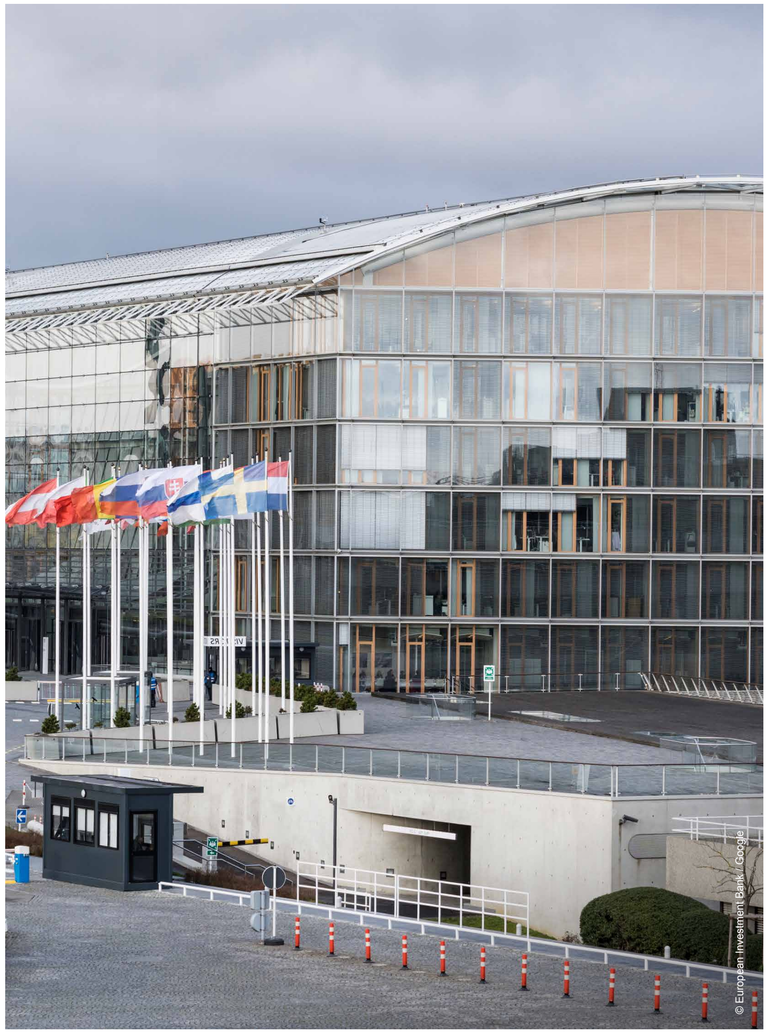
This report's analysis of risks, tensions and lessons is designed to equip NbS practitioners with the insights needed to assess and address risks in specific contexts.

A thorough understanding of these risks supports informed decision-making, which is crucial for assessing the suitability of mechanisms such as carbon finance in achieving sustainable outcomes. Equipping investors with this knowledge base strives to ensure investments align with NbS integrity.

ALIGNING PRIVATE FINANCE WITH BEST PRACTICES FOR NBS IMPACT

Recognising and addressing risks enables practitioners, intermediaries and investors to channel private finance into NbS, maximising environmental and social benefits. Complementing this report, WRI will soon release a guide for NbS investment, offering practical guidance for private finance institutions on how to incorporate NbS into long-term investment strategies.

This aims to ensure alignment of investments with impacts, helping to mitigate risks such as impact washing. Unlocking the full potential of NbS demands a coordinated approach, where private finance – guided by best practices and inclusive governance – scales to deliver meaningful returns and lasting benefits for people, nature and the climate.



REFLECTIONS

REFLECTIONS FOR INVESTORS

1. ECOLOGICAL AND SOCIAL RESPONSIBILITY

- **Recognise limitations of standards:**
  Understand that compliance does not guarantee the environmental or social success of NbS investments.
- **Prioritise social and environmental justice:**
  Recognise the importance of diverse strategies and forms of knowledge in NbS, including valuable IPs&LCs knowledge systems.
- **Verify legitimacy of IPs&LCs:**
  Where possible, confirm legitimacy of Indigenous-led or local projects directly with authorised representatives, avoiding intermediaries.
- **Monitor and evaluate social impact:**
  Integrate socio-economic indicators across levels, including board accountability, to strengthen social responsibility.

2. CLARITY AND ALIGNMENT IN INVESTMENT PLANNING

- **Specify use of proceeds:**
  Clarify the use of funds, avoiding listing broad unspecified options.
- **Align with environmental timeframes:**
  Strive to structure investment timelines to match ecological processes for sustained impact.

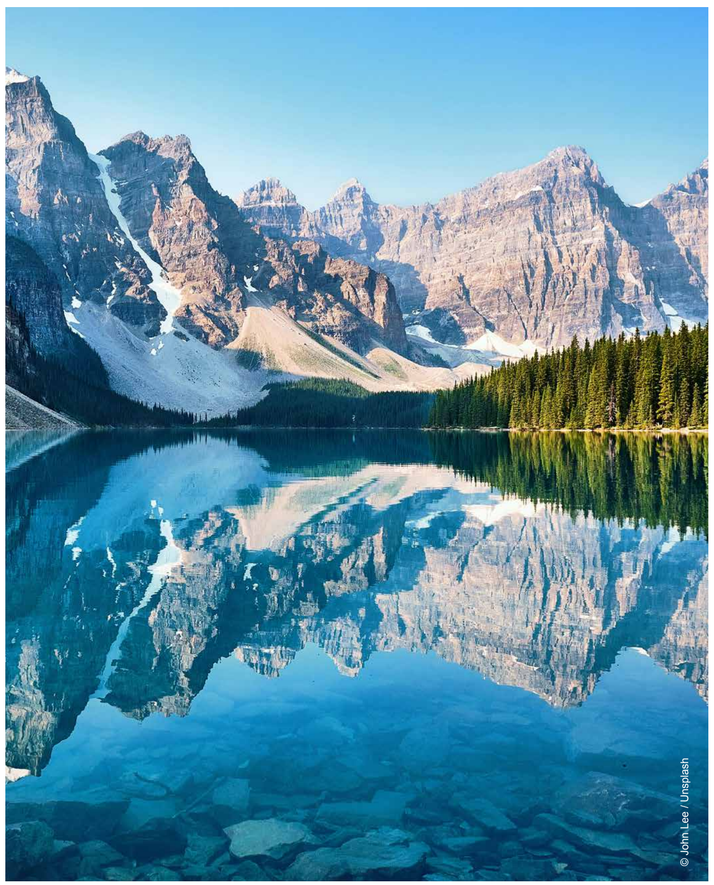
3. EMBRACING COMPLEXITY AND INNOVATION

- **Accept uncertainty:**
  Embrace diversity in views and priorities as opportunities for resilience and transformation, supporting community-led and rights-based participation which is key to stabilise projects over time by fostering local ownership and reducing long-term risks.
- **Support flexible, process-focused investment:**
  Support investments that allow flexibility and incorporate diverse perspectives, including local and Indigenous knowledge, to adjust to evolving socio-ecological and climatic conditions. Flexible investments lay the foundation for high-integrity, sustainable NbS projects that balance ecological, social and financial goals.
- **Reward transparent reporting on failures and successes:**
  Promote openness about both successes and challenges, contributing to sector learning, credibility and investor confidence. Failures can yield valuable insights, building collective knowledge.

REFLECTIONS FOR PROJECT DEVELOPERS

1. NBS DESIGN AND IMPLEMENTATION

- **Balance conservation and revenue goals:**
  Ensure the drive for revenue generation does not sideline the importance of focusing first and foremost on ecological and social integrity in NbS. This is fundamental to deliver effective, resilient solutions.
- **Link investment to outcomes:**
  Develop a theory of change that clearly connects investments to financial, social and ecological impacts.
- **Promote integrated approaches:**
  Diversify frameworks beyond market-driven NbS approaches by supporting more diverse multi-stakeholder strategies, adopting inclusive frameworks.
- **Collaborative partnerships for transformative change:**
  Foster landscape-level partnerships to share resources, build capacity and amplify collective NbS impacts.



2. MONITORING, REPORTING AND VERIFICATION (MRV)

- **Exceed MRV standards:**
  Adopt advanced monitoring and reporting practices, including KPIs that accurately capture social risks and benefits, and biodiversity gains and preservation needs. Guidance on designing effective KPIs is available, including public standards like IRIS+ [138] and the Green Bond Principles [139].
- **Ensure transparency:**
  Regularly disclose fund allocation, project progress and evaluation methods, incorporating spatial data for clarity on investment locations and impacts.
- **Define clear metrics and baselines:**
  Establish robust KPIs, counterfactuals and baselines to measure biodiversity, climate and social outcomes relative to no-intervention scenarios.
- **Prioritise relevant indicators:**
  Choose KPIs aligned with local social and ecological priorities, including KPIs that serve as robust surrogates for biodiversity. When unavailable, use intermediate indicators like socio-behavioural data for insights into long-term sustainable outcomes.

3. GENDER EQUALITY AND SOCIAL INCLUSION

- **Uphold human rights:**
  Adhere to international human rights standards, with special attention to IPs&LCs.
- **Secure land rights:**
  Support land tenure rights of IPs&LCs.
- **Implement rights-based approaches:**
  Collaborate with experts to support Indigenous communities in developing their own FPIC procedures and conduct thorough human rights impact assessments.
- **Tailor engagement and benefit-sharing:**
  Customise these processes to each context through phased and transparent engagement, ensuring FPIC (Free, Prior and Informed Consent) throughout the whole project lifespan and respect for community governance.

4. EQUITABLE GOVERNANCE AND POWER BALANCE

- **Promote community governance:**
  Support community-led governance and shared natural resource management to counteract power imbalances.
- **Encourage genuine participation:**
  Engage rights-holders and stakeholders early, with a focus on realistic expectation management and continuous, reflective governance. Ensure care to manage expectations around benefits and increase awareness of uncertainties and risks.
- **Support community-led NbS:**
  Involve local communities in co-developing locally relevant indicators and take a flexible, context-driven approach.
- **Balance urgency with inclusivity:**
  Avoid rushing ‘pace and scale’ at the expense of inclusivity; adopt adaptable approaches that integrate diverse perspectives for more resilient outcomes.

REFLECTIONS FOR STANDARD SETTERS

1. RIGOROUS AND ADAPTIVE NBS STANDARDS

- **Use robust ecological data:**
  Develop metrics inclusively, involving objective scientists, Indigenous peoples and local communities. Base evaluations on accurate and ground-truthed environmental data, relevant baselines and counterfactuals, with safeguards against conflicts of interest.
- **Enable adaptive pathways:**
  Support adaptive frameworks that balance the need for measurable outcomes with ecological and social complexity, enabling real-time learning, allowing NbS projects to respond effectively to environmental and social uncertainty while maintaining credibility and accountability in performance metrics.

2. HUMAN RIGHTS COMPLIANCE

- **Apply UN principles:**
  Follow the UN Guiding Principles for Business and Human Rights, with an emphasis on FPIC and self-determination for Indigenous and affected groups.
- **Act against human rights violations:**
  Avoid complicity in rights abuses and leverage influence to protect the rights of IPs&LCs.

REFLECTIONS FOR REGULATORS AND POLICY MAKERS

1. SUPPORT LONG-TERM COMMUNITY ENGAGEMENT

Recognise that effective NbS projects require time and involve uncertainties; non-return-seeking finance is essential for foundational community engagement.

2. STRENGTHEN NATIONAL LEGISLATION

Standards are often weakly enforced due to lack of enforcement capacity, with implementation typically defaulting to national legislation. Stronger national laws, appropriately applied, are crucial to achieving the social and environmental benefits of NbS. This could involve several areas of legislation including: environmental protection laws, community rights, social equity and land tenure laws, or sustainable finance and investment regulations.

3. ENABLE LARGE-SCALE INVESTMENT

Facilitate large-scale NbS investments through strong regulation, as voluntary actions alone will not achieve high-level conservation and climate objectives necessary for achievement of NbSAPs and NDCs. Strong policy support and incentives are needed to attract large-scale capital, including private sector compliance obligations tied to regulatory investments.

4. DE-RISK PRIVATE INVESTMENTS

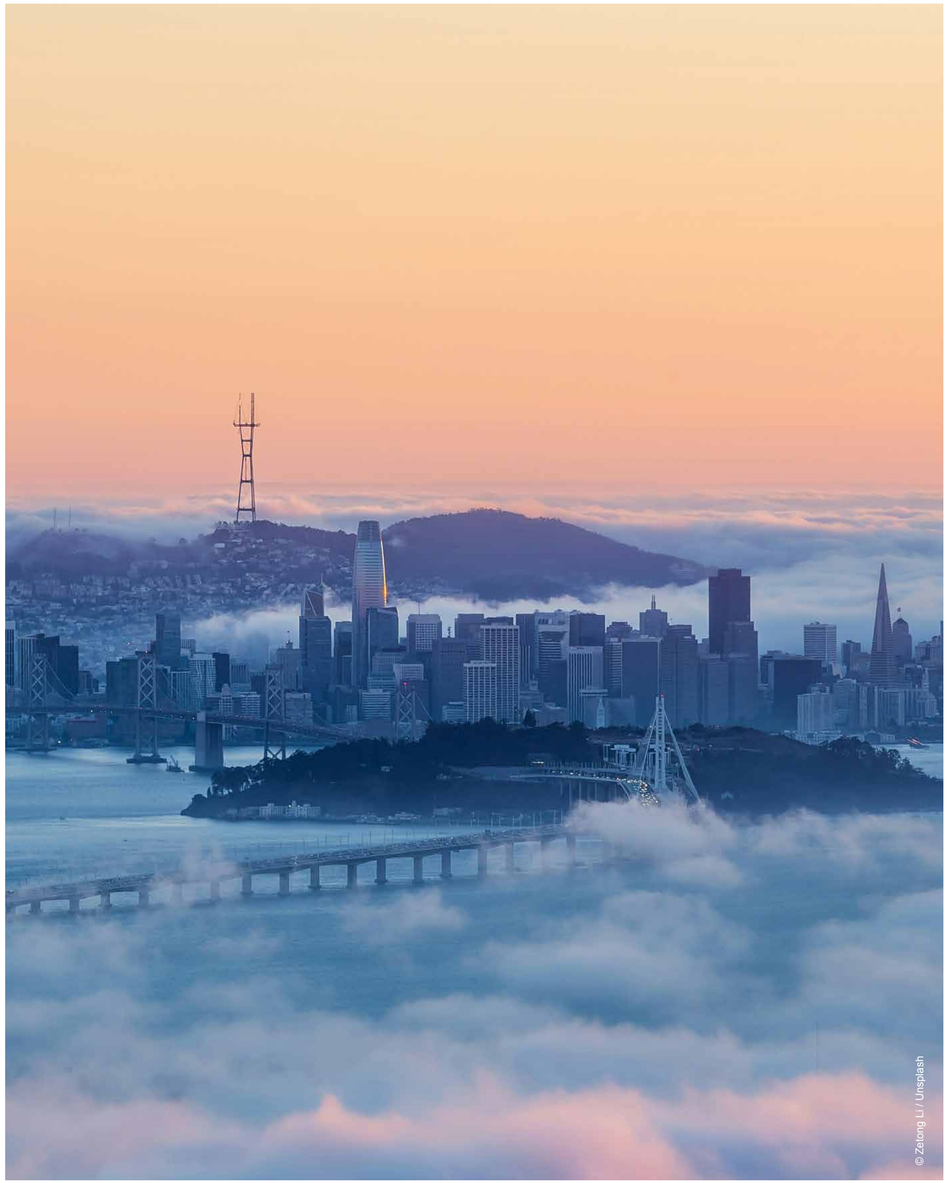
Implement measures such as blended finance models that combine public or philanthropic capital with private investment, early-stage funding incentives and financial guarantees. These mechanisms can bridge funding gaps, stabilise cash flows and encourage sustained private financing in high-integrity NbS initiatives.

5. SUBSIDISE MONITORING AND REPORTING COSTS

Offer financial support for monitoring and reporting in NbS projects, enabling more accurate measurement of outcomes and wider dissemination of findings and data, thereby increasing investor confidence in project integrity.

6. PROMOTE INNOVATIVE FINANCING MECHANISMS

Support credit risk-sharing mechanisms, such as those offered by the European Investment Bank's Natural Capital Financing Facility (NCFF), to attract private capital to NbS projects with long timelines, ecological uncertainties, or unproven revenue models.



ANNEX

Table A1.
Examples of high-level policies and voluntary initiatives aiming to scale up private investment in conservation to address global biodiversity funding gaps (adapted from [100]).

Policy or initiative	Target initiative	Driver of private investment
Paris Agreement	All national signatories of the UNFCCC	Target 6.4 aims to create an architecture to enable countries or private institutions to purchase emissions reductions from other countries, partly to incentive private investment into nature-based carbon offsets.
Kunming-Montreal post-2020 Global Biodiversity Framework	All national signatories of the CBD	Target 19 explicitly calls for "Significantly increasing domestic resource mobilization, facilitated by the preparation and implementation of national biodiversity finance plans or similar instruments according to national needs, priorities and circumstances… Leveraging private finance, promoting blended finance, implementing strategies for raising new and additional resources and encouraging the private sector to invest in biodiversity, including through impact funds and other instruments… Stimulating innovative schemes such as payment for ecosystem services, green bonds, biodiversity offsets and credits…" Targets 14, 15 and 18 all also mention scaling up incentives and aligning fiscal flows with overall biodiversity goals.
Sustainable development goals	UN Member States	Targets 15.a and 15.b call for "Mobiliz[ing] and significantly increas[ing] financial resources from all sources" to conserve ecosystems and forests.
Asia-Pacific Green Deal for business	Asia-Pacific Countries	Under the Green Finance pillar, it calls for "mobilizing public and private finance for green transformation" to direct investments toward sustainable energy, infrastructure and biodiversity conservation.
Amazon Cooperation Treaty Organization (ACTO) Strategic Agenda	Amazon Basin Countries	In the Strategic Agenda on Sustainable Development, it emphasises "public-private partnerships for biodiversity conservation", particularly focusing on private investments for sustainable forestry and ecosystem services.
ECLAC's Regional Agenda for Sustainable Development	Latin America and Caribbean Countries	This agenda promotes "mobilizing financial resources, including private finance, for sustainable development", with a focus on biodiversity conservation and sustainable land use.

Taskforce for nature-related financial disclosure (TNFD)	Businesses	Organisations are encouraged to report on their nature-related opportunities. These include "Amount of capital expenditure, financing or investment deployed towards nature-related opportunities, by type of opportunity, with reference to a government or regulator green investment taxonomy or third-party industry or NGO taxonomy, where relevant… Increase and proportion of revenue from products and services producing demonstrable positive impacts on nature with a description of impacts." Core metrics for organisations reporting information aligned with the TNFD [140] include their total spatial footprint, including their "total rehabilitated/restored area" and their change in extent, as well as indicators of the state of nature within which the company operates (using a flexible set of contextually appropriate indicators).
EU biodiversity strategy for 2030	EU Member States	Section 3.3.2. highlights the desire to upscale private investment – that at least €10 billion will be mobilised through blended finance via the InvestEU initiative. It promotes the role of the EU taxonomy aiming to provide "long-term certainty for investors and help embed sustainability in the financial system." Advocates for changes to tax and pricing systems to reflect "user pays" and "polluter pays" and advocates for the use of state procurement to drive demand for companies and products that deliver nature-based solutions.
Nature restoration law	EU Member States	Member states will be asked to include estimates of financing needs and the means of intended financing, including private finance, in their national restoration plans and report on the implementation every three years.
New EU forest strategy for 2030	EU Member States	Section 3.4. covers financial incentives for forest owners to improve the quantity and quality of EU forests. Strategy advocates for increasing subsidies for more ecological forms of forest management, as well as upscaling carbon farming initiatives "through the generation of carbon certificates that can be traded in markets". Highlight that the EU Commission is developing a regulatory framework for certifying carbon removals.
Corporate Sustainability Reporting Directive (CSRD)	Large businesses with operations in the EU	Disclosure requirement E4-1. Organisations will be asked to disclose a description of the resilience of their strategy and business model in relation to biodiversity and ecosystems. This includes potentially disclosing a transition plan demonstrating how their business model will be adjusted to be compatible with the EU biodiversity strategy or the Kunming-Montreal Global Biodiversity Framework. Requirement E4-3 requires they disclose their biodiversity and ecosystems-related actions, including resources devoted to these actions.
Carbon Removals and Carbon Farming Certification (CRCF) Regulation	EU Member States	Regulation aiming to "improve the EU's capacity to quantify, monitor and verify the authenticity of … carbon removals. It sets out rules to recognise certification schemes…" The Commission highlights that "certified carbon removals can be the basis of new economic opportunities and can be monetised through private schemes and public sector support, as well as generating commercial advantages with consumers looking to reward environmentally friendly practices. Carbon farming will create new business models for farmers and foresters and is expected to yield significant benefits for biodiversity."

GLOSSARY

Additionality.
The extent to which something happens as a result of an intervention that would not have occurred in the absence of the intervention.

Bankability.
Bankability refers to a project's capacity to secure financing by demonstrating it can reliably generate income, manage associated risks and offer a transparent return on investment. Achieving bankability entails designing projects that are attractive to private investors by delivering measurable financial returns.

Biodiversity credits.
A quantified unit of biodiversity uplift or conservation which can be bought and sold.

Biodiversity net gain (BNG).
A government policy implemented in England which ensures that nearly all new developments must leave biodiversity in a better state following development than before development. If developments are not able to do this within the spatial boundary of their development, they can buy offsets via an offset market.

Biodiversity offsets.
An improvement in biodiversity that is used to cancel out a loss of biodiversity elsewhere, typically implemented as the final stage of the mitigation hierarchy. Some biodiversity offsets are traded in nature markets.

Blended finance.
The complementary use of grants (or grant-equivalent instruments) and non-grant financing from private and/or public sources to provide financing on terms that would make projects financially viable and/or financially sustainable.

Buffer pool.
Credits (typically associated with carbon offset schemes) which are not sold, but are retained as a kind of insurance in case some of the predicted benefits of these schemes do not materialise or are reversed.

Carbon credits.
One carbon credit represents a reduction, avoidance or removal of one metric tonne of carbon dioxide or its carbon dioxide-equivalent resulting from project activities.

Counterfactuals.
Counterfactuals are hypothetical scenarios used to assess what would have happened if the intervention under evaluation had not been implemented. They are essential for determining the true impact and additionality of a financial mechanism or the intervention it supports.

Durability.
The quality of an ecological benefit being able to last for a long time without being reversed.

Elite capture.
Elite capture is the appropriation of resources or decision-making powers meant for the general public by a privileged few, who exploit these for personal gain. This undermines equity and often prevents the intended benefits from reaching the broader community, leading to increased inequality.

Environmental impact bonds.
A financing tool that uses performance-based contracts to provide up-front capital from private investors for environmental projects.

Green bonds.
A green bond is a fixed-income investment that funds projects with positive environmental impact.

Impact investment.
Investments that seek some form of financial return in addition to addressing environmental and social problems.

Internal rate of return (IRR).
A metric used in financial analysis to estimate the profitability of potential investments.

Jurisdictional approaches (JA).
As defined by Boyd et al. 2018, the JA is "a government-led, comprehensive approach to forest and land use across one or more legally defined territories." This method emphasises the importance of aligning local actions with national policies and international commitments, fostering collaboration among stakeholders and implementing robust monitoring and verification systems to ensure the effectiveness and integrity of carbon reduction efforts.

Key biodiversity areas (KBAs).
Sites that contribute significantly to the global persistence of biodiversity, in terrestrial, freshwater and marine ecosystems (IUCN).

Key performance indicators (KPIs).
A quantifiable indicator of progress toward an intended result.

Leakage.
The displacement of ecological impacts from one site or activity to another caused by restrictions on activities at that site.

Local ecological knowledge (LEK).
Local ecological knowledge (LEK) is the understanding of an area's ecosystem gained by residents through long-term, everyday interactions with their environment. It includes practical observations and skills developed over time and is often held by non-Indigenous communities, though it can overlap with traditional ecological knowledge (TEK) where Indigenous and local insights intersect. Please refer to Olsson, P., Folke, C., & Berkes, F. (2004). Adaptive co-management for building resilience in social-ecological systems. Environmental Management, 34(1), 75–90.

Mitigation hierarchy.
The mitigation hierarchy – established in the 1970s and embedded in legal and corporate frameworks globally – guides environmental planning by prioritising avoidance, minimisation, restoration and compensation/offsets for environmental impacts. It is applied in standards such as the International Finance Corporation's due diligence requirements and SBTN's AR3T corporate framework. Recently, Maron et al. (2024) emphasised that fully implementing the mitigation hierarchy is essential for genuine "nature positive" actions that truly benefit nature.

National biodiversity strategy and action plan (NbSAP).
A national biodiversity strategy and action plan (NbSAP) is a country's roadmap for conserving biodiversity and using it sustainably. Developed under the Convention on Biological Diversity, it outlines national priorities, sets goals and identifies actions across sectors to protect ecosystems, species and genetic diversity, supporting both environmental and sustainable development goals.

Nature-based solutions (NbS).
Nature-based solutions are actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being, biodiversity and climate benefits.

Payment for ecosystem services (PES).
Incentives offered to land managers in exchange for managing their land to provide some sort of ecological service.

Sustainability certification.
The process of earning official documentation as proof that a project has adhered to certain sustainability standards.

Taskforce for nature-related financial disclosure (TNFD).
A set of disclosure recommendations and guidance that encourage and enable business and finance to assess, report and act on their nature-related dependencies, impacts, risks and opportunities.

Traditional ecological knowledge (TEK).
Traditional ecological knowledge (TEK) is the accumulated knowledge, practices and beliefs about the environment held by Indigenous communities, developed over generations through a close relationship with nature. It includes practical and spiritual understandings of ecosystems, passed down through cultural traditions and contributes to sustainable resource use and conservation. Please refer to Berkes, F., Colding, J., & Folke, C. (2000). Rediscovery of Traditional Ecological Knowledge as Adaptive Management. Ecological Applications, 10(5), 1251–1262.

Voluntary carbon market (VCM).
A market for the trade in carbon credits.

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