SCALING UP ECOSYSTEM RESTORATION FINANCE

A Stocktake Report

UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

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The Finance Task Force is chaired by the World Bank with support from PROGREEN, a global partnership that works on strengthening the management of forests, promoting sustainable agriculture to reduce deforestation and land degradation, and seeking to lessen the impact of sectors such as infrastructure, transport and mining on the land.

PREFACE

The UN Decade on Ecosystem Restoration is an initiative led by the United Nations Environment Program (UNEP) and the Food and Agriculture Organization (FAO) of the United Nations, which aims to drive the restoration of one billion hectares of degraded land between now and 2030. The UN Decade is a rallying call for the protection and revival of ecosystems around the world, for the benefit of people and nature. Only with healthy ecosystems can we enhance people's livelihoods, counteract climate change, and stop the collapse of biodiversity.

The UN Decade Finance Task Force (FTF), chaired by the World Bank, aims to catalyze action which can contribute to unlocking the capital needed to meet the Decade's goals. 'Scaling Up Ecosystem Restoration Finance: A Stocktake Report' is the first in a series of outputs of the FTF. This report provides an overview of the current challenges to and opportunities for increasing public and private investment in restoration. It looks at innovative approaches to financing restoration activities taken by actors in the public, private, or non-profit sectors and the potential for these to be replicated or scaled. The report also lays out a draft roadmap of actions the FTF will take to overcome challenges and contribute to scaling investment in restoration.

The primary audiences of this report are governments and donors, the financial sector, and real-sector companies – all the decision makers with a role to play in scaling up finance for restoration. The scale of the converging climate change, nature loss, and land degradation crises requires coordinated cross-sectoral action to develop systemic solutions to these complex and pressing challenges. It is exactly this sort of collaboration that the FTF aims to support through the publication and its broader efforts.

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EXECUTIVE SUMMARY

Humanity is embedded in nature and depends profoundly on the goods and services it generates. Future economic development and well-being hinge on healthy and resilient ecosystems that provide our food and raw materials, drinking water, clean air, and the stability of the climate system. More than half of the world's gross domestic product (GDP) is generated in sectors such as construction and agriculture that depend on ecosystem services (WEF 2020), making nature relevant not only to policymakers, but also business and financial leaders.

Humanity's demands on nature currently far exceed its ability to regenerate. This gap is widening (GFN 2022), leaving vast areas of the planet degraded, and threatening provision of key ecosystem services. Three-quarters of Earth's ice-free land surface and two-thirds of its marine environment had been significantly altered as of 2019 and at least 20 percent of land surface is now degraded. Biodiversity is also in steep decline, with nearly 1 million animal and plant species (of 8 million recorded species) now threatened with extinction (IPBES 2019). This has taken a toll on nature's ability to provide goods and services – with 14 of the 18 assessed categories of ecosystem services, particularly regulating services, declining since 1970 (IPBES 2019). Bringing back the services of once degraded ecosystems – for example by restoring forests and agricultural soils or giving fisheries space to recover – benefits both people and the planet. Restoration is 'the process of halting and reversing degradation, resulting in improved provision of ecosystem services, and recovered biodiversity' (UN Decade 2021). Ultimately, restoration reverses the decline in the quantity and quality of the stock of natural assets. Loss of these assets can reverse development gains, aggravate fragility and conflict, and exacerbate climate change and climate impacts. Conversely, recovering ecosystem functionality through investments in restoration of degraded natural, semi-natural, production, and urban ecosystems is necessary to meet both the SDGs and the targets set in the Paris Agreement.

The importance of restoration is increasingly recognized, not least due to the challenges posed by climate change. However, more action and funding are urgently needed to scale up restoration. As climate change accelerates, healthy ecosystems will serve as a critical buffer against climate impacts. For example, the soil on a farm that has switched from conventional to regenerative farming practices will hold more water, helping to mitigate the impacts of both flooding and drought on crops. Likewise, a healthy mangrove can reduce the impacts on communities and infrastructure of a tropical cyclone.

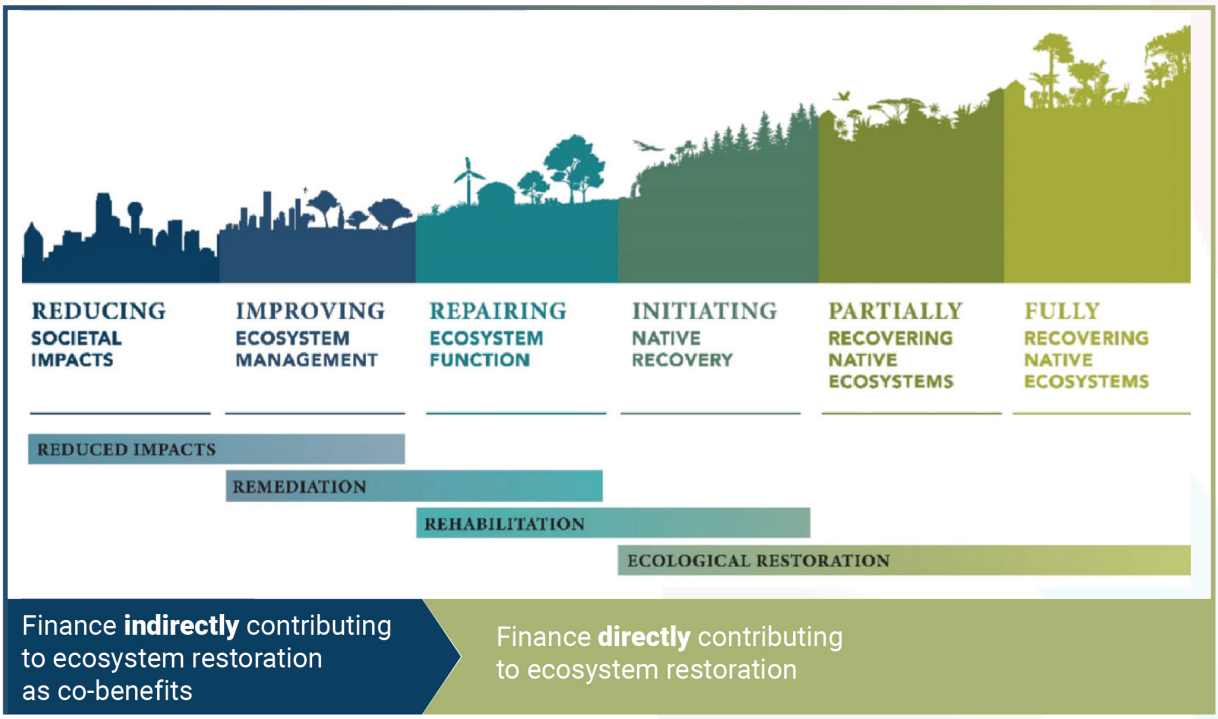


Figure ES-1: The Restoration Continuum (Source: adapted from Gann et al (2019))

Awareness about the value of nature and commitments to restore it by governments and the private sector are increasing – particularly as the world prepares for the post-2020 global biodiversity framework to be agreed upon at the CBD COP15. Governments, financial institutions, and businesses have committed/pledged themselves to increased restoration efforts through several high-level global commitments, such as the Bonn Challenge. However, as of 2021, land restoration initiatives represent/cover/encompass a small fraction of the area of degraded land thought to be suitable for restoration, and further areas continue to be degraded (UNCCD 2022).

Importantly, many pledges remain unfunded and financing restoration at scale remains a challenge. Most of the financing for restoration currently comes from public sources – and will not be sufficient to meet the amounts required to address the scale of the challenge. Moreover, there are large financial flows, including subsidies, that continue to drive environmental degradation (Deutz et al., 2020) and which are at least an order of magnitude greater than those that are beneficial (OECD, 2020; World Bank Group, 2020; 2021; Koplow and Steenblik, 2022). Mapping and monitoring private sector investment in restoration is hindered by definition and data challenges, but we know this funding is currently very low in relation to public spending and the overall need. Finance needs to be mobilized across the full restoration continuum (see Figure ES-1) – through both 'greening finance' – i.e. making sure that financing does not flow to activities which degrade nature – and 'financing green' – i.e. directing capital towards direct investments in restoration (see World Bank 2020a).

Restoration has enormous potential to generate market and non-market benefits for different types of investors. It is estimated that for every dollar spent on ecosystem restoration, between US$7 and US$110 in economic benefit is derived from ecosystem services gained.[1] Restoration can generate market benefits in the form of financial returns or savings, as well as social and environmental non-market benefits to public, private, and philanthropic investors (see Figure ES-2).

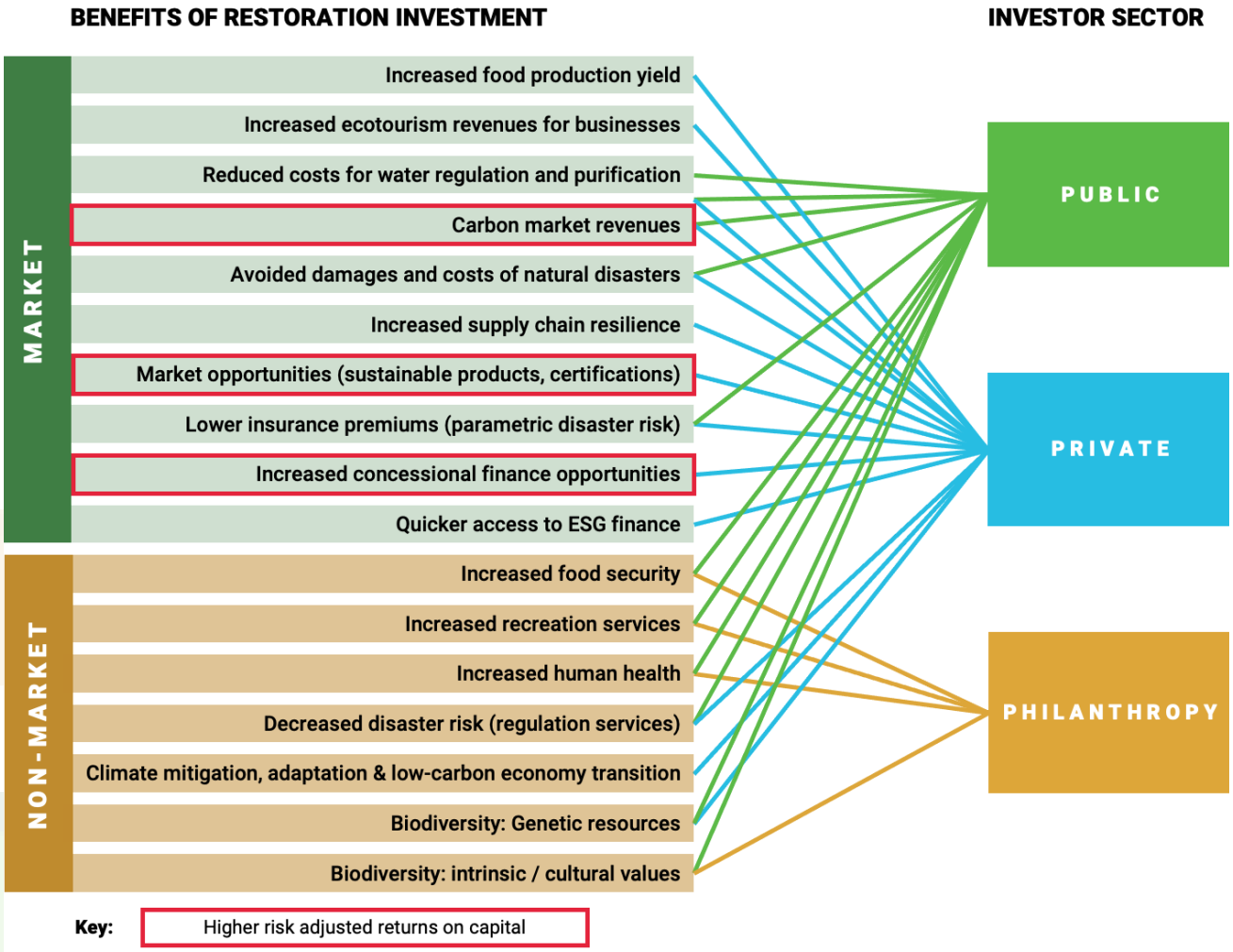


Figure ES-2: The benefits of restoration by investor sector

Note: Market benefits refer to those that typically generate financial returns or savings to investors, while non-market benefits are public in nature and do not usually generate cashflows.

1 Range based on a series of studies including FAO and UNEP 2021, Verdone and Seidl 2017, UNEP et al. 2018, Blignaut et al. 2014, Groot et al. 2013, and WRI 2017.

However, the economic and business case for different types of restoration projects has not been convincingly made. This stems from the concern that restoration is mostly an upfront cost, with long-term social and environmental benefits which cannot be easily monetized. Key drivers of underinvestment include:

- insufficient awareness about the critical role of ecosystem services in the economy and society;
- lack of taxonomy of restoration activities and standardized frameworks and institutions for managing a portfolio of restoration projects;
- inadequate knowledge and data on the costs and benefits of restoration;
- the structure and timing of the costs and benefits of restoration, which make the risk-return profiles of investments less competitive than other types of investments;
- lack of knowledge about bankable business models for restoration projects;
- difficulty monetizing the benefits of some types of restoration;
- taxes and subsidies that drive degradation and fail to incentivize restoration;
- lack of sectoral and financial policy and regulation that incentivize private sector investment in restoration; and
- land and sea tenure uncertainty or insecurity and unequal distribution of derived benefits, preventing sound governance and management of the natural assets.

Now is the time to act - and solutions do exist as market and regulatory dynamics are increasing the potential for recognizing nature's benefits. The fall in supply of ecosystem services coincides with growth in the global population, incomes, and consumption, as well as climate change, and contributes to potentially higher monetary values for ecosystem services. Monetizing the value of these benefits is key to unlocking more sources of private investment, in various ways. For example, while the extent of these interventions is still quite small, governments and the private sector are taking steps to develop and deepen payment for ecosystem services (PES) programs and markets, including for carbon storage and sequestration, water provision, and biodiversity credits, which can improve returns. Other sources of revenue, such as from ecotourism services and sustainably manufactured products, are also on an upward trajectory.[2]

2 Castro, M. 2022. The secret behind ecological developments that meet new sustainable tourism standards. [Online] Forbes.com Available from: https://www.forbes.com/sites/forbesbusinesscouncil/2022/07/21/the-secret-behind-ecological-developments-that-meet-new-sustainable-tourism-standards/?sh=4df434a87144

Cost savings and life cycle benefits from restoration are being integrated into project finance. Meanwhile, insurance markets are also taking steps to better account for increased resilience from restoration, which can result in reduced insurance premiums and ultimately cost savings.

However, there is a need for actors in the public, private, and non-profit sectors to take steps to accelerate the shift in the economics of restoration and address the barriers described above. Actors from across sectors can contribute to improving awareness about the important role of ecosystem services in our economies and communities. Additionally, these actors can take steps to design, expand, or improve the environmental and social impact of PES programs and markets. For example, steps could be taken to better integrate biodiversity into the voluntary carbon market and improve equitable benefit sharing. Additionally, countries can develop and implement national water PES programs. Governments have a critical role to play in developing and implementing nature-positive policy and regulation – urgently – by reforming fiscal programs to incentivize investment and restoration and to disincentive activities contributing to degradation. Governments can also pursue sectoral regulation that mandates restoration, and financial sector regulation that encourages financial institutions to shift to more nature-positive portfolios. Restoration involves a wide range of activities, including agroforestry, silvopasture, reforestation, mixed species plantations, riverbank restoration, natural regeneration,[3] assisted natural regeneration, and farmer-managed natural regeneration. While many actions can be taken that improve the economics of restoration across the full spectrum, there is a need for financing approaches, standards, and best practices to be developed for each category of restoration activities. Projects and businesses operating in each category can then be aggregated together within a given geography to increase the size of investment, diversify risk, and reduce the cost of capital. An agreed upon taxonomy or classification of restoration activities and associated investment opportunities could better enable this.

Developing and publishing information on restoration costs, benefits, business models, and best practices is critical to scaling investment in restoration. This information, aligned with the taxonomy described above, is needed to make a compelling investment case to the range of different actors, including governments, that can contribute to restoration.

3 Adapted by WRI from Contemporary forest restoration: A review emphasizing function, Elsevier B.V. 2014 and Sustainable Forest Management Toolbox, FAO 2017.

Cost and benefit data should be as localized as possible – providing information specific to countries and bioregions. There is particular urgency for this data for low- and middle-income countries, where the need for restoration investment is greatest and costs tend to be lower. Tools that enable governments, investors, and project developers to apply this data, and analytics that map out investment opportunities, could support restoration investment. The World Bank's analysis of the costs and benefits of large-scale mangrove restoration in Indonesia provides an example for how this could be approached (World Bank 2022). Analysis of benefits should apply a broad lens to provide a holistic picture of the impact of restoration, and may include granular data and local knowledge, including from indigenous peoples and local communities. Additionally, there is a need to develop case studies demonstrating business models and best practices for developing bankable restoration projects that generate positive economic and environmental impacts.[4] Once these steps are complete, public, private, and non-profit actors can collaborate to link investment needs and opportunities with appropriate funding sources.

For example:

- Corporations represent an important potential source for restoration finance through investment in resilient supply chains for food and fiber-based products, (Bancilhon et al., 2018).

- Institutional investors are looking for opportunities with market returns that are compatible with or contribute to their net zero and sustainability goals and commitments.

- Impact investors and philanthropic finance weight environmental and social impacts more highly than traditional investors, and may be willing to pay for impact.

- Public and concessional finance can be blended with the sources detailed above to de-risk or credit enhance.

A key challenge is enabling locally led initiatives to access capital from large financial institutions and donors. Many of the most impactful restoration interventions are being implemented through small projects led by local actors.

4 An example is WFF's Bankable Nature Solutions report. Available at https://www.panda.org/discover/our_focus/finance/bankable_nature_solutions/

India / © Paulose NK / Shutterstock

Thus financing restoration at scale often requires a coalition of investors and donors that support a consortium of actors implementing a suite of actions on the ground.[5] It is critical to improve the efficiency and standardization of portfolio management so such financing can be scaled up. Lessons and best practices can be drawn from programs such as Initiative 20x20, AFR100, and the Great Green Wall Initiative.

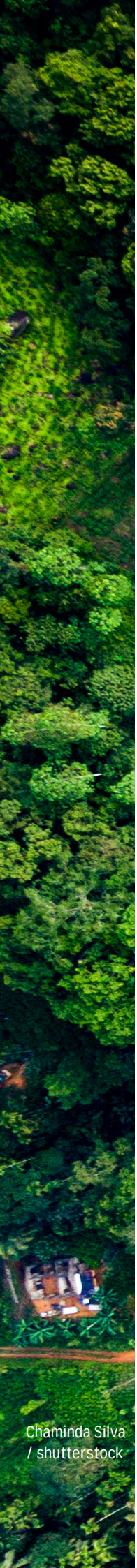
These actors can also collaborate on developing investment vehicles for standardization that enables replication and aggregation to reduce the cost of capital for restoration projects. Standards and labels will be critical to enabling the flow of capital to often small-scale projects. Compared with the engineering standards used for infrastructure, restoration projects are likely to have more process-focused standards or labels, as by definition restoration will require unique practices which will have a distinct impact in each bioregion.

The role of the UN Decade Finance Task Force (FTF) is to catalyze actions which can contribute to unlocking the capital needed to meet the Decade's goals. The FTF will coordinate catalytical research, tools, datasets, projects, and partnerships and take steps to increase awareness and foster political will in the public or private sectors, in support of scaling up investment in ecosystem restoration. This Stock Take report is the first in a series of FTF outputs that will chart the course of the Task Force efforts through 2030. Based on the Stock Take, a Roadmap will be developed which will lay out the work of the FTF in the coming years, covering primary research which the FTF will conduct through its members and also using the FTF to showcase the work of others, relevant to the financial sector. The Roadmap will be structured around the following key pillars of work, with initial workshops covering these topics kicking off in early 2023.

RIGHT: Table ES-1: FTF Roadmap Pillars (to be further developed)

5 Sean Dewitt. WRI. Personal communication, September 2022.

PILLARS	FTF OUTPUTS	PARTNER OUTPUTS
PILLAR 1: GOVERNMENT AND SECTORAL POLICY LEVERS	• Identification and promotion of relevant work by partners	• Research on how to create a supportive enabling environment for restoration • Case studies on successful subsidy reform/ PES programs, frameworks, or regulation • Case studies on successful landscape-scale integrated planning
PILLAR 2: KNOWLEDGE, DATA, AND TOOLS	• Taxonomy of restoration activities • Restoration cost/ benefit database, analytics, tools, and training • Restoration trade-offs assessment guide	• Presentation of key restoration data sets to a group of relevant private sector actors and collect feedback on additional data needs • Tracking and analysis of restoration investment flows • Approach for integrating credits for co-benefits with carbon credits (i.e. biodiversity, water, etc.) • Publications, guidance, and/or support for countries and the private sector on natural capital accounting
PILLAR 3: FINANCIAL SECTOR REGULATION AND INITIATIVES	• Review of key financial sector regulation, guidance, and analytical tools to ensure restoration is appropriately accounted for (i.e. taxonomies, credit rating methodologies, risk assessment approaches, etc.)	• Workshops exploring how to better integrate restoration into financial sector regulation, guidance, and analytical tools • Analytical papers assessing potential to better integrate restoration
PILLAR 4: FINANCIAL MARKETS AND INVESTMENT INSTRUMENTS	• Templates for replicable or scalable investment structures (typology of restoration investments) • Publication assessing Monitoring, Reporting and Verification (MRV) cost reduction trends and barriers	• Case studies showcasing restoration investment and regenerative business models • Provide input or technical assistance to investment platforms • Support standardization of investment contracts • Standards/label for NbS projects – building on FAST Infra's Sustainable Infrastructure Label • Cooperation with the UN Decade Best Practices Task Force to implement the Capacity, Knowledge and Learning Action Plan • Guidance to UN Decade partners leading Restoration Challenge for Finance



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1. WHAT IS RESTORATION?

The role of the UN Decade Finance Task Force (FTF) is to catalyze action which can contribute to unlocking the capital needed to meet the Decade's goals.[6] This Stock Take report is the first in a series of outputs of the FTF outlining approaches that could unlock financing for ecosystem restoration, and charting the course of the Task Force efforts through 2030. This report provides an overview of the current challenges and opportunities for increasing public and private investment in restoration and suggests a pathway to overcome obstacles to scale up financing. The primary audiences of this report are governments and donors, the financial sector, and real-sector companies – all the decision makers with a role to play in scaling up finance for restoration.

The UN Decade on Ecosystem Restoration defines ecosystem restoration as 'the process of halting and reversing degradation, resulting in improved ecosystem services, and recovered biodiversity' (UNEP 2021a, p.7). Depending on objectives, restored ecosystems can follow different trajectories:

- from degraded natural to more intact natural ecosystems
- from degraded, modified ecosystems to more functional modified ecosystems with enhanced ecosystem services flows (e.g., restoration of urban areas and farmlands)
- from modified ecosystems towards healthy natural ecosystems, providing that the rights and needs of people who depend on that ecosystem are not compromised

Ecosystem restoration encompasses a continuum of practices and goals, depending on local conditions and societal choice (UNEP, 2021a). Restorative practices can enhance ecological health actively or passively (enabling natural regeneration), or through a combination of both.

The 'restorative continuum' (Gann et al. (2019)) – see Figure 2 below - groups the range of restorative actions into the following four classes.

i. **Reducing** degrading impacts – transforming economies and production systems toward sustainable use.

ii. **Remediation** – bio-physical manipulation to **reinstate** basic ecological functions such as hydrology regimes.

6 More information about the Finance Task Force is available at: https://www.decadeonrestoration.org/task-forces/finance

iii. **Rehabilitation** – the progressive **repairing** and enhancement of function and integrity to increase ecosystem service flows.

iv. Ecological **Restoration** – representing the highest ecological ambition, with specific native biodiversity goals referencing a benchmark.

The 10 principles for ecosystem restoration adopted by UN Decade provide a framework for maximizing net gains for native biodiversity, ecosystem health, human health and well-being, across all biomes, sectors and regions (FAO et al., 2021). They emphasise a wide breadth of restorative actions which need to be embedded in local contexts through broad engagement with measurable SDG-aligned goals (Figure 2). Investments in restoration repair ecosystem function or support native species recovery, resulting in improved ecosystem services and recovered biodiversity. Examples of direct investments in restoration are those that promote sustainable management of farmlands or grasslands such as agroforestry, silvopasture, or investments in forest, mangrove, or peatland restoration (through planting of native species or natural regeneration). These generate benefits to a diverse set of stakeholders from the public and private sectors.[7] Investments that reduce societal impacts or improve ecosystem management contribute indirectly to ecosystem restoration.[8]

Figure 1: Ten principles that underpin ecosystem restoration (Source: UN Decade on Ecosystem Restoration 2021.)

7 Anderson, W. 2021. Pressing Questions About Ecosystem Restoration, Answered. [Online] WRI.org. Available from: https://www.wri.org/insights/ecosystem-restoration-questions

8 Though indirect investments do not strictly adhere to the UN Decade restoration principles, they are certainly part of the broader transition to nature-positive economic practices (Figure 2) (FAO et al., 2021).

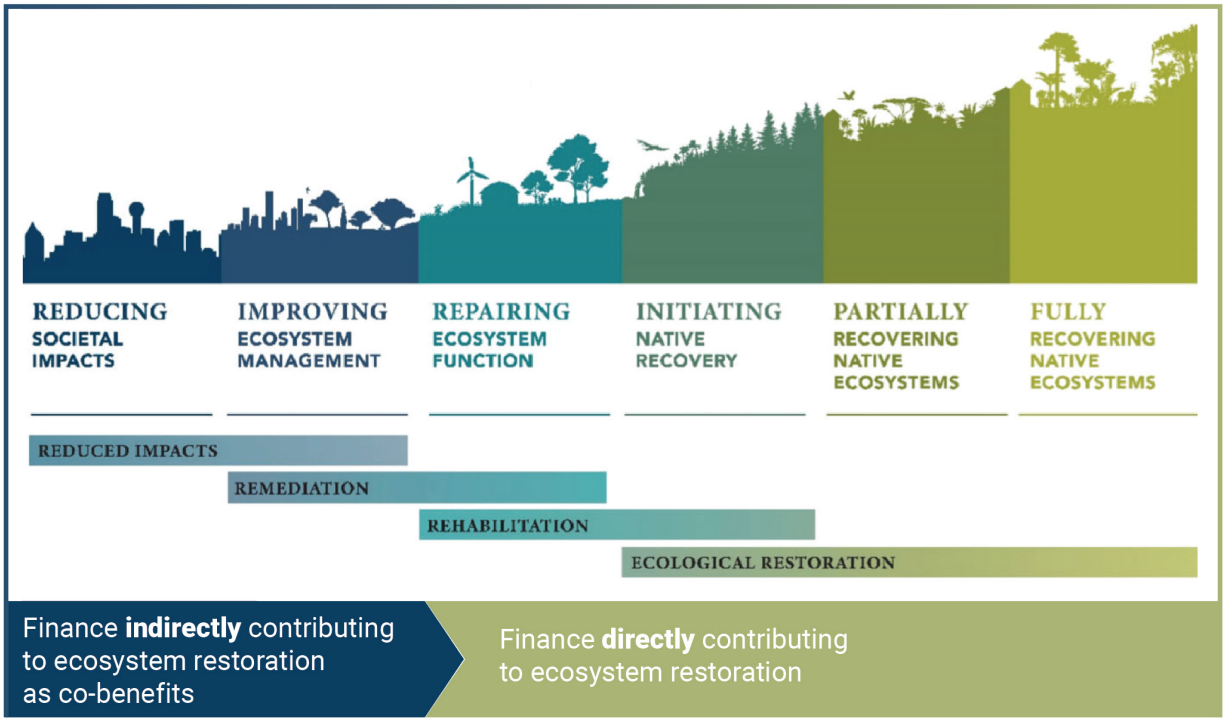


Figure 2: Direct and indirect contributions of investments towards ecosystem restoration, by stage of the restorative continuum (Source: Adapted from Gann et al (2019))

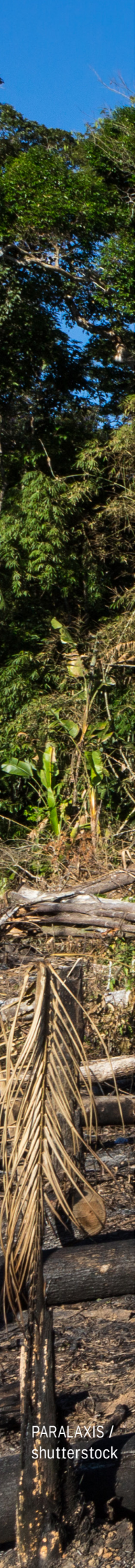
Restoration is one in a set of interventions, often referred to as nature-based solutions (NbS) - where direct investments in restoration complement conservation and sustainable-use-related activities. NbS are defined by the UN as actions to *'protect, conserve, restore, sustainably use and manage natural 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'* (UNEA, 2022). Direct investments in restoration often build on other interventions that address the drivers of degradation, and conserve or create an enabling environment for sustainable resource management. Most NbS, no matter their primary objective, provide an opportunity to contribute to restoration. Large-scale restoration is required to meet nature recovery 2050 goals,[9] but it needs to take place in tandem with the conservation of critical ecosystems. Similarly, large investments in restorative natural climate solutions will be required to meet climate mitigation and adaptation goals, but only in combination with conservation and sustainable management, which are often more cost-effective than restoration (Cook-Patton et al., 2021).

9 Restoration is a 'sought-after outcome' in the 2050 Vision and 2030 mission of the Convention of Biological Diversity, based on the first draft of the post-2020 Global Biodiversity Framework.

Integrating restoration objectives more prominently in investments into conservation and sustainable use can considerably strengthen their environmental and social benefits, and contribute to the sustainability of these investments.

Opportunities for restoration exist across the urban, agricultural, and natural ecosystems, and can be cost effective for meeting the SDGs in both cities and rural areas (IPBES, 2019)**.** With green urban design and integrated strategic restoration planning in the wider landscape, there is a possibility to reconnect natural ecosystems across urban and productive landscapes with mosaics of green-grey infrastructure and natural habitats, and to increase biodiversity in the most developed areas, where it is often most threatened.

Chad / © Andrea Borgarello-World Bank-TerrAfrica



PARALAXIS / shutterstock

2. WHY SCALING UP INVESTMENTS IN RESTORATION IS CRITICAL

Humanity is embedded in nature, and depends profoundly on the flow of goods and services it generates. Future economic development and well-being hinge on healthy and resilient ecosystems that provide our food and raw materials, drinking water, clean air, and the stability of the climate system. More than half of the world's gross domestic product (GDP)—is generated in sectors such as construction and agriculture that depend on ecosystem services (WEF 2020), making nature relevant not only to policymakers, but also business and the financial sector.

Humanity's demands on nature currently far exceed its ability to regenerate, and this gap has been widening (GFN 2022), leaving vast areas of the planet degraded, and threatening the provision of key ecosystem services. Three-quarters of Earth's ice-free land surface and two-thirds of its marine environment had been significantly altered as of 2019, and at least 20 percent of land surface is now degraded. Biodiversity is also in steep decline, with nearly 1 million animal and plant species (of 8 million recorded species) now threatened with extinction (IPBES 2019). This has taken a toll on nature's ability to provide goods and services – with 14 of the 18 assessed categories of ecosystem services, particularly regulating services, declining since 1970 (IPBES 2019).

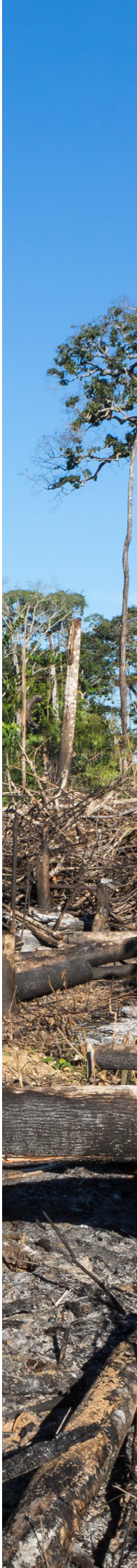
Global environmental risks such as natural resource crises, biodiversity loss, extreme weather, human environmental damage, and climate action failure have emerged among the top 5 risks perceived to be of the highest likelihood and have the greatest future economic impact in recent annual WEF Global risks reports. In 2022, for the first time all the top five long term risks (5-10 years) were environmental risks (WEF, 2022).

Bringing back the services of once-degraded ecosystems – for example by restoring forests and agricultural soils or giving fisheries space to recover – benefits both people and the planet. Ultimately, restoration reverses the decline in the quantity and quality of the stock of natural assets. The loss of these assets can reverse development gains; aggravate fragility and conflict, and exacerbate climate change and climate impacts. Conversely, to meet both the SDGs and the targets set in the Paris Agreement, it is necessary to recover ecosystem functionality through investments in restoration of degraded natural, semi-natural, production, and urban ecosystems.

Avoiding further degradation and building the resilience of natural assets to accelerating climate change is crucial. As climate change accelerates, many natural environments will need restoration to remain resilient to - and counteract any degradation driven by - climate change, such as desertification or shifting species ranges (Morecroft et al., 2019). The loss and degradation of terrestrial and marine ecosystems releases carbon, and can cause a vicious cycle of carbon loss. For example, parts of the Amazon forest now emit more carbon dioxide than they absorb, due to deforestation and climate change (Gatti et al., 2021).

Lack of investment in restoration will create limits to sustainable prosperity of companies and countries (Dasgupta, 2021) because most assessed[10] ecosystem services are already declining globally (IPBES, 2019). WEF 2020 estimates that more than half the world's GDP (USD 44 trillion) is generated by sectors that are directly dependent on ecosystem services.[11] Despite a high degree of sector dependencies on nature, conventional economic models do not account for the declining trends in nature's services and thus provide an overly optimistic scenario of economic growth. When the loss of nature's benefits to people is included, growth in global GDP by 2030 slows considerably (Johnson et al., 2021). Globally, land degradation is estimated to cause a loss in ecosystem service value of US$6.3 trillion each year. This loss is more than three times larger than the entire value of agriculture in the market economy (Sutton et al., 2016).

Countries such as Costa Rica and India demonstrate how restoration, conservation and development can go hand in hand. Costa Rica increased its forest cover from 26 percent in 1983[12] to 59 percent in 2020 (FAO 2020), while more than doubling its GDP per capita over this same period. A mix of restoration and conservation interventions, including Payments for Ecosystem Services (PES), brought back biodiversity and ecosystem services that have become the basis of a vibrant tourism sector, directly contributing an estimated 6.3 percent of Costa Rica's GDP in 2018.[13] In India, the Mahatma Gandhi National Rural Employment Guarantee, with 80 million participants, supports irrigation, afforestation, soil conservation,[14] and watershed development, with potential for



10 14 out of the 18 ecosystem services assessed by IPBES showed declines since 1970 and modelling did not account for many of the ecosystem service sources identified by the 2005 Millennium Ecosystem Assessment.

11 This is a conservative estimate because it excludes indirect dependence through supply chains.

12 World Bank. 2016. Accounting reveals that Costa Rica's forest wealth is greater than expected [Online] World Bank website. Available from: https://www.worldbank.org/en/news/feature/2016/05/31/accounting-reveals-that-costa-ricas-forest-wealth-is-greater-than-expected

13 Based on data available from the Central Bank of Costa Rica website (https://www.bccr.fi.cr/indicadores-economicos/cuenta-sat%C3%A9lite-de-turismo) The link directs you to the Tourism webpage and the estimate included in the text is not readily available there

14 Hallegate, S. et al. 2020. Thinking ahead: For a sustainable recovery from COVID-19 (Coronavirus)

contributing to carbon sequestration.[15] These types of programs, if carefully designed, can facilitate long-term economic transformation.

Given the multiple economic and financial benefits associated with ecosystem restoration, governments, financial institutions,[16] and businesses[17] have committed to increased restoration efforts through several high-level global initiatives. Restoration is incorporated in all three Rio Conventions – on Biodiversity, Climate Change, and Desertification. The Bonn Challenge (covering voluntary actions), launched in 2011, aims to bring 350 million hectares of the world's deforested and degraded land into the process of restoration by 2030.

The African Forest Landscape Restoration Initiative is another country-led effort to bring 100 million hectares of land in Africa into restoration by 2030. As of 2021, global commitments for land restoration by 2030 total one billion hectares, half the total are of degraded land thought to be suitable (UNCCD, 2022).

Scaling up investment in restoration, and NbS more broadly, has been signalled as a necessary part of meeting multiple sustainable development and business goals.[18] These include targets for climate[19] (Griscom et al., 2017; Cook-Patton et al., 2021), food security and land degradation,[20] many SDGs,[21] and biodiversity.[22]

WB (Online). Available from: https://blogs.worldbank.org/climatechange/thinking-ahead-sustainable-recovery-covid-19-coronavirus

15 Moudgli, M. 2021. Rural job scheme guarantees carbon sequestration. Mongabay (Online) Available from: https://india.mongabay.com/2021/06/rural-job-scheme-guarantees-carbon-sequestration/

16 An example is the MDB Joint Statement released in 2021. Available from: https://ukcop26.org/mdb-joint-climate-statement/

17 An example is the 2014 NY Declaration on Forests and One Planet Business for Biodiversity. Available from: https://www.wbcsd.org/Projects/OP2B

18 Examples include the WBCSD setting science-based target for nature membership criteria, the global coalition Business for Nature platform, and the Finance for Biodiversity Pledge

19 As mentioned in the Glasgow Climate Pact in the UNFCCC –Cop26, which "emphasizes the importance of protecting, conserving and restoring nature and ecosystems to achieve the Paris Agreement temperature goal, including through forests and other terrestrial and marine ecosystems acting as sinks and reservoirs of greenhouse gases and by protecting biodiversity, while ensuring social and environmental safeguards". Available from: https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf

20 UNCCD 2022

21 The Fifth Session of the United Nations Environment Assembly (March 2022) made a resolution on adopting a multilaterally agreed definition of nature-based solutions (NbS); recognizing the important role they play in the global response to climate change and its social, economic and environmental effects. Available from: https://www.unep.org/news-and-stories/press-release/un-environment-assembly-concludes-14-resolutions-curb-pollution

22 During the CBD COP15 many participants called for ambition and action to reach 2030 biodiversity targets. Available from: https://www.cbd.int/doc/c/d707/6fca/f76569ac6b47ae9930a3b251/cop-15-04-en.pdf

The Leaders' Pledge for Nature[23] marked a turning point in political recognition of the need for scaling up restoration investment through calls for biodiversity loss to be reversed by 2030 as a necessary foundation for sustainable development. Many actors in the public, private, and non-profit sectors have already made pledges for significant investments in NbS. For governments, this may come in the form of NbS for climate resilience, while for corporates this may look like NbS carbon emissions removal projects. A scaled-up implementation of NbS for climate mitigation was recognized at the 2019 UN Climate Action Summit as critical to slowing and reversing climate change.[24]

To ensure that healthy ecosystems contribute towards achieving the SDGs by 2030, the United Nations General Assembly has proclaimed 2021-2030 the UN Decade on Ecosystem Restoration. The primary aim of the UN Decade for Restoration is to prevent, halt, and reverse the degradation of ecosystems worldwide.

Leveraging its 110+ strong partner network, the UN Decade plans to achieve this through a collaborative effort along three main pathways:

1. A peer-driven, **participatory global movement** that focuses on upscaling restoration.

2. Fostering **political will** so that leaders in the public and private sectors support the global movement and champion restoration.

3. **Catalytical research and development** that generates the technical capacity that is needed to restore ecosystems at scale.

Through these collaborative pathways, the UN Decade will address six barriers to catalyze a global movement for large-scale restoration, namely: public awareness, political will, legislative and policy environments, technical capacity, finance, and scientific research.

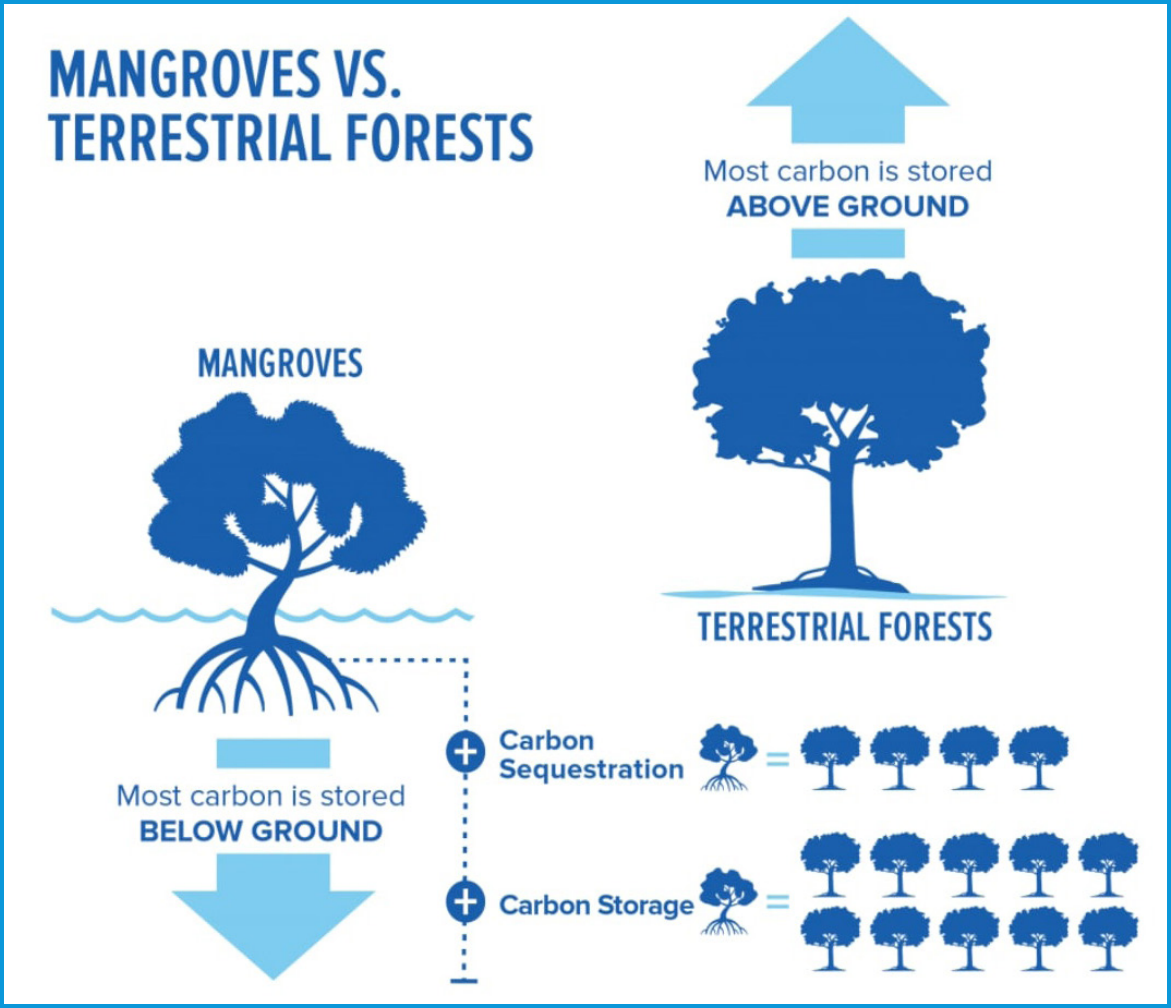
23 The Pledge is available at: https://www.leaderspledgefornature.org/wp-content/uploads/2021/06/Leaders_Pledge_for_Nature_27.09.20-ENGLISH.pdf

24 It is estimated that 'natural climate solutions' with safeguards are estimated to provide 37 per cent of climate change mitigation until 2030 needed to meet the goal of keeping climate warming below 2°C, with likely co-benefits for biodiversity (IPBES, 2019).

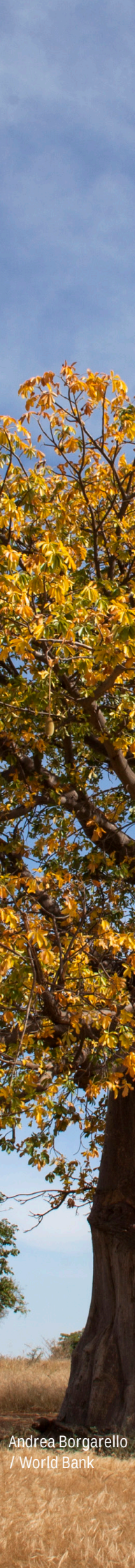
BOX 1: DELTA BLUE CARBON PROJECT IN PAKISTAN

In 2015, Indus Delta Capital Private Limited joined forces with the Forest and Wildlife Department of the Government of Sindh, Pakistan to launch the Delta Blue Carbon Project. The world's largest blue carbon project, Delta Blue Carbon is aimed at protecting and restoring 350,000 hectares of tidal river channels and creeks, low-lying sandy islands, mangrove forests, and inter-tidal areas on the south-east coast of Sindh. Mangrove forests sequester 3-5 times more CO2 per hectare than upland tropical forests, and the project is engaging in large scale mangrove planting across the delta. In total 220,000 hectares will be planted, the largest restoration programme in the world. To date, over 70,000 hectares have been planted. The project will operate over a 60-year lifespan, and will generate over 128.5 million high-quality credits and sequester 142 million tonnes of CO2.

Figure Box 1: Mangrove vs. Forestry Carbon Capture Potential
(Source: Reef Resiliance Network. (2020). Blue Carbon Introduction)



Mangroves in Sindh, Pakistan
© Danish Iqbal/Shutterstock



Andrea Borgarello / World Bank

3. RECONCILING THE INVESTMENT RATIONALE AND THE FINANCING GAP

Restoration has enormous potential to generate market and non-market benefits for different types of investors. It is estimated that for every dollar spent on ecosystem restoration, between US$7 and US$110 in economic benefit is derived from ecosystem services gained[25]. Restoration can generate market benefits in the form of financial returns or savings, as well as social and environmental non-market benefits to public, private and philanthropic investors (see Figure ES2).

Nature-smart policy pathways are less financially and politically costly to implement than they are perceived to be. Restoration policies are forecast to generate substantial economic and environmental benefits, with very little net negative impact on GDP growth. For example, the integrated ecosystem-economy modelling led by the World Bank (Johnson et al., 2021) demonstrates that meeting the "30x30" target (30 percent protected or restored by 2030) of the draft post-2020 global biodiversity framework may result in only a 0.1 percent decline of global GDP in 2030, compared with business-as-usual, because of the enhanced provision of ecosystem services resulting from additional nature conservation in the model. The predicted reduction is even smaller when adjusted for the climate change mitigation co-benefits of natural areas.

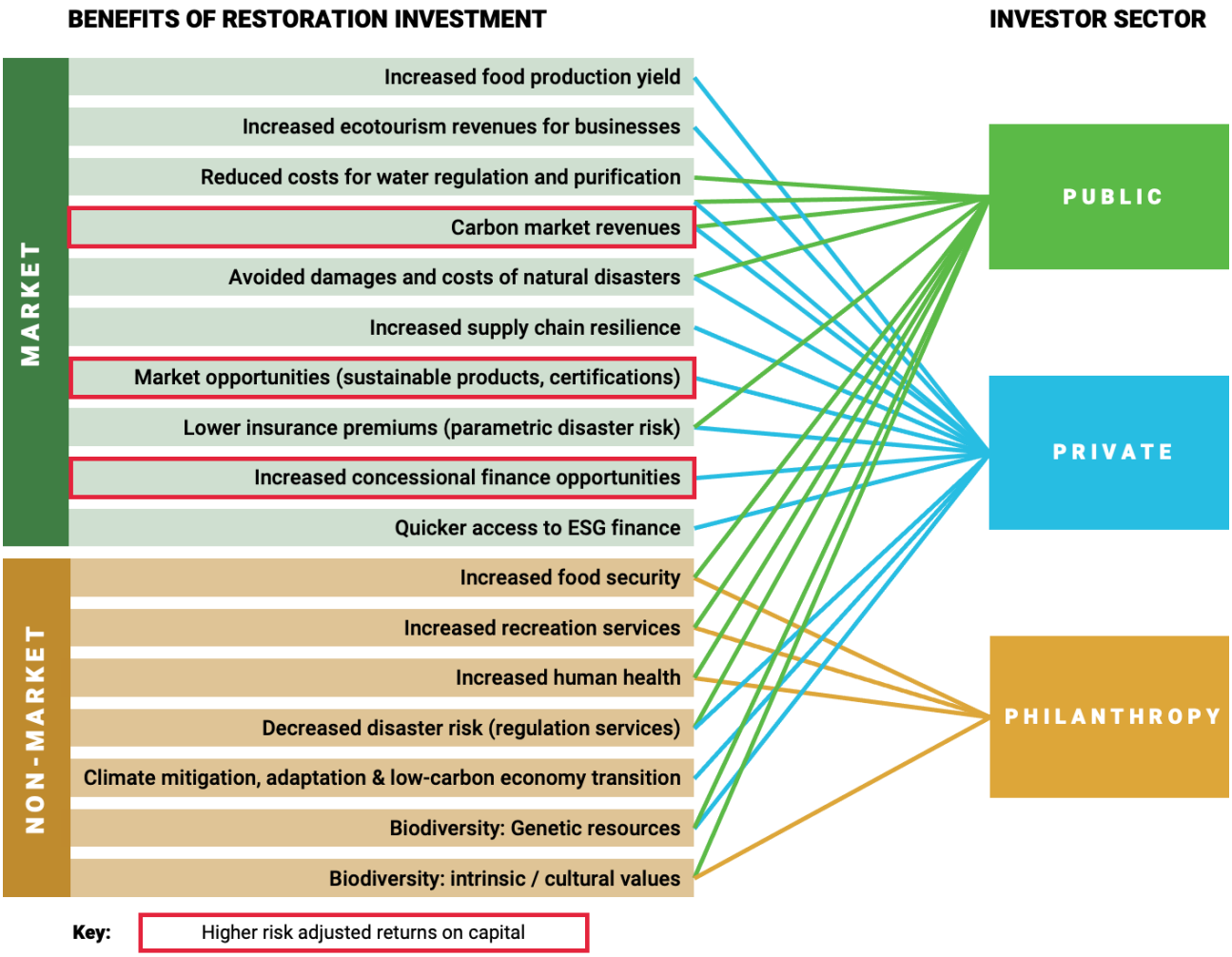
Public, private, and philanthropic investors have different but overlapping and often synergistic investment rationales. Public and philanthropic investors tend to have the broadest investment rationales, inclusive of wider economic and public benefits, whereas private sector parties are more focused on financial returns and a smaller scope of economic returns driven by risk management. However, none of these three broad investor types aim exclusively for either economic returns or financial ones. For example, a government fund may invest in a natural asset company partly to earn a financial return and partly to generate public goods. Public, private, and philanthropic investors can be motivated by financial returns generated by investments in restoration, for example in sustainable forestry. But they will also be interested in broader economic benefits, including social and environmental benefits, which may be valued by public decision-makers but are not always monetized by private investors.

25 Range based on a series of studies including FAO and UNEP 2021, Verdone and Seidl 2017, UNEP et al. 2018, Blignaut et al. 2014, Groot et al. 2013, and WRI 2017.

Figure 3 shows a range of benefits, broadly classified into three main drivers of restoration investment:

1. Pursuing business opportunities and/or risk management.
2. Addressing climate mitigation, disaster resilience or adaptation targets.
3. Meeting sustainable development and biodiversity goals.

Figure 3: Benefits of Restoration by Investor Sector



Note: Market benefits refers to those that typically generate financial returns or savings to investors, while non-market benefits are those that are public in nature and do not usually generate cashflows.

However, scaling up restoration action to meet the many pledges made and reap the potential benefits faces significant challenges, including a large financing gap. While there are no comprehensive estimates of either restoration finance spending or cost to meet goals, available evidence from analyses of biodiversity and nature-based solutions (NbS), or natural climate solutions investments (Deutz et al., 2020), (UNEP, 2021b) (Climate Policy Initiative, 2021) points to low direct investment in restoration. This shortfall in investment creates a large funding gap compared with levels implied by 2030 goals (ibid) (See Box 2).

Currently available data on NbS and biodiversity finance flows only partially capture figures for restoration. This applies both to direct restoration investment, and indirect restoration finance - where expenditures and risk management activities have restorative outcomes as a secondary objective, or a co-benefit. As of 2019, current spending on biodiversity conservation was between US$124 and US$143 billion per year

BOX 2. FINANCIAL SECTOR APPROACH TO RESTORATION FINANCE

Currently the financial sector does not distinguish restoration finance as a separate class of investment. Restoration finance is considered a sub-set of nature finance, which is itself a sub-set of sustainable finance (that considers environmental, social, and governance 'ESG' factors alongside conventional financial analysis) (see Figure 3).

Restoration is mentioned explicitly as a 'qualifying activity' in various definitions of *biodiversity finance*, including those used by BIOFIN (2018) and OECD (2020). Most biodiversity or sustainable finance will have restoration co-benefits that would ideally be captured by investment data and decision-making processes.

Restoration is also a sub-set of climate finance given restoration efforts can mitigate climate change and reduce its impacts (CPI 2021, IPBES 2019, Strassburg et al. 2020).

Figure-Box 2: Restoration Finance in the Broader Sustainable Finance Landscape

(Deutz et al., 2020), an unknown amount of which targeted restoration. About US$133 billion is spent on NbS more broadly, of which sum a reasonable part would be restorative (UNEP, 2021b). Only a small fraction (6 percent) of 2020's estimated US$632 billion in climate finance flows went into land use or water-related activities, and only a smaller proportion of this into restoration (Climate Policy Initiative, 2021).

The financing gap for investments in conservation, restoration, and sustainable use of nature needed to reverse the decline in nature loss by 2030 is estimated to be between US$98 billion and US$824 billion per year (Deutz et al., 2020). This means that a scaling up factor of at least several folds is required. Annual financing needs to successfully implement the post-2020 global biodiversity framework over the coming decade is estimated to be at least US$700 billion. Investment in NbS must at least triple in real terms by 2030 and increase four-fold by 2050 if the world is to meet its climate change, biodiversity, and land degradation targets. This equates to a future annual investment rate of US$536 billion. Forest-based solutions alone could amount to US$203 billion per year, followed by silvopasture[26] at US$ 193 billion per year, peatland restoration at US$7 billion per year, and mangrove restoration at US$0.5 billion per year (UNEP, 2021b).

Critically, financial flows that are harmful to nature, including subsidies, are at least an order of magnitude greater than those that are beneficial (OECD, 2020; World Bank Group, 2020; 2021; Koplow and Steenblik, 2022). Nature Finance (*previously* F4B, 2021a) estimates the collective damage to nature of US$800 billion annually arising from the US$11 trillion invested by Public Development Banks – equivalent to 7 cents for every dollar invested. Therefore, changes at the policy level and of the practices of public financial institutions, although not necessarily producing direct restorative outcomes, is a vital component of the nature recovery agenda, as it reduces drivers of degradation that would otherwise widen the recovery gap. A significant proportion of the financial gap could in fact come from redirecting, repurposing, reforming, or eliminating incentives harmful for biodiversity[27].

The economic and business case for different types of restoration projects has not been convincingly made, which leads to this massive underinvestment.

26 Silvopasture is the deliberate integration of trees and grazing livestock operations on the same land. These systems are intensively managed for both forest products and forage, providing both short- and long-term income sources.

27 Based on CBD Secretariat (2021a); CBD Secretariat (2021b)

This stems from the concern that restoration is mostly an upfront cost, with long-term social and environmental benefits which cannot be easily monetized. Failure to capture the value generated by improved ecosystem services deriving from restoration interventions (especially the public benefits), will lower return expectations, and thus reduce investment in restoration (WRI 2017). Valuing and monetizing a wider range of the benefits of restoration, including ecosystem services, are critical to stimulating both public and private investment. Key drivers of underinvestment include:

- insufficient awareness about the critical role of ecosystem services in the economy and society;
- inadequate knowledge about data on the costs and benefits of restoration;
- the structure and timing of the costs and benefits of restoration, which make the risk-return profiles of investments less competitive than other types of investments;
- lack of knowledge about bankable business models for restoration projects;
- difficulty monetizing the benefits of some types of restoration;
- lack of standardized frameworks and institutions for managing a portfolio of restoration projects; lack of a taxonomy of restoration activities;
- taxes and subsidies that drive degradation and fail to incentivize restoration;
- lack of sectoral and financial policy and regulation that incentivize private sector investment in restoration; and
- land and sea tenure uncertainty or insecurity and unequal distribution of derived benefits, preventing sound governance and management of the natural assets.

Investments in restoration can generate direct market returns through avoided costs and markets for ecosystem services and sales of sustainable products. They can also generate non-market benefits that can be attributed significant value, but are not always monetized. Market and non-market benefits from restoration investment often exceed the initial capital requirements (GCEC, 2014; Verdone and Seidl, 2017). For private investors, the business case will depend on the time and risk adjusted financial returns (FAO, 2022)[28] and how inclusive it is of broader economic benefits.

28 For example, many agroforestry projects contributing to nature recovery at the rehabilitation step of the restorative continuum do have a financial return but spread over a longer time horizon and when risk-adjusted are often not attractive compared to other investment options (e.g., a profitable return from agroforestry can take up to eight years compared with 1–2 years for annual crops).

When both the market and non-market benefits of natural capital assets are accounted for, the benefits of restoration can far exceed the costs. However, the lack of monetary value for many of the provisioning ecosystem services resulting from investments, often partly provided to public parties, is an obstacle to scaling investment flows.

Another challenge for restoration projects is that the benefits of restoration efforts can take many years to accrue. To be effective, restoration interventions should be designed for longevity, and to optimize positive impacts related to biodiversity, climate change mitigation and adaptation, equity, and sustainable development (Girardin et al 2021). Additionally, project design should consider and plan for the full range of costs over the lifetime of the project at the outset, so far as possible, to ensure durability and impact. The challenges of planning for costs over long time horizons in both the public and private sectors, as well as the trade-offs associated with restoration interventions (see Box 3), should be acknowledged and managed (Sarabi, 2020).

BOX 3: RESTORATION TRADE OFFS

Restoration efforts involve trade-offs, which should be carefully assessed, and the impacts managed. The net benefits of a restoration project and their distribution are dependent on the objectives, degree of degradation, restoration costs, ecosystem type, location, proximity of indigenous peoples and local communities, and the opportunity costs. Decision support tools such as cost-benefit analysis and multi-criteria analysis can be used in the analysis and comparison of benefits from a range of interventions and the design of a project that prioritizes key benefits and manages distributional trade-offs. There are often trade-offs between restoring ecosystem functionality holistically, focusing on carbon storage and sequestration, or devoting land for productive uses, and creating jobs, inter alia. Additionally, the economic and financial benefits of various interventions are changing as PES programs and markets develop and deepen – modelling can take these changes into account. Moreover, since the restoration of ecosystems often involves a combination of approaches that includes the long-term protection of restored areas, trade-offs associated with forgoing land conversion to agriculture in one location and the potential increase in the demand for farmland and pasture elsewhere (leakage), should also be considered in the analysis and managed (UNEP 2020). Modeling can inform an effective strategy to manage the distribution of benefits and costs to ensure all stakeholders affected by a project are made better off (see Ghermandi and Nunes 2013, Shyamsundar et al. 2022 for examples of applications).

4. EMERGING SOLUTIONS

Now is the time to act - and solutions do exist as market and regulatory dynamics are increasing the potential for recognizing nature's benefits. The fall in supply of ecosystem services coincides with growth in the global population, incomes, and consumption, as well as climate change, and contributes to potentially higher monetary values for ecosystem services.

Monetizing the value of these benefits is key to unlocking wider sources of private investment. This can be achieved in various ways:

- ***Subsidy reform and fiscal incentives*** by the public sector have a large potential leveraging effect for *direct* restoration investments from the private sector. Environmental fiscal policies have been severely underutilized, especially in the land use and forest sectors. While environment-related taxes make up 3–10 percent of total tax revenues in Organisation for Economic Cooperation and Development (OECD) countries, almost all of these taxes relate only to environmental problems caused by fuel combustion (World Bank 2021). Fiscal policies are just starting to be used actively for addressing deforestation and forest degradation, and there is great potential to use them to create incentives for restoration and prevent degradation that would otherwise continue to increase the financing needs for restoration (Ding et al., 2021).

- Since the extent of these markets is still relatively small, governments and the private sector can take steps to develop and deepen ***payment for ecosystem services (PES) programs and markets***, including for carbon storage and sequestration, water provision, and biodiversity credits, which can improve returns (see Box 4).

- ***Other sources of revenue***, such as from ecotourism services and sustainably-produced products, are also on a growth trajectory.[29]

- ***Cost savings and life cycle benefits*** from restoration are being integrated into project finance.

- ***Insurance markets*** can also take steps to better account for increased resilience from restoration, which can result in reduced insurance premiums and ultimately in cost savings.

29 Castro, M. 2022. The secret behind ecological developments that meet new sustainable tourism standards. [Online] Forbes.com Available from: https://www.forbes.com/sites/forbesbusinesscouncil/2022/07/21/the-secret-behind-ecological-developments-that-meet-new-sustainable-tourism-standards/?sh=4df434a87144

BOX 4. PAYMENTS FOR ECOSYSTEM SERVICES (PES)

PES programs provide a potentially scalable source of monetary benefits for restoration (Vincent et al. 2021). PES can be implemented through government-sponsored programs or through compliance and voluntary markets. Under a public PES program, the government pays landholders to undertake actions that increase the supply of ecological services from their land. PES can target restoration of forests that provide non-timber services (e.g., mixed native species forests), which markets do not typically reward landholders to supply, as well as those that provide commercial opportunities (e.g., mixing timber forests and native species). China's Sloping Lands Conservation Program is the leading example of this approach to restoration, as the largest PES program in low- and middle-income countries.

Governments can also develop and implement national PES programs that involve cost sharing with subnational governments or private corporations, as Mexico has done in its Fondos Concurrentes Program (a water provision PES market), and that leverage compliance and voluntary markets. Compliance markets for PES include biodiversity mitigation banks (e.g. the US and Australian markets). Voluntary PES include the rapidly growing Voluntary Carbon Market (VCM) - which reached US$2.5 billion in 2021 - and the forthcoming market for biodiversity uplift credits expected to launch in early 2023. It is estimated that the VCM could grow to US$50-100 billion by 2030. Regulation and guidance frameworks for these markets are under development.

Public, private, and non-profit actors can collaborate to map investment needs and opportunities to appropriate funding sources. For example:

- **Corporations** represent an important potential source for restoration finance through investment in resilient supply chains for food and fiber-based products, (Bancilhon et al., 2018), representing between 1 and 1.5 percent of the total market value of sustainable products in 2020, expected to more than double by 2030 (Deutz et al., 2020);
- **Institutional investors** are looking for opportunities with market returns that are compatible with or contribute to their net zero and sustainability goals and commitments;

- **Impact investors** and **philanthropic finance** give greater weight to environmental and social impacts than traditional investors do, and may be willing to pay for impact; and

- **Public and concessional finance** can be blended with the above listed sources to de-risk or credit enhance.

Corporations represent an important potential source for restoration finance, through investment in sustainable supply chains, which can increase the security and value of supply for the whole value chain (Bancilhon et al., 2018)**.** In 2019, between US$5 billion and US$8 billion per year was being invested into nature through the financing of sustainable supply chains (Deutz et al., 2020), representing between 1 and 1.5 percent of total market value for sustainable products. This is expected to rise to US$12 billion to US$19 billion per year by 2030 (ibid). These numbers are based on financial flows associated with certified forest products, palm oil, agricultural goods, and seafood; they are not specific to any restorative activities potentially involved. As corporates are major landowners and have a significant influence on land through their supply chains, the potential for corporate 'insetting,' rather than - or in addition to - offsetting of carbon or biodiversity impacts is significant.

The implementation of insetting practices is growing. The International Platform for Insetting published a best practice guide earlier this year that helps businesses develop carbon in setting practices.[30]

There is a growing financing opportunity in sustainable value chains driven by demand from companies with large global soft commodity supply chains. Although primarily driven by risk management these investments are delivering direct economic benefits and promote the financial stability of the suppliers. Sustainable supply chain finance markets will reach one third of the market, or US$660 billion by 2030, representing a US$6 billion annual revenue opportunity (Bancilhon et al., 2018). Many business sectors rely directly on ecosystem services for their supply chains. For example, the agriculture sector relies on pollination services, and the textile industry (among many other sectors) relies on sustainable water supply at multiple points across the supply chain (OECD, 2019). Further development of sustainable supply-chains holds the potential for billions of dollars more in annual revenue with the growth of new markets for reduced biodiversity impacts (OECD, 2019). Box 5 provides an example of a sustainable business model in the agricultural sector.

30 The guide is available from: https://www.insettingplatform.com/insetting-guide/

Other benefits may come from accessing new sources of finance (e.g., via ESG investments) and / or lower capital costs (e.g., via sustainability linked instruments). Although this is hard to quantify for businesses that invest in restoration of environments in their value chain, they may be more likely to access concessional finance and avoid delays in receiving permits, licenses, and regular non-concessional finance.

BOX 5: NEW FORESTS

New Forests is a global investment manager of nature-based real assets. New Forests' US$120 million Tropical Asia Forest Fund 2 includes a diversified portfolio of sustainable forest plantation assets in Malaysia, Indonesia, Vietnam, Thailand, Laos, and Cambodia that generates timber, rubber and carbon to be sold to end markets. Alongside its core commercial activities, New Forests manages its investments to implement 18 different impact activities, closely aligned with the Paris Agreement and the UN Sustainable Development Goals, focusing on climate mitigation, biodiversity enhancement, and community development. New Forests' objective with this fund is to demonstrate that asset management that integrates commercial forestry investments with activities like ecosystem restoration, reforestation, and community forestry will lead to better returns, as well as to long-term sustainability outcomes. The fund blends commercial and concessional, impact-oriented equity. "Impact investors are basically getting impact at scale by leveraging the capital commitments of the commercial investors, while the commercial investors have the opportunity to invest in impact at a greater scale than they could with a conventional fund, but are compensated for doing so with impact-oriented investors' equity," says Radha Kuppalli, Managing Director, Impact and Advocacy, at New Forests.[31]

Source: https://newforests.com/

A key challenge in financing restoration is getting capital from large financial institutions and donors to locally-led initiatives. For example, restoration is essential for the mitigation of climate change, yet climate finance adapted for smaller scale restoration is scarce, and social trade-offs associated with larger restoration schemes must be considered (Ding et al., 2017; World Bank Group, 2020).

31 Green Finance Institute. Tropical Asia Forest Fund 2. [Online] Available from https://www.greenfinanceinstitute.co.uk/gfihive/case-studies/tropical-asia-forest-fund-2/

Many of the most impactful restoration interventions are being implemented through small projects led by local actors. Therefore, financing restoration at scale often requires a coalition of investors and donors supporting a consortium of actors implementing a suite of actions on the ground (see Box 6 for an example of a coalition tackling this challenge).[32]

Improving the efficiency and standardization of portfolio management so such financing can be scaled up is critical. Lessons and best practices can be drawn from programs such as Initiative 20x20, AFR100 (see Box 6 for more details), and the Climate Investment Funds Dedicated Grant Mechanism (DGM).

BOX 6: WRI'S AFRICAN FOREST LANDSCAPE RESTORATION INITIATIVE (AFR100)

AFR100 is partnership of 32 African governments and numerous technical and financial partners, aiming to bring 100 million hectares of land in Africa into restoration by 2030. Key goals of AFR100 include catalysing the market for restoration using instruments such as debt, forward contracts, and guarantees, while also playing a broader enabling role through technical assistance, planning and coordination, and monitoring capabilities.

TerraFund for AFR100 was launched in October 2021 with US$15 million of project capital deployed, focusing on local-based restoration efforts with grant finance provided to community non-profits and loan finance (low interest, 4 percent average) provided to agroforestry SMEs. All of TerraFund's projects are tracked for environmental and social impact on WRI's TerraMatch digital platform.

Of the 100 projects that have currently been financed through TerraFund, only a few had access to international finance prior to participation. TerraFund plans to expand its funding pool and cohort in 2023 under a larger financial architecture for AFR100 Phase 2, that will introduce a concessional fund, offtake finance, and carbon credits.

Leveraging lessons learned for small ticket size grants and loans (between US$50,000 and US$500,000), TerraFund will continue to provide finance to private enterprises with viable business models, and grants to community organizations with tailored capacity-building to harness the power of markets to support restoration activities.

Source: https://afr100.org/

32 Sean Dewitt. WRI. Personal communication, September 2022..

These actors can also collaborate on developing investment vehicles which create standardization that enables replication and aggregation to reduce the cost of capital for restoration projects. Standards and labels will be critical to enabling the flow of capital to often small projects. Compared with engineering standards that are used for infrastructure, restoration projects are likely to have more process-focused standards or labels, as by definition restoration will require unique practices which will have a distinct impact in each bioregion.

Equity investment[33] volumes have seen a sharp increase in asset managers creating equity funds that invest in shares of companies improving ecosystem condition through their products or services (see Box 7 for an example).

BOX 7. BNP PARIBAS ECOSYSTEM RESTORATION

This fund invests in listed global equities across the capitalization scale, that offer environmental solutions contributing to the restoration of ecosystems through their products, services, or processes. Investments focus on three main themes: 1) aquatic ecosystems: water pollution control, water treatment and sustainable packaging, aquaculture, efficient irrigation systems and flood control solutions; 2) terrestrial ecosystems: technologies relating to alternative protein, sustainable agriculture, forestry, and plantations; and 3) urban ecosystems: environmental services, green buildings, recycling, waste management, and alternative modes of transport. BNP Paribas Ecosystem Restoration consists of a high-conviction portfolio of 40-60 holdings selected from 1,000 global companies focused on aquatic, terrestrial and urban ecosystem restoration. The investment universe is diversified by geography, size, and sector, with technology, industrials, and materials well represented, and contains many highly innovative companies using complex technologies to address environmental issues. The fund is managed using an active approach that combines macro and fundamental research with proprietary quantitative screening, together with integrated ESG criteria, to identify best-in-class companies.

Source:https://www.bnpparibasfortis.com/newsroom/press-release/bnp-paribas-asset-management-launches-ecosystem-restoration-fund

33 The revenue model of restoration projects is a key determinant of the most appropriate financial instrument. Equity is well-suited to projects with revenues expected in the medium to long-term. Loans and bonds are suitable to projects that have revenues from the start, with bonds also more suitable for larger projects (greater than US$50 million) given the upfront transactions costs to set up the arrangements. Grants are suitable for projects with lower or uncertain revenue streams. Crowdfunding can be mobilized as either grants or loans.

These funds often spread their investments across companies active across the whole restorative continuum and whose activities include practices that reduce societal impacts and those that directly create a net gains in ecosystem functions. Equity investment can be either on concessional terms or at market rates. A key example is provided by natural asset companies that maximize the flow of ecosystem services from natural or production ecosystems to which they have both the rights and authority to manage and convert into financial capital. The public sector can provide the founding equity for such companies, reducing risks for private investors and potentially providing capital returns for the public purse. For example, the world-leading Costa Rican National Bioeconomy Strategy (2020)[34] includes such measures.

Debt instruments are also showing potential to support and scale restoration financing. Bonds are fixed-income debt instruments that represent a loan made by an investor to a borrower (typically corporate or governmental). Bonds have the potential to be significantly scaled both as standalone financial instruments, and as part of blended finance described below. In particular, green bonds are a category of fixed-income securities raising capital for projects with environmental benefits. Most green bonds are not used to channel funds into restoration projects at the moment, but there is scope for this tool to be used as a source of financing. The Forest Resilience Bond (Box 8) is a public/private partnership developed by Blue Forest Conservation and the World Resources Institute which illustrates this approach.

BOX 8. FOREST RESILIENCE BOND

The FRB Yuba Project I LLC, or the Forest Resilience Bond (FRB), is a financing mechanism developed by Blue Forest Conservation in partnership with the World Resources Institute (WRI). The FRB raises private capital to fund the upfront costs of forest restoration. Multiple beneficiaries of restoration, including the US Forest Service, State of California, and Yuba Water Agency, will share in the cost of reimbursing investors over time. Investments through the FRB support forest restoration using ecologically-based tree thinning, meadow restoration, prescribed burning, and invasive species management—all specifically designed to reduce the risk of severe fire, improve watershed health, and protect water resources.

Source: https://www.blueforest.org/forest-resilience-bond

34 UN. 2020. Costa Rica launches National Bioeconomy Strategy. [Online] Cepal website. Available from: https://www.cepal.org/en/notes/costa-rica-launches-national-bioeconomy-strategy

Addressing risks will be an important driver for unlocking significant private capital. As noted, most monetary benefits from restoration projects do not always generate a high enough risk-adjusted revenue stream to attract private debt and equity finance. Upstream analytical work on capturing the financial value of these activities, along with policy shifts requiring payment for those values, will be critical. Grants – both standalone and in blended finance models - are likely to be needed until there are broader systematic shifts in policies and incentives that make debt and equity financing more attractive or feasible (see Box 9 for a fund using de-risking instruments in the agriculture sector).

BOX 9. RABOBANK AGRI3 FUND

The AGRI3 Fund enables commercial and development banks to take a leading role in kicking off the transition to more sustainable agriculture. The Fund offers banks guarantees to partly de-risk projects, the ability to offer longer tenors, and provide grant money for technical assistance. The Fund is part of a Rabobank and UN Environment Partnership, which was launched in 2017 to unlock US$1 billion in capital for the transition towards sustainable agriculture. The Fund provides de-risking financial instruments and tailor-made technical assistance to enable the transition towards Integrated Crop-Livestock-Forest (ICLF) systems.

Source: https://agri3.com/about/

Grants, which may comprise a portion of blended finance, are provided by the public and philanthropic sector for a range of restorative projects. Historically, most of the funding for forest and landscape restoration has been provided by national environmental grants, development cooperation, and climate finance streams (FAO and UNCCD, 2015). NbS funding analysis (UNEP, 2021b) indicates that national grant schemes fund most of the restoration and conservation projects, while the total volumes of funding from development cooperation or philanthropy is relatively small. Climate finance has provided the biggest volume of development cooperation finance; REDD+ donor countries have pledged more than US$4 billion[35] in results for payments grants to support emission reduction forest protection and restoration programmes in about 50 partner countries.

35 Norway's International Climate and Forest Initiative – Evaluating for Success. 2020. [Online] OECD website. Available from: https://www.oecd.org/dac/evaluation/Norad-Factsheet-interactive-final.pdf

BOX 10. WORLD BANK ETHIOPIA LANDSCAPE MANAGEMENT PROGRAM

The World Bank's decade-long program in Ethiopia brought around 900,000 hectares of land under sustainable land management practices and benefitted 2.5 million people. Two projects within the program treated more than 860,000 hectares of degraded landscapes in 1,820 micro watersheds, supporting agroforestry activities and effecting area closures to limit free grazing. This led to a 5.2 percent increase in vegetation cover and moisture retention in the targeted watersheds. The program also supported the issuance of landholding certificates, benefiting smallholder farmers and landless youth. Integrated watershed and landscape management, and the conservation and restoration of degraded land were implemented to raise land productivity.

Source: https://www.worldbank.org/en/news/immersive-story/2020/05/21/investing-in-nature-pays-off-for-people-and-biodiversity

Blended finance is a vital tool to leverage private investment in restoration (Sarabi et al., 2020; Girardin et al., 2021). Blended finance refers to the mixing of finance from multiple sectors using a range of vehicles in an investment model that reduces risks and smooths capital returns to overcome outcomes time lags. It often involves a mixture of public, philanthropic, and private investors, which have a crucial role to play in the early development of markets and market blueprints. It is likely to be an important investment approach in closing the finance gap, as a high proportion and volume of public or private benefits from restoration will remain non-monetizable in the foreseeable future.

Blended finance investment vehicles are used in various combinations. These include concessional capital, guarantees, grants, market rate debt or equity, junior equity,[36] flexible term loans, results-based transfer[37] and technical assistance facilities. Financial risk mitigation tools employed in blended finance for restoration to account for environmental political and social risks include re-insurance, parametric insurance, and bonds.

Disaster risk avoided through restoration translates to lower insurance pay-outs, which can be monetized in lower premiums and lead to further innovative restoration investment mechanisms.

36 Subordinate to other stocks issued by an entity and will be paid out last in a liquidation scenario.

37 Results-based financing includes a range of financing mechanisms where financing is linked and provided after the delivery of pre-agreed and verified results, including output-based aid, impact bonds, indicator-linked loan disbursements, and results-based climate mitigation or adaptation. The World Bank hosts an e-learning portal https://www.gprba.org/knowledge/e-learning-results-based-financing-approaches-key-concepts-principles

For example, evidence for the Western United States shows a 41 percent reduction in residential insurance premium when ecological forestry management, including thinning and prescribed burning, is applied (Willis Towers Watson and TNC, 2021). The Coalition for Climate Resilient Investment is developing a set of 'Systemic Resilience Metrics' which aims to enable better integration of physical climate risk into infrastructure investment decision-making. These metrics are designed to be used by governments, credit rating agencies, institutional investors, commercial banks, MDBs, and international organizations. The metrics will support the restoration investment case by demonstrating the financial benefits of NbS.

Insurance is an emerging source of funding for restorative NbS for natural disaster resilience and climate adaptation, which reduce risk for built infrastructure and populations. It has the potential to scale significantly although more work needs to be done to verify cost-benefit ratios of different NbS and reduce outcomes uncertainty, as well as to develop the market models for monetizing avoided losses (World Bank 2022). Insurance mechanisms implemented thus far use parametric risk models to support a range of NbS (see Box 11), which could be adapted to support large-scale restoration. Underwriting models and policy recommendations are currently under development that can be adopted by the insurance industry, policymakers, and regulators, and that will enable the inclusion of the value of natural assets in insurance policies (Earth Security n.d).

BOX 11. USING PARAMETRIC RISK MODELS TO SUPPORT NBS

A hurricane risk model for coral reefs was developed by Willis Towers Watson for the Mesoamerican Reef (MAR), to underpin a parametric insurance program that supports recovery of the MAR after a hurricane. The model itself leverages the techniques applied in estimating the probability of damage in the built environment by looking at the coral reef's hazard, exposure, and vulnerability to define the probability of damage from hurricanes of different magnitudes. Such an analysis quantifies, for example, the likelihood of a tropical cyclone hitting a specific section of the reef and the loss that the reef would sustain, to provide an estimate of damage per hectare.

Combining ecological action with financial protection can make good economic and financial sense and help overcome the pricing issues associated with risks such as wildfire. For example, an ecological forestry approach linked to parametric wildfire losses could reduce losses for the insurance and reinsurance sector. A study by The Nature Conservancy (TNC) and Willis Towers Watson found a 41 percent reduction in residential insurance premiums was possible when ecological forestry techniques such as forest thinning and prescribed burning were applied to a relevant area. Without such ecological measures, the risk of wildfire continues to grow.

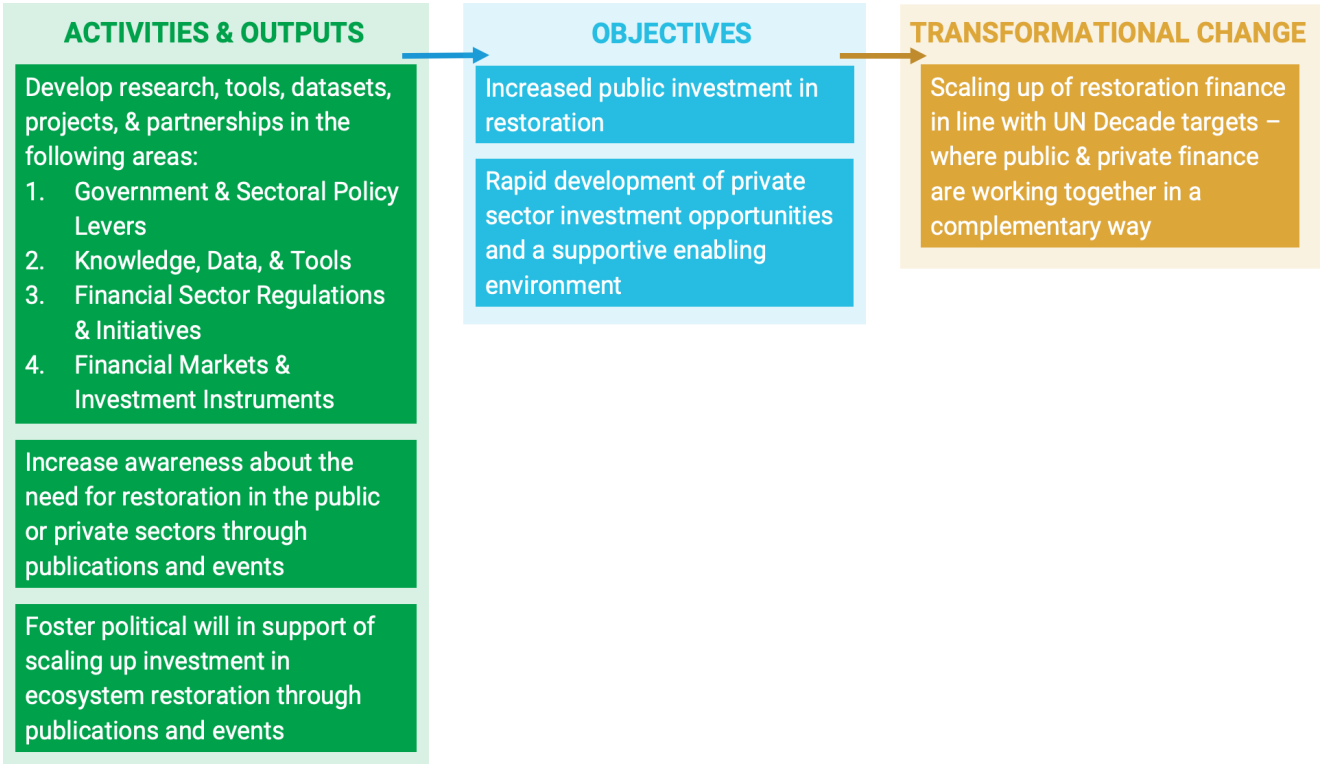
Source: https://www.financialprotectionforum.org/publication/insuring-natures-survival-the-role-of-insurance-in-meeting-the-financial-need-to

Paulose NK/ Shutterstock

5. FINANCE TASK FORCE ROADMAP

Based on the challenges and emerging solutions outlined in this stock take, the FTF will coordinate catalytical research, tools, datasets, projects, and partnerships, and take steps to increase awareness and foster political will in the public or private sectors in support of scaling up investment in ecosystem restoration. Rapid development of investment opportunities and their enabling environment is required to scale up restoration finance to the degree necessary to manage public and business risk, meet sustainable development goals, and realize business or investor opportunities. Based on this Stock Take report, the FTF has identified the following theory of change and actions needed to scale restoration finance sufficient to meet the UN Decade's goals.

BELOW Figure 4: FTF Theory of Change



RIGHT Table 1: FTF Roadmap Pillars (to be further developed)

To address the challenges identified, the TF identified the following key pillars of work: 1) Government/sectoral policy levers; 2) Knowledge, data, and tools; 3) Financial sector regulations and initiatives (taxonomies etc.); and 4) Financial markets and instruments to mobilize private finance. These priorities areas will form the basis for the Roadmap of the FT through 2030, as outlined in the following table, to be further developed. The FTF will kick off the agenda for each Pillar with a workshop to identify key topics and partners.

PILLARS	FTF OUTPUTS	PARTNER OUTPUTS
PILLAR 1: GOVERNMENT AND SECTORAL POLICY LEVERS	• Identification and promotion of relevant work by partners	• Research on how to create a supportive enabling environment for restoration • Case studies on successful subsidy reform/ PES programs, frameworks, or regulation • Case studies on successful landscape-scale integrated planning
PILLAR 2: KNOWLEDGE, DATA, AND TOOLS	• Taxonomy of restoration activities • Restoration cost/ benefit database, analytics, tools, and training • Restoration trade-offs assessment guide	• Presentation of key restoration data sets to a group of relevant private sector actors and collect feedback on additional data needs • Tracking and analysis of restoration investment flows • Approach for integrating credits for co-benefits with carbon credits (i.e. biodiversity, water, etc.) • Publications, guidance, and/or support for countries and the private sector on natural capital accounting
PILLAR 3: FINANCIAL SECTOR REGULATION AND INITIATIVES	• Review of key financial sector regulation, guidance, and analytical tools to ensure restoration is appropriately accounted for (i.e. taxonomies, credit rating methodologies, risk assessment approaches, etc.)	• Workshops exploring how to better integrate restoration into financial sector regulation, guidance, and analytical tools • Analytical papers assessing potential to better integrate restoration
PILLAR 4: FINANCIAL MARKETS AND INVESTMENT INSTRUMENTS	• Templates for replicable or scalable investment structures (typology of restoration investments) • Publication assessing Monitoring, Reporting and Verification (MRV) cost reduction trends and barriers	• Case studies showcasing restoration investment and regenerative business models • Provide input or technical assistance to investment platforms • Support standardization of investment contracts • Standards/label for NbS projects – building on FAST Infra's Sustainable Infrastructure Label • Cooperation with the UN Decade Best Practices Task Force to implement the Capacity, Knowledge and Learning Action Plan • Guidance to UN Decade partners leading Restoration Challenge for Finance

5.1. GOVERNMENT AND SECTORAL POLICY LEVERS

To make restoration initiatives investment-ready, or 'bankable', creating a supportive policy environment is crucial. All sectors, including government, multi- and bilateral organizations, the private sector, and NGOs, need to collaborate to create a governance conducive to investment in restoration (Gheyssens et al., 2020). While the roles and responsibilities of MoFs differ across countries, they all control levers that can make a significant contribution to reducing and reversing nature loss. A supportive policy environment for restoration investment will include the following:

- **Policies and stakeholder objectives need to be aligned at different levels.** Policies that are unaligned between sectors can be a barrier for achieving restoration objectives, with adverse incentives and a mismatch between short- and long-term ecological and economic goals often in play. Specific legislation to initiate and sustain restoration programs is often lacking, or poorly understood. Barriers frequently include policy misalignment between sectors or arms of government; legal and institutional frameworks unsuited to long-term governance or multiple owners and beneficiaries; low levels of dedicated capacity; insufficient coordination between actors on land-use planning; and underdeveloped financial risk mitigation or adaptive management strategies. Key to improving alignment between policies and stakeholders is the establishment of national and sub-national targets for restoration that are clearly stated and understood.

- **Fiscal policies need to be geared towards creating positive incentives for those involved in restoration activities.** As outlined by the Coalition of Finance Ministers for Climate Action, MoFs can support environmental fiscal reform through assessing and raising awareness of the nature-related risks associated with harmful subsidies and offering recommendations on phasing out these subsidies (Power et al 2022). In addition, the integration of the value of nature in decision-making can be supported through incentives or enabling mechanisms such as environmental taxes; tradable permits; payments for ecosystem services programs; circular economy solutions; debt for nature swaps; and providing blended finance. National nature investment plans, the provision of data, modelling and decision support tools for private sector actors are also key. Research is needed on what the key characteristics are that allow certain

results-based payment schemes to work - for example measurable and financially quantifiable benefits (i.e., there is an agreed upon market price), clear roles for those undertaking the action and those receiving the benefit to enable payment flows, and the ability to track actions.

- **Clear land tenure, benefit-sharing, public participation, and safeguard policies are necessary elements of achieving impact from restoration interventions**. Tenure security is a major challenge for restoration programs in many countries. In areas slated for restoration, there may be existing claims on land, overlapping tenure systems, or insufficient data and information to clarify tenure rights. Because of the levels of investment and returns involved, as well as the possibilities for failed or perverse outcomes, laws and regulations are required on specific issues such as land tenure, resource management, environmental and social impact assessments, access to information and grievance redress mechanisms. In some contexts mechanisms such as Common Asset Trusts (CATs) can also be considered for the management of common pool resources.[38]

- **The necessary data should be provided.** MoFs (together with other relevant ministries and agencies) can use evolving geospatial, artificial intelligence, machine learning, and environmental DNA technology to support the implementation of natural capital accounting (NCA) practices. They also need to ensure this information is integrated into national accounts to be considered in budgeting, policy, and planning alongside other economic information to ensure effective 'asset management' of all forms of a nation's capital (Power et al 2022). Macroeconomic and financial modeling could give MoFs information on the fiscal implications of nature loss, and enable evaluation of potential tradeoffs and complementarities of different nature-related policy instruments (ibid). A greater awareness of the economic benefits of natural capital, shared among ministries of environment, agriculture, finance, and other sectors, would lead to greater public funding and the creation of economic incentives for restoration.

With better systems of natural capital accounting in place, ministries of finance can leverage cross-government opportunities to incentivize better

38 Common Asset Trusts (CATs) to allow for mixed private and community property rights. Costanza et al. (2021) propose the use of CATs to build investment portfolios of wetlands because they meet the needs of multiple investors, permit bundled payments, and provide flexibility to invest in the restoration of numerous services/values, all using a coordinated, and transparent process.

management of nature-related risks. Adoption of natural capital accounting based on the UN System of Environmental - Economic Accounting (SEEA) framework would assist building whole-of-government investment cases and coordination.

- **Market aggregation of projects at the landscape level must be established to attract investments at scale.** Many restoration projects are small, often pilot projects, not sufficiently large to be attractive to institutional investors. Several examples[39] suggest a landscape approach could be the basis for making investments in restoration more suitable to large financial actors. There is a need to link restoration activities to large-scale landscape visions and planning processes (Mansourian, 2016). Such planning exercises should involve all relevant stakeholders and facilitate dialogue over trade-offs and synergies. Landscape restoration planning and implementation processes must also be empowered by higher levels of government, informed by scientific data and local knowledge, and inclusive of all stakeholders in target landscapes.

- **While policy issues are beyond the scope – and capacity – of the FTF, the group will work with partners, including other UN Decade Taskforces, to raise awareness of these issues, and highlight the supporting policy environment needed to scale restoration finance.**

5.2. KNOWLEDGE, DATA AND TOOLS

Vastly improved knowledge and data resources on what restoration interventions work where, with which co-benefits, on what timescales ,and at what cost effectiveness are required to scale up finance. As with monitoring of restoration finance flows, there is to date a lack of systematic data on restoration costs to enable reliable estimates at the project or investment scale. This can limit investment and investor confidence, as well as optimization based on cost-benefit analyses. In emerging markets, where reforestation, afforestation, and sustainable forest management is most needed, the lack of data deepens investors' concerns around natural disasters such as fires, and reputational risks resulting from potential negative social and environmental impacts. Restoration can be considered especially risky when there is no investment track record. Large cost uncertainties remain for many ecosystems and restorative interventions or goals.

39 Examples include Indonesia's Ecosystem Restoration Concession (ERC), a 'market-oriented governmental instrument to incentivize private sector investment in restoration' – restricted to lands designated as production forests. Brazil's Atlantic Forest Restoration Pact, and the Landscapes for 1 Billion Partnership

BOX 12. SE.PLAN TOOL TO ASSESS RESTORATION SUITABILITY

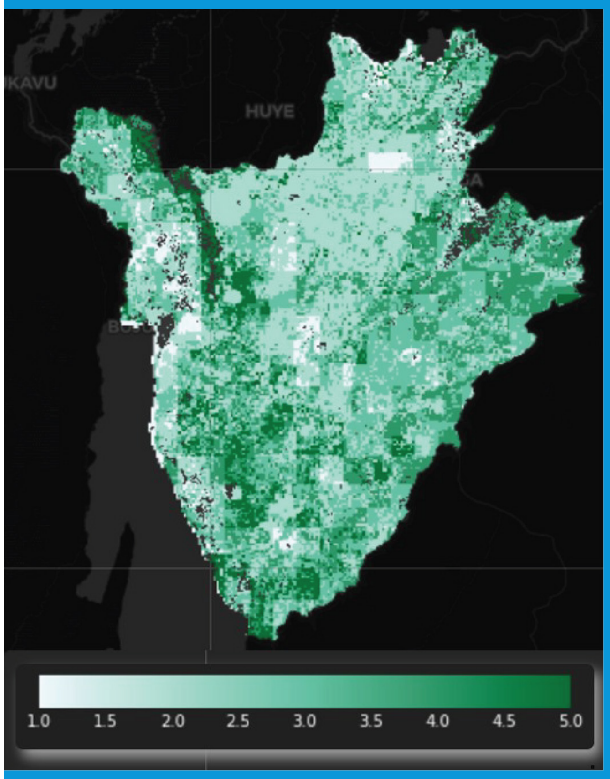


Figure-Box 12: Restoration benefits-cost ratio for Burundi

Source: https://docs.sepal.io/en/latest/modules/dwn/seplan.html?highlight=se.plan

Developed by UN FAO, Spatial Informatics Group (SIG), Duke University, Peking University, SilvaCarbon with support from the Government of Japan, the Se.plan online tool identifies areas where forest restoration is economically suitable for low and middle income countries. The tool uses publicly available high-resolution data to identify locations where the benefits of forest restoration (biodiversity conservation, carbon sequestration, local livelihoods, and wood production) are high relative to restoration implementation or opportunity costs, subject to biophysical and socioeconomic constraints that users select. "Figure-Box 12: Restoration benefits-cost ratio for Burundi" illustrates areas with low to high restoration suitability in Burundi under a specific set of constraints (darker green indicates higher benefit-cost ratio).

Several initiatives are running to fill this gap and more effort and coordination in this field is an urgent need. Better access to spatial planning and decision-making tools which can visualize landscapes and model cost-benefit scenarios is vital for investment due diligence, decision-making, and assurance.[40] Extrapolation of small scale information on restoration costs per ecosystem can provide estimates for large scale restoration targets (Groot et al., 2013). For example, the Society for Ecological Restoration is leading a comprehensive assessment of restoration costs per ecosystem type, with a first release expected in late 2022.[41]

40 The well-established Forest Landscape Restoration programme has shown the quality and availability of data on costs and benefits – both for market and non-market values – to be a limiting factor for attracting the potential range and volume of investors (FAO and UNCCD, 2015).

41 Bethanie Walder, SER Executive Director, Personal Communication

The Economics for Ecosystem Restoration (TEER) initiative is building a database/ clearing house of cost information linked to benefits information from the Ecosystem Service Valuation Database, with a first release also scheduled for late 2022.[42] A partnership between UN FAO, Spatial Informatics Group (SIG), Duke University, Peking University and SilvaCarbon has developed an online tool to provide cost and benefits data for restoration intervention planning at high resolution (see Box 12 above).

More work is required to develop universally comparable biodiversity metrics and increase the accuracy of ecosystem service valuation. Data sources, metrics, and tools to measure or build valuation models for natural capital (the biodiversity 'stocks' and ecosystem services 'flows') are now available at low-resolution global level and can be tailored to specific regions and services of interest.[43] However, because nature dynamics are complex, nonlinear, and at times unpredictable, the prevailing data gaps still pose modeling challenges that require further research. In addition to further development of the data and tools, there is a need for intermediaries and information service providers to provide analytics to investors and planners on where and how the highest returns for desired benefits can be achieved for the lowest costs (e.g., biodiversity gain, carbon sequestration, climate adaptation). Nature-related disclosures and standards are lagging in data and metrics development.

Better knowledge of likely restoration success in supplying benefits is also required. Evaluating net benefits of restoration is dependent on many factors - including stakeholders' valuation of benefits, restoration intervention costs, and the opportunity costs of any natural resource use or production displaced by the restoration. Multi-criteria analysis tools for transparently evaluating trade-offs among potential benefits[44] are required at scales relevant to ecological conditions and beneficiary needs.[45] Better data and analytical tools can also inform how landscape restoration and strategies to empower local stakeholders and tackle

42 Luke Brander. Personal Communication

43 For example, the ENCORE risk explorer tool biodiversity module, the eBio Atlas; IUCN Species Threat Abatement and Restoration (STAR) metric, the GLOBIO database, the Biodiversity Intactness Index, and the ARIES for SEEA natural capital accounts tool, the ISO 14008:2019 methodological framework for Monetary Valuation of Environmental Impacts, the Ecosystem Services Valuation Database.

44 For example, biodiversity enhancement versus certain provisioning ecosystem service flows, or among ecosystem services.

45 Trade-off analysis tools should incorporate risk and sensitivity analyses; for example, forgoing land conversion to agriculture in one place has the potential to increase the demand for farmland and pasture elsewhere (leakage) (UNEP, 2020), and climate change may affect success (Von Holle et al., 2020). The UNDP analyzed 45 toolkits to identify best practices in cost-benefit analysis for NbS in Latin America and the Caribbean and published a report which provides guidance to identify the full range of social, economic, and environmental benefits and costs resulting from NbS. The report is available from: https://cssh.northeastern.edu/policyschool/ wp-content/uploads/sites/2/2021/07/Northeastern-NbS-report-final.pdf

gender disparities can reinforce each other. The UN Decade Framework for Ecosystem Restoration Monitoring (FERM), led by the Monitoring Task Force and launched at the World Forestry Congress 2022 will make an important contribution to outcomes information through the systematic measurement of over 70 consultative and analytical indicators covering a range of SDG targets.

Governments, and MoFs in particular, can play a key role as data providers. They can ensure that national NCA data is accessible to the public and in a geospatial format that can be disaggregated by administrative region (Power et al, 2022). This will allow subnational governments and the private sector to consider this information in their planning, operations, and decision-making. Additionally, it will allow citizens to ensure good environmental quality in their communities. MoFs, statistics offices, ministries of environment, and central banks might jointly develop a national data hub that provides NCA data in a usable format for financial institutions that need to use this information to better understand and manage their nature-related risk exposure and risk management opportunities (ibid).

There is also a need for better tracking and quantifying financial flows investing in restoration. The following challenges will need to be overcome to achieve this:

- Restoration goals built into climate and nature finance tracking.
- Sustainable taxonomies and disclosure standards extended to eligible restoration activities.
- Collection of data on investment flows (ideally distinguishing active/passive restoration).
- Integrated reporting as a framework for company reporting on the balance of physical, human, and natural capital.
- Corporate standards, targets, disclosure, and product labelling for food/clothes/consumer goods companies
- Nested standards on NbS and ecological restoration: existing frameworks provide good principles and indicators for successful NbS (where the information does not meet the needs of investors)

The development and provision of information on restoration costs, benefits, business models, and best practices is critical to scaling investment in restoration. This information is needed to make a compelling investment case to the range of different actors, including governments, that can contribute to restoration.

Cost and benefit data should be as localized as possible – providing information specific to countries and bioregions. There is a critical need for this data for low- and middle-income countries, where the need for restoration investment is greatest and costs tend to be lower. Tools that enable governments, investors, and project developers to apply this data and analytics that map out investment opportunities could help support restoration investment. The World Bank's analysis of the costs and benefits of large-scale mangrove restoration in Indonesia provides an example for how this could be approached (World Bank 2002b). Analysis of benefits should apply a broad lens to provide a holistic picture of the impact of restoration and may include granular data and local knowledge, including from indigenous peoples and local communities. Additionally, there is a need to develop case studies demonstrating business models and best practices for developing bankable restoration projects that generate positive economic and environmental impacts.[46]

A key focus of the FTF will be on improving restoration data and analytics. This will include supporting the development and standardization of cost benefit methodologies, coordinating data initiatives, and making data sets available for investment analysis by the corporate and financial sectors.

5.3. FINANCIAL SECTOR REGULATIONS & INITIATIVES

A taxonomy of restoration activities can help identify – and ultimately scale - appropriate financing approaches. Restoration involves a wide range of activities, including agroforestry, silvopasture, reforestation, mixed species plantations, riverbank restoration, natural regeneration, assisted natural regeneration, and farmer-managed natural regeneration.[47] While there are many actions that can be taken to improve the economics of restoration across the full spectrum of restoration activities, financing approaches, standards, and best practices need to be developed for each category of restoration activities. An agreed-upon taxonomy of restoration activities can better enable this. Projects and businesses operating in each category can then be aggregated together within a given geography to increase the size of investment, diversify risk, and reduce the cost of capital.

46 An example is WFF's Bankable Nature Solutions report. Available at https://wwf.panda.org/discover/our_focus/finance/bankable_nature_solutions/

47 All forms of regeneration should use native species where possible.

Ecosystem restoration is not currently distinct in emerging sustainable finance taxonomies and reporting frameworks.[48] For example, the EU Taxonomy lumps ecosystem restoration with nature protection, and does not subdivide climate mitigation or adaptation activities to identify the contributions of ecosystem restoration. MDBs have since 2015 issued joint Common Principles for Climate Mitigation Finance Tracking[49] and CBI issues a detailed, sector- based taxonomy[50] to complement its Climate Bonds Standard – but similarly these do not identify when restoration has been an outcome. Likewise, the Green Bond Principles framework

(assessed by a range of standards) and non-financial reporting frameworks like the Sustainability Accounting Standards Board (SASB) and the GRI (the Global Reporting Initiative) do not provide the basis for tracking restoration finance volumes. If the UNFCCC were to provide guidelines for NbS accounting, then NDCs could be important reporting sources for restoration investments.

Developing standards for nature-related reporting should ensure that opportunities for restoration activities and restoration co-benefits are identified and disclosed by companies so that investors can assess and engage with companies on these criteria. The Task force for Nature-related Financial Disclosures' (TNFD) Beta Release (V2) in June 2022 builds on the success of the TCFD and is complementary to ISSB work on nature reporting. The framework is widely expected to transform private sector motivation to reduce nature impacts, and to focus on ecological restoration as a competitive way of attracting investors seeking low nature impact and dependency risks.[51]

The restoration finance sector can also benefit from support to companies and investors to use emerging frameworks to evaluate and report on their nature-related risks and dependencies, and to set targets toward regeneration.

48 The eight broad categories of the IUCN Global Ecosystem Typology (IUCN, 2020) can be used as a base taxonomy to describe restoration interventions: farmlands; forests; freshwater; grasslands, shrublands and savannahs; mountains; oceans and coasts; peatlands; and urban areas.

49 The report Common Principles for Climate Mitigation Finance Tracking, published in 2021 is available from: https://www.eib.org/attachments/documents/mdb_idfc_mitigation_common_principles_en.pdf

50 The Climate Bonds Initiative (CBI) taxonomy is available from: https://www.climatebonds.net/standard/taxonomy

51 To support the testing and implementation of the TNFD, the Agence Française de Développement (AFD) will lead and convene a 'Development Finance Hub' to convene and coordinate the global public development finance contribution to the TNFD.

Nature-related risks, dependencies and impacts are increasingly being applied to investment and business models as a lens to assess their environmental and social performance and risk profile.[52] Several finance sector working groups are focusing their attention on the mainstreaming agenda, which aims to include impacts and dependencies on nature more upstream in the investment-deal process, and work towards aligning total institutional impact with societal goals.This includes the Network for Greening the Financial System (NGFS) – made up of banks and financial sector regulators.[53] MDBs[54] and national development banks are also playing a key mainstreaming role.[55]

The FTF will work with partners leading these initiatives to ensure restoration is fully incorporated and supported by the developing international sustainable finance regulatory architecture.

5.4. FINANCIAL MARKETS AND INVESTMENT INSTRUMENTS

Blended finance instruments have the greatest potential to scale up private restoration finance in the near term. Priority actions enabling this potential to be realised involve: i) supporting and duplicating innovative blended models to suit a range of programmes, risks and benefits, and counterparties, and ii) creating market intelligence platforms to bring different investor counterparties together to make deals. Existing examples that could be scaled include sustainable forestry funds with mixed equity and debt investment from a variety of investor sectors including

52 There is an increasing shareholder, market, and regulatory push for companies to understand their whole value chain. Technological advances such as blockchain are making full supply chain transparency increasingly feasible

53 NGFS issued a statement in March 2022 following the completion of work by the Study Group on 'biodiversity and financial stability' underlining the significant macroeconomic implications that could result if nature-related financial risks are not fully accounted, mitigated, and adapted for. They recommend following key action areas for central banks and supervisors to address biodiversity-related financial risks: build capacity for scenario analysis and stress-tests; develop supervisory expectations for financial institutions' governance, risk management, strategy, disclosure, and financial conduct and consider monetary policy operations and non-monetary policy portfolio management. The group has signaled the need for forward-looking economic models to capture to physical and transitional risks of assets and lending and some central banks have already incorporated climate risk exposure exclusion frameworks or are creating preferential terms for green lending. The statement is available from: https://www.ngfs.net/sites/default/files/medias/documents/central_banking_and_supervision_in_the_biosphere

54 The MDB Joint Statement, released in 2021, is available from: https://ukcop26.org/mdb-joint-climate-statement/

55 Finance for Biodiversity research (F4B, 2021b) shows G20 countries' collective stakes in development banks are worth nearly USD 7 trillion, and that they collectively have the majority of board votes in seven out of the eight largest multilateral development banks.

philanthropy[56] and public[57] seed money; sustainable agriculture funds that are de-risked through guarantees and subordinated loans and provided technical assistance by donors; or grants providing concessional loans and equity that restoration projects or natural asset companies can leverage upon to gain private equity investors.[58] [59]

In addition to the creation of blended finance instruments, scaling potential can be derived from dedicated entities which facilitate joint ventures that underpin such instruments, or which actively seek to aggregate and blend finance to support an investment portfolio. For example, Earth Security builds joint ventures with companies, investors, and governments for mangrove restoration, including many examples of subnational investments using different investment structures – insurance, bonds, impact funds etc. The U.S. private company Quantified Ventures have blended carbon credits income with public regional conservation money to plant more than 1 million trees (U.S. Government, n.d.).

Improved market platforms are needed, to verify, aggregate, and deliver nature-related investment opportunities. Rapid developments are taking place in investment models, business models, funding pipelines, and blueprints for restoration projects. Some key innovations include the NbS workstream of HSBC Climate Solutions Partnership, the Coalition for Private Investments in Conservation (CPIC) investment blueprints, and the Intrinsic Exchange Group's collaboration with the New York Stock Exchange to link natural asset transactions to capital markets. Critical to the development of aggregation facilities is sustainable labelling (and supporting data) to identify qualifying projects (such as that provided by the FAST Infra label for natural infrastructure projects).[60] Some carbon offset certifying bodies such as Plan Vivo[61] already provide standards that enable the aggregation of smaller projects to enable them to access the carbon market.

56 E.g., the US$100 million Terraformation and Bankers without Boundaries sustainable forestry fund will target both debt and equity investors as well as philanthropic capital.

57 World Bank's Multilateral BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL) establishes partnerships between several countries and the private sector to reduce AFOLU GHG emissions with silvopastoral and other regenerative agriculture methods.

58 As an example, Mirova's Nature+ Accelerator Fund released in March 2022 its first request for proposals which deploys initial GEF grant to offer concessional finance.

59 De-risking through blended finance will introduce new investors and demonstrate commercial viability of investment so blended finance can be phased out over time (Apampa et al. 2021).

60 FAST-Infra Platform participants are IBM, SIF-SOURCE, Scale, EPPF, InfraClear, Liquidnet, Refinitiv, Hitachi, Standard Chartered and HSBC. More information is available from: https://www.climatepolicyinitiative.org/fast-infra-platform/

61 More information about Plan Vivo is available from https://www.planvivo.org/

Scaling up of restorative NbS finance is a key opportunity, with consistent classifications in capital markets needed to create the asset class. NbS have a significant role to play in solving multiple global challenges, including climate change mitigation, biodiversity loss, desertification, disaster resilience, climate change adaptation, food and water security, human development, and health issues. Private sector NbS finance has been most associated with voluntary carbon markets and sustainable supply chains, but other investment categories include thematic private equity impact investment funds, co-finance for development banks and public climate funds, and payments for ecosystem services. Because of the broad nature of restorative NbS benefits, funding of interventions is well-suited to blended finance that enable multiple stakeholders and investors to share risks and benefits. To support scaling up public sector funding of NbS as solutions to climate adaptation and disaster risk reduction, the Global Program on NbS for Climate Resilience, housed and funded by the Global Facility for Disaster Reduction and Recovery (GFDRR), is developing targeted knowledge and tools to leverage the voluntary carbon market to fund NbS for climate resilience projects.

A consistent classification of NbS in capital markets will help to create the asset class (Swann et al 2021). A variety of definitions and disclosure frameworks are being developed (see scaling priority 1) that can contribute to NbS market classification.

Improving Voluntary Carbon Market (VCM) co-benefits measurement, standardization, and pricing should increase private investment flows into climate mitigation NbS. The Integrity Council for Voluntary Carbon Markets will produce core carbon principles to set a framework for co-benefit accounting that the Task Force for Voluntary Carbon Markets will implement. While voluntary carbon markets provide immediate scaling potential due to the demand for premium offsets with co-benefits, improvements in co-benefit considerations of regulatory markets would also increase investments into restorative climate mitigation activities.

The FTF will work with partners to develop the biodiversity credit markets which can unlock restoration financing. The Taskforce will also showcase emerging good practices in blended finance and restorative NBS.

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