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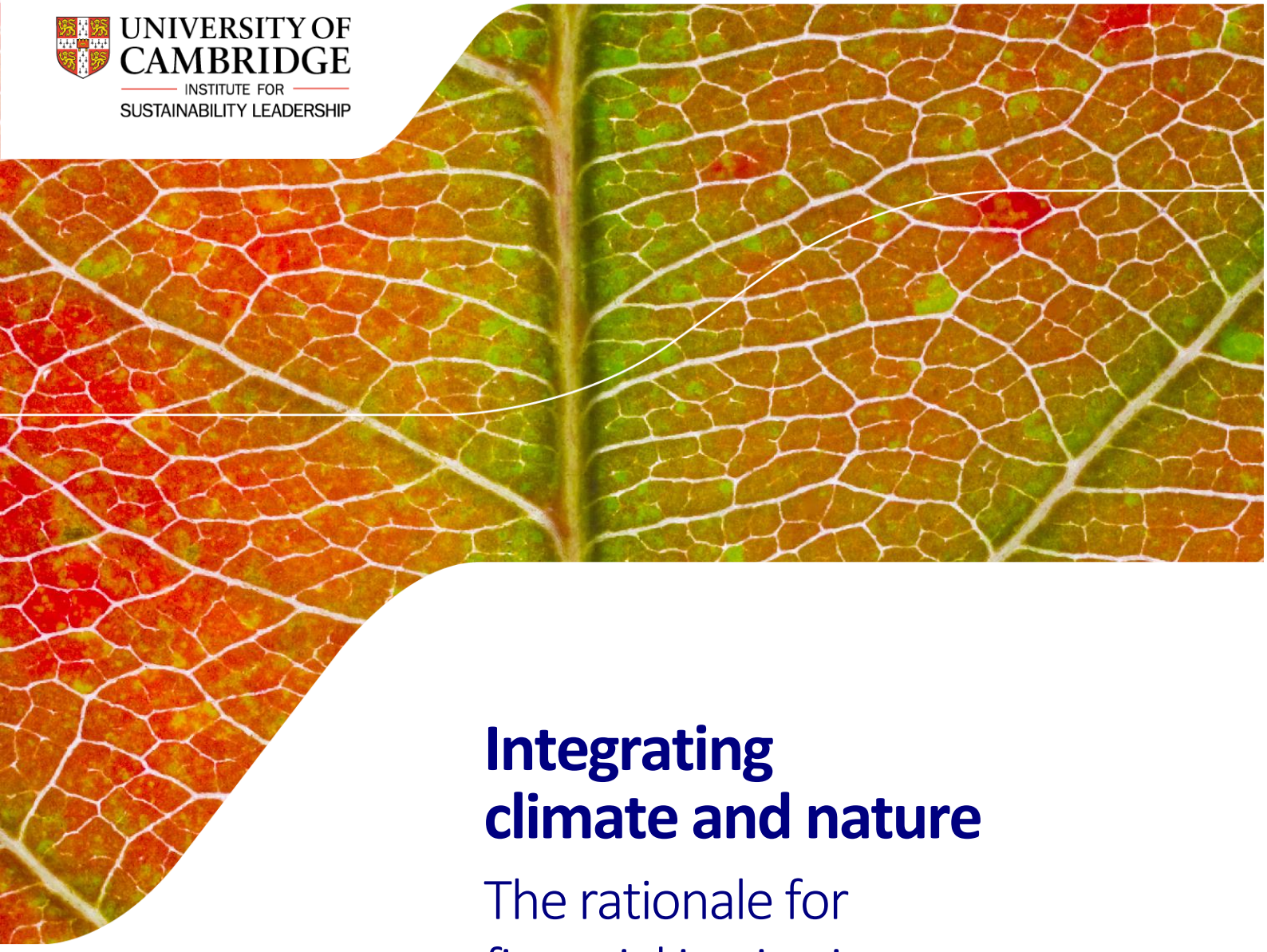

Integrating climate and nature

The rationale for financial institutions

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Citing this report

University of Cambridge Institute for Sustainability Leadership (CISL). (2022). *Integrating climate and nature: the rationale for financial institutions*. Cambridge, UK: University of Cambridge Institute for Sustainability Leadership.

Contents

Executive Summary

Climate change and nature loss are deeply interconnected. Temperature rises, changes in precipitation patterns and extreme weather events have a range of impacts on nature. Furthermore, the decline of nature affects weather patterns and the resilience of ecosystems in the face of impacts from climate change, as well as their ability to capture and store carbon and to provide benefits to society (Kuhlow et al, 2021; Pörtner et al, 2021).

Despite their deep interconnections, climate change and nature have historically been discussed separately: the United Nations Framework Convention on Climate Change (UNFCCC) focused on global warming, and broader nature loss themes covered by Conventions on Biological Diversity (CBD) and to Combat Desertification (UNCCD).

In the financial sector, the risks and financial implications of climate change and the degradation of nature are also largely tackled as independent issues. Institutions initially focused on addressing the challenges of managing climate-related risks and the transition to a net-zero economy, given the increasing prominence of this agenda since the Taskforce for Climate-related Financial Disclosure (TCFD) published its recommendations in 2017.

Today, financial institutions are engaging and supporting clients with their emissions reduction plans. This engagement must also address nature loss. If it does not, a number of risks and opportunities will be missed, including the:

i. materiality of nature-related risks, over and above climate-related financial risks
ii. unintended consequences for nature when actions focus exclusively on climate mitigation and adaptation
iii. compounding effects from interactions between climate change and nature loss
iv. potential synergies and cost efficiencies when addressing climate change and nature and
v. macroprudential risks to the stability of the financial sector.

By detailing this rationale for integrating climate and nature, this paper aims to:

- inform the design of a corporate engagement guide for use by financial institutions which enables them, their clients and their investees to achieve net zero whilst protecting and restoring nature and
- incorporate nature-related financial risks into existing climate agendas, building on the pioneering research collaboration between CISL and its partners, including the BEI, the ILG, ClimateWise, Cambridge University academics and the Taskforce on Nature-related Financial Disclosures (TNFD).

Targets for nature protection and restoration will be finalised by the end of 2022, COP27 is due to focus more on physical adaptation and therefore nature-based resilience to extreme weather, and regulators in NGFS are broadening their environmental risks and financial stability agenda to include nature. Plainly, the time to get to grips with the interconnection between climate and nature has arrived.

Climate change and nature loss

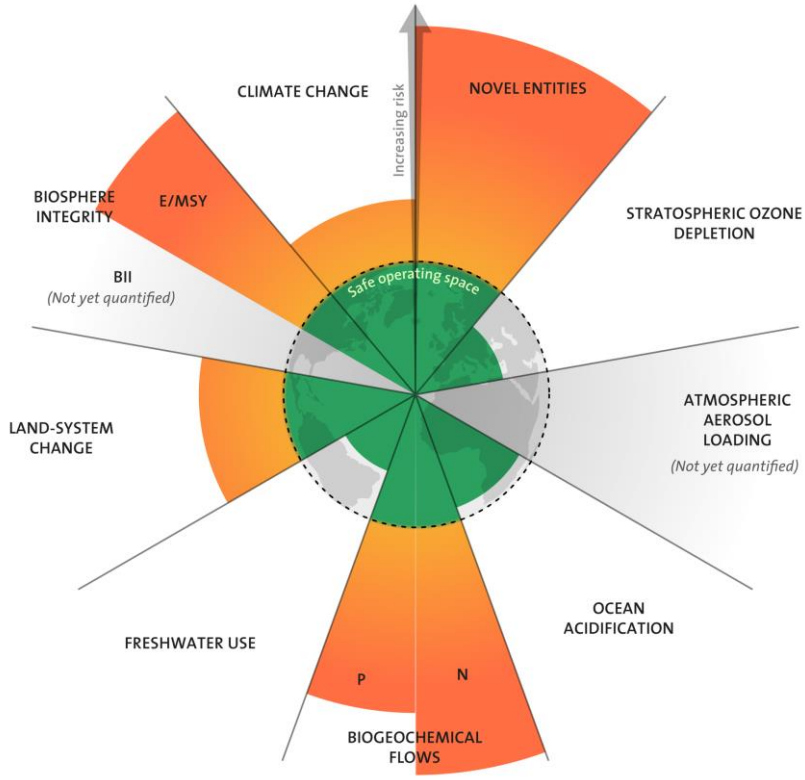
Dual challenges

The seriousness and urgency of our current environmental crisis requires a joint "climate–nature transition", namely a "transition to an economy that is not only consistent with net-zero carbon emissions but also has net-positive impacts on nature" (Finance 4 Biodiversity (F4B), 2021, p.7).

Human activity has "significantly altered" 75 percent of the land surface and about 66 percent of the marine environment (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), 2019, p. 11). The rate of the global decline in nature is unprecedented in human history, and the vast deterioration of the Earth's ecosystems – oceans, rivers and forests – is eroding the biological diversity (biodiversity) that underpins our society and economies (F4B Pledge, 2022c; IPBES, 2019).

Safe limits within which humanity can exist are being crossed across multiple Earth systems, including biosphere integrity, land-system change and climate change (Figure 1). Mean global temperatures have risen by 1.2°C since the Industrial Revolution, while the concentration of carbon dioxide in the atmosphere is at its highest level in at least two million years (Intergovernmental Panel on Climate Change (IPCC), 2021).

Figure 1 – Planetary boundaries[1] *(SRC, 2022)*



Genetic diversity: Extinction rate = Extinction/ Million Species Years (E/MSY)

Functional diversity: Biodiversity Intactness Index (BII)

[1] Credit: Azote for Stockholm Resilience Centre, based on analysis in Persson et al (2022) and Steffen et al (2015)

With multiple causes and multiple Earth systems under threat, the only logical response is a joined-up one. The stability and strengthening of our society and economies relies on addressing the nature and climate change crises in conjunction.

Given their universal reach, financial institutions are particularly well-positioned to:

a) leverage their global network of clients – which span governments, large corporates, small and medium sized enterprises (SMES) and retail customers – to **raise awareness, collaborate, engage and advocate** for the importance of addressing climate and nature as a combined challenge and
b) **mobilise capital** to enable businesses to transition to more sustainable business models, reallocating financial flows away from organisations that are damaging nature and contributing to climate change.

These two core activities fall under the concept of 'engagement' for the purposes of this paper and the ongoing CISL workstream.

In this paper, we are not able to comprehensively investigate the social dynamics associated with the transition to net-zero and nature-positive economies. CISL is seeking to do this in parallel research that we hope to integrate in the near future.

Box 1: Nature – Definition

For the purpose of this paper, **nature** is defined in line with the TNFD definition, as "the natural world, with an emphasis on the diversity of living organisms (including people) and their interactions among themselves and with their environment" (Diaz et al, 2015). It can be understood as a construct of four realms – Land, Oceans, Freshwater and Atmosphere – which underpins and interacts with society (TNFD, 2022b).

Biodiversity, in its turn, consists of "the variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (CBD, 1992).

Interconnections between climate and nature

Despite deep interconnections, climate change and nature loss have historically been discussed separately, with the United Nations Framework Convention on Climate Change (UNFCCC) focused on global warming and broader nature loss covered by Conventions on Biological Diversity (CBD) and to Combat Desertification (UNCCD).

The IPCC and IPBES recently published a joint report highlighting the interconnections between the two agendas and the importance of addressing them in an integrated manner (Dunne, 2022). This is likely to have implications for expectations of business, finance and governments. As climate-related assessments and associated disclosures become more granular and accurate, we anticipate broader-nature-related processes will do the same.

While land use change remains the main driver of nature loss, climate change is assuming an increasingly relevant role (Dunne, 2022). Higher concentrations of greenhouse gases lead to increases in temperatures, more frequent extreme weather events and changes in precipitation

patterns, with adverse consequences for biodiversity (Kuhlow et al, 2021; Pörtner et al, 2021). In the marine environment, climate change is causing intensified heatwaves, oxygen depletion and ocean acidification, which affect ecosystem functions and the livelihoods of coastal communities. As a result of ongoing climate change, many species are modifying their geographic ranges, migration patterns and how they interact with other species (IPCC, 2018; The Royal Society, 2021).

Similarly, nature loss is a key driver of climate change. Worldwide, the loss of forests and coastal ecosystems contributes to around 4.8 and 1 billion tonnes of CO_2 emissions per year, respectively, while 30 percent of global annual greenhouse gas emissions originate from food systems (Carbone, 2021; Crippa et al, 2021). Modifications in biodiversity disturb the carbon, nitrogen and water cycles, with consequences for the climate system (Pörtner et al, 2021). Vegetation is also critical for local cloud formation and, on a larger scale, may impact atmospheric circulation and influence regional, or even global, weather patterns (The Royal Society, 2021). Finally, nature intactness is also critical for the resilience of ecosystems to varying climates (Pörtner et al, 2021).

The materiality of nature loss on financial portfolios has also been established, with a recent use case finding significant risk of asset value deterioration for companies in agricultural value chains, when those farming on degrading land, as opposed to healthy soils, are exposed to an extreme weather event (CISL and Robeco, 2022). With extreme weather events becoming more common, the findings of this scenario have important implications for the rationale for integrating both nature and climate into financial decision-making processes.

These complex interactions between climate and nature can generate feedback loops, resulting in “more pronounced and less predictable outcomes” (Pörtner et al, 2021, p. 15). This could alter the accuracy of financial models based on historical data, with implications for probability of default estimations. For example, recent research quantified the transmission of the financial risk of land degradation to the agricultural value chain, concluding that smaller packaged food companies that source from areas of degrading land would experience a negative impact on valuation of as high as 45 percent (CISL and Robeco, 2022). The University of Cambridge’s Bennett Institute has shown that the loss of biodiversity can negatively impact sovereign credit ratings, making the likelihood of country-level defaults more likely in future (Agarwala et al, 2022).

The need to consider climate and nature together in financial decision-making

Context

In the financial sector, climate and nature are being tackled separately and unequally. Institutions have primarily focused on addressing the challenges of managing climate-related risks and the transition to a net-zero economy, given the increasing prominence of this agenda and since the publication of the recommendations of the TCFD in 2017. More recently, there have been growing calls for a comprehensive approach to environmental impacts and dependencies which would integrate climate change and other environmental-related issues, such as nature loss (NGFS-INSPIRE, 2022).

We recognise that nature loss and climate change encompass complex processes and issues. For nature loss, in particular, no widely agreed upon framework yet exists to assess and decide on how different aspects of nature loss should be prioritised as issues to address; nor are there advanced methods to measure the effects of nature and biodiversity loss. In view of this, the full integration of nature loss with climate change will happen over the coming years, rather than overnight.

However, **elements of integrated climate and nature risk assessment can begin already, starting with prioritisation based on available data, methods or materiality** (CISL, 2022a). The development of these frameworks and data sets will need the active participation of a wide range of stakeholders and is a necessary bedrock for financial institutions to meaningfully engage with corporate clients and investee companies.

The key effort in which to participate is the TNFD, an international cross-sector initiative, which is working to develop and deliver a risk management and disclosure framework for organisations to report and act on evolving nature-related risks and opportunities. Their principles include a climate-nature nexus angle, suggesting “an integrated approach to climate- and nature-related risks, scaling up finance for nature-based solutions” (TNFD, nd). The TNFD framework is modelled on that of the TCFD, with the ambition that organisations will achieve integrated climate–nature disclosures. The climate–nature nexus has also been the focus of research by the F4B Initiative (eg, F4B, 2021, 2022) and the Finance Sector Expert Group for Race to Zero and Race to Resilience (FSEG) (Kuhlow et al, 2021).

In parallel, changes are also happening in the regulatory sphere, encouraged by the creation of a joint NGFS-INSPIRE Study Group on Biodiversity and Financial Stability in April 2021, to assess the implications of biodiversity loss for central banks and supervisory authorities. The study group’s first recommendation to central banks and financial supervisors highlights the importance of adopting, within green finance and risk management strategies, an integrated approach that considers the links between biodiversity and climate change (NGFS-INSPIRE, 2022).

Why integrate climate and nature considerations?

A joint integration of nature and climate consideration into mainstream finance is justified by the:

i. Materiality of nature-related risks, over and above climate-related financial risks

   eg, financial risks for the pharmaceutical industry, for which new drug development is threatened by deforestation

ii. Unintended consequences for nature when actions focus exclusively on climate mitigation and adaptation

   eg, incorrect assumptions about the feasible scale of bioenergy with carbon capture and storage (BECCS) and afforestation, with implications for valuations of companies in carbon-intensive sectors

iii. Dangers of disregarding compounding effects from interactions between climate change and nature loss

   eg, increased risks of flooding due to combined impacts from climate change and land degradation

iv. Potential synergies and cost efficiencies when addressing climate change and nature

   eg, financial opportunities when designing effective nature-based solutions and synergies when building out and updating risk models, creating incentive schemes and engaging with corporates, thereby also avoiding the risk of building isolated processes, strategies and funding solutions and

v. Potential risks to the stability of the broader financial sector

   eg, common dependencies on nature creating large losses in different sectors, causing risks at the portfolio level and making it more challenging to diversify risk.

Figure 2 – The rationale for an integrated climate–nature approach

(i) Materiality of nature-related risks, over and above climate-related financial risks

Climate change is only one driver of ecosystem service[2] decline (Figure 3). If we do not move beyond climate risk, there will continue to be unmeasured and unmanaged nature-related risks in financial portfolios. (NGFS-INSPIRE, 2022, p. 3).

Taking a climate-only risk lens also means that some sectors would not be prioritised, although they are strongly impacted by nature loss. For example, drug development is threatened by deforestation, with an estimated 2,000 plants with anti-cancer properties residing in tropical rainforests (Global Canopy and Vivid Economics, 2020).

[2] Environmental assets generate "flows of benefits" to society and the economy. These so-called "ecosystem services" include (i) provisioning services, such as the provision of food, fresh water, genetic resources, medicinal resources, energy and raw materials; (ii) maintenance and regulating services, that is, the regulation of climate, the purification of water and air, pollination and biological pest and disease control; (iii) cultural services, including contributions to physical and mental health, as well as enabling recreational and spiritual experiences; and (iv) supporting services, such as nutrient cycling and soil formation, which underpin all the other ecosystem services (NGFS-INSPIRE, 2022; TNFD, 2022b).

In addition, as governments, regulators and citizens begin to demand nature-positive[3] activities, businesses that have material dependencies on nature and/or continue to negatively impact nature will see nature-related transition and liability risks materialise (Figure 3). Such unsustainable practices include those related to the use of freshwater, chemicals or land. An example of unsustainable chemical use has been explored in a CISL use case looking at the transition risk that materialises as a result of EU policies seeking to create a sustainable and resilient food system by reducing fertiliser use by at least 20 percent. This could put up to 46 percent of fertiliser company equity value at risk (CISL et al, 2022). Transition risks could also impact the forest, land and agriculture sector: a recent review attested that of nearly 150 companies already committed to net zero, just nine are "making strong progress in deforestation" (Climate Champions, 2022). Despite the relevance of these risks for forward-looking analysis, they are not considered when chosen scenarios are exclusively focused on in the assessment of climate-related financial risks (F4B, 2021).

Figure 3. Framework for identifying nature-related financial risks (CISL, 2021a)

[3] A nature-positive economy is one in which "businesses, governments and others take action at scale to minimise and remove the drivers and pressures fuelling the degradation of nature, to actively improve the state of nature itself and to boost nature's contribution to society" (CISL, 2022b).

(ii) Unintended consequences for nature when actions focus exclusively on climate mitigation and adaptation

Investment and lending decisions made with only climate risk in mind may unintentionally have damaging consequences, with climate mitigation activities potentially proving harmful to nature.

To demonstrate the potential unintended consequences caused by a pure focus on net-zero targets, we can consider BECCS (Pörtner et al, 2021). BECCS consists of growing crops, burning or converting them in power plants, industrial facilities or biorefineries and capturing the resulting CO_2, which is then injected into naturally occurring porous rock formations (Dunne, 2022; Fajardy et al, 2019). As a strategy for carbon removal, BECCS is commonly present in climate scenarios that limit global temperature rise to 1.5°C or 2.0°C above pre-industrial levels to prevent temperatures from exceeding the desired target or to make them decline towards the targeted level after an "overshoot" (F4B, 2021; PRI, 2020, p. 28). However, the scale envisaged by most models would require large amounts of land that is already providing food or other ecosystem services (The Royal Society, 2021). A joint climate–nature assessment would result in more realistic assumptions about the large-scale roll-out of technologies, such as BECCS, in turn creating pragmatic pathways for emissions reductions that will accelerate change in carbon-intensive sectors and readjust valuations within those sectors (F4B, 2021; Keyßer and Lenzen, 2021; Kuhlow et al, 2021; NGFS-INSPIRE, 2022; Vivid Economics, 2020).

Tree planting pledges are another example of how thinking only about carbon can lead to perverse solutions. Afforestation as a climate change solution/offsetting tool relies on rapid tree growth and often involves large-scale, fast-growing, monoculture plantations. However, monocultures do not offer biodiversity, nor address the nature degradation/restoration challenge; therefore, the ecosystem services, that is, the benefits to society, are strictly limited. Monoculture plantations are less resilient to disease, pests and changes in climate, affecting carbon storage in the long run. In addition, afforestation with non-native species might bring in new pests and diseases or pose additional water security risks in semi-arid regions. Financial incentives for planting trees at large scale might put additional pressure on native forests and eventually compromise local land rights (Seddon et al, 2020).

Understanding these unintended consequences is essential for properly assessing and understanding risks, uncertainties and opportunities, as well as for reputation management and effective engagement with corporates to ensure credible science-based targets and transition plans (Vivid Economics, 2020).

(iii) Dangers of disregarding compounding effects from interactions between climate change and nature loss

Physical impacts from climate change and nature loss can interact, amplifying the risks to businesses and financial portfolios. Furthermore, since feedbacks between climate change and nature loss might occur, the separate analysis of each of these topics will underestimate potential financial risks (NGFS-INSPIRE, 2022). For example, due to changes in temperature and rainfall, natural landscapes are facing increasing risks of fire or drought, which are exacerbated

when ecosystems are degraded (Dunne, 2022). A recent simulation showed that water stress scenarios could significantly impact the credit risk of heavy industry companies in East Asia, with a significant share of companies in the sample moving from investment grade to speculative grade (CISL and HSBC, 2022). Mutual reinforcement can also occur for flooding risks, due to combined impacts from climate change and land degradation: climate change makes extreme weather events more frequent, while deforestation removes the capability of forests to prevent run-offs and damage from flooding (F4B, 2022).

(iv) Potential synergies and cost efficiencies when addressing climate change and nature

A joint climate–nature transition "to an economy that is not only consistent with net-zero carbon emissions but also has net-positive impacts on nature" (F4B, 2021, p. 7) offers financial institutions opportunities to mobilise more capital towards sustainable business practices. For example, 'well-designed' Nature-based Solutions (NbS) have the potential to support both climate mitigation and adaptation challenges, while enabling nature restoration (The Royal Society, 2021; Seddon et al, 2020). NbS are "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits" (UNEP, 2022, p. 2). If properly implemented, they can contribute to:

- reducing emissions by preventing deforestation and land degradation
- implementing sustainable practices in agriculture
- restoring forests and other biomes
- improving forest management and
- enhancing soil carbon.

NbS can also be a cost-effective way of increasing resilience in the face of climate change. For instance, green infrastructure, such as mangroves and salt marshes, can be up to five times cheaper than grey infrastructure (Dasgupta, 2021). This underscores the potential synergies of addressing climate change and nature loss concurrently to abate financially material risk whilst realising financially material opportunities and, in doing so, bridging the US$150 billion per annum financing gap required to protect and restore nature (Deutz et al, 2020).

Done in a scientifically robust manner, mobilising finance to invest in nature and business resilience can generate financial opportunities as well as positive impact (Kuhlow et al, 2021). This large increase in investments in nature can, and must, support the widespread and urgent decarbonisation of our economies, particularly as the biosphere has limited capacity to hold carbon compared to current and potential fossil fuel emissions (Seddon et al, 2021; The Royal Society, 2021). Financial institutions must take an integrated approach to assess finance's impact on ecosystem health and climate stability so as not to reduce the ambition of other climate mitigation actions.

There are also resource efficiencies to be gained by taking an integrated approach. At the organisational level, an integrated climate–nature approach could generate synergies when building out and updating risk models, designing credible net zero transition plans and

associated incentive schemes and engaging with corporates. At a time when financial decision-makers are pressed by regulatory, commercial and reputational drivers to deliver net-zero targets, upskilling existing teams to incorporate nature-related risk considerations will be vital to ensure speed and efficiency in achieving targets. This joint approach would prevent additional delays in developing the necessary products, services and engagement strategies to actively support real economy actors in relation to transitioning to more sustainable business activities.

(v) Potential risks to the stability of the broader financial sector

Managing nature-related risks cannot "wait" until climate-related risks are addressed (Global Canopy and Vivid Economics, 2020, p. 3). In a recent report, the NGFS-INSPIRE (2022, p. 2) underscored that "there is sufficient evidence to suggest that the problem could be systemic (…)". The document identified that 45 central banks and supervisors are already implementing measures to address nature-related risks but recommended further action, within their mandates, to properly address the financial risks from nature loss.

Indeed, nature-related risks are spread widely across the economy, both vertically and horizontally, given that different companies from several sectors have common dependencies and impacts on nature and ecosystem services (Global Canopy and Vivid Economics, 2020). For example, a recent mapping exercise on the exposure of the MSCI All World Index to ecosystem services revealed the dependency of companies across a range of sectors on water security (CISL and Aon, 2022). Another recent analysis by Banque de France showed that 42 percent of the total value of securities held by French financial institutions were issued by companies that are highly or very highly dependent on at least one ecosystem service (NGFS-INSPIRE, 2022). Changes in natural processes can also happen in non-linear ways, with the possibility of crossing irreversible tipping points (NGFS-INSPIRE, 2022) and, in turn, endangering wider financial stability.

Conclusion and next steps

Figure 4 – Adjusted business and operating model, Bank 2030 (CISL, 2020a)

Previous CISL research identified that, within leading financial institutions, the journey to net zero starts with a C-suite strategic approach and an 'active mindset', underpinned by a clear recognition that the transition to a sustainable economy is inevitable. Having set a strategic vision, financial institutions begin to adjust their business and operating model, empowering employees and evolving the risk function. To adequately address the multiple planetary health crises we face, the evolution of the risk management function needs to consider climate and nature jointly, as do the product offering and customer service model (Figure 4). By doing so, the basis on which financial firms engage with clients and investee companies will evolve beyond the current net-zero transition agenda.

The financial sector cannot solve the challenge of integrating the nature and climate agendas alone. Policymakers, regulators, clients and investee companies need to make considerable changes to incorporate nature into policy, business activities and disclosure that involve climate so that capital can be mobilised to support the protection and restoration of nature. Financial institutions can advocate for clearer policies and regulatory guidelines, similar to the UK's Prudential Regulatory Authority's Supervisory Statement on Climate Financial Risks in 2019, which drove an accelerated change in practice to climate risk management within firms.

With this rationale for integrating climate and nature considerations into financial decision-making, CISL will work with financial institutions, academics and other collaborative initiatives to enable the finance sector to engage with clients and investee companies on both nature and climate. This focus on corporate engagement would aim to:

1. host roundtables to identify the leadership in corporate engagement in the domains of the net-zero transition and nature loss avoidance, as well as raise the ambition level by sketching what will be required to successfully deliver on TCFD, TNFD and commitments to restore nature and mitigate climate change concurrently
2. build capacity amongst members of the BEI and ILG, embedding the rationale for a joint climate–nature approach and the concepts of planetary system health needed to begin constructive corporate engagement and
3. collaboratively develop a guide on corporate engagement with financial institutions that accounts for synergies and trade-offs between climate change and nature, mobilising capital in support of the UN Sustainable Development Goals more broadly.[4]

Targets for nature protection and restoration will be finalised by the end of 2022, COP27 is due to focus more on physical adaptation and regulators in NGFS are broadening their environmental risks agenda to include nature. Plainly, the time to get to grips with the interconnection between nature and climate has arrived.

[4] This consultation and collaboration will follow a similar structure to the Let's Discuss Climate: Essential guide to bank-client engagement (CISL, 2021b), presenting impactful questions that should be asked at each stage of corporate engagement and key tools for supporting this process.

Appendix 1: The current landscape

In the financial and corporate world, nature-related considerations have risen up the agenda, in line with early-stage research by CISL and others (CISL, 2020c, 2021a; Global Canopy and Vivid Economics, 2020) and with initiatives such as Natural Capital Finance Alliance, Natural Capital Coalition, EU Finance@Biodiversity and Business for Nature. The increasing visibility of this topic is made evident by a recent proliferation of tools and methodologies (Table 1).

Table 1 - Examples of tools, methodologies and standards

Aim	References
Provide commodity supply-chain data	eg Trase, SPOTT, Forest 500
Measure biodiversity footprints of financial portfolios	Guidance on existing tools available in Hilton and Lee (2021) and Finance for Biodiversity Pledge (2022a), including Biodiversity Footprint Financial Institutions (BFFI), Biodiversity Impact Analytics powered by the Global Biodiversity Score (BIA-GBS), Corporate Biodiversity Footprint (CBF), Global Biodiversity Score for Financial Institutions (GBSFI) and Global Impact Database (GID)
Set accounting standards	PBAF, 2022
Enable location-specific assessments	eg Global Forest Watch, ENCORE hotspot database, Integrated Biodiversity Assessment Tool (IBAT)
Compare corporate performance towards nature	World Benchmarking Alliance, 2022
Offer guidance for target-setting	SBTN, 2020; UNEP FI and UNEP-WCMC, 2021

Efforts are also underway to improve current nature-related data and analytics, as well as the disclosure of nature-related risks and impacts, as exemplified by the Nature-related Data Catalyst convened by the TNFD (TNFD, 2022b), the ongoing development of the TNFD Framework (TNFD, 2022a), the International Financial Reporting Foundations (IFRS) consultation process on sustainability reporting (IFRS, 2022), the review of the GRI Standards for Biodiversity (GRI 304) and the update of CDP questionnaires to better cover biodiversity issues. Moreover, guidance is already available for corporate engagement on key issues, such as plastic packaging, water and biodiversity (eg PRI, 2018; PRI, 2021; VBDO, nd; F4BPledge, 2022b).

However, compared to climate change, the integration of nature-related considerations is less mature in financial decision-making (Kuhlow et al, 2021, NGFS-INSPIRE, 2022). Given the complexity and dynamism of this agenda, it is challenging for practitioners to absorb and operationalise these developments. In addition, despite the increasing recognition that climate and nature should be jointly addressed, there is still limited guidance on how financial actors could adopt an integrated approach, including through corporate engagement.

References

Agarwala, M., Burke, M., Klusak, P., Kraemer, M., Volz, U. (2022). Nature loss and sovereign credit ratings. Retrieved from: https://www.cam.ac.uk/stories/biodiversitycreditratings

Carbone, G. (2021). Natural climate solutions: working with nature to tackle the climate crisis. 9 November. Retrieved from: https://climatechampions.unfccc.int/natural-climate-solutions-working-with-nature-to-tackle-the-climate-crisis/

CBD (1992). Convention on Biological Diversity. Retrieved from: https:// www.cbd.int/doc/legal/cbd-en.pdf

Crippa, M., Solazzo, E., Guizzardi, D. et al (2021). Food systems are responsible for a third of global anthropogenic GHG emissions. Nat Food 2, 198–209. Retrieved from: https://doi.org/10.1038/s43016-021-00225-9

Dasgupta, P. (2021). *The Economics of Biodiversity: The Dasgupta Review*. London: HM Treasury. Retrieved from: https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review

Deutz, A., Heal, G. M., Niu, R., Swanson, E., Townshend, T., Zhu, L. et al (2020). Financing Nature: Closing the global biodiversity financing gap. The Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability. Retrieved from: https://www.paulsoninstitute.org/wp-content/uploads/2020/09/FINANCING-NATURE_Full-Report_Final-Version_091520.pdf

Díaz, S., Demissew, S., Carabias, J., Joly, C., Lonsdale, M., Ash, N., et al (2015). The IPBES Conceptual Framework — connecting nature and people. Current Opinion in Environmental Sustainability, Volume 14, 2015, Pages 1-16, ISSN 1877-3435, https://doi.org/10.1016/j.cosust.2014.11.002

Dunne, D. (2022) Can climate change and biodiversity loss be tackled together? Retrieved from: https://www.carbonbrief.org/explainer-can-climate-change-and-biodiversity-loss-be-tackled-together/

Fajardy, M., Koberle, A., Mac Dowell, N., and Fantuzzi, A. (2019). BECCS deployment: a reality check. Grantham Institute, Briefing paper No. 28, January. Retrieved from: https:// www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/BECCS-deployment---a-reality-check.pdf

Finance for Biodiversity Initiative (F4B). (2021). The Climate-Nature Nexus: Implications for the Financial Sector. Retrieved from: https://www.f4b-initiative.net/post/the-climate-nature-nexus-implications-for-the-financial-sector

Finance for Biodiversity Initiative (F4B). (2022). Towards an Integrated Transition Framework: Managing Risks and Opportunities at the Nature-Climate Nexus. Retrieved from: https://www.f4b-initiative.net/publications-1/towards-an-integrated-transition-framework---managing-risks-and-opportunities-at-the-nature-climate-nexus

Finance for Biodiversity Pledge. (2022a) Finance for Biodiversity: Guide on biodiversity measurement approaches. Retrieved from: https:// www.financeforbiodiversity.org/wp-content/uploads/Finance-for-Biodiversity_Guide-on-biodiversity-measurement-approaches_2nd-edition.pdf

Finance for Biodiversity Pledge. (2022b) Finance for Biodiversity: Guide on engagement with companies. Retrieved from: https://www.financeforbiodiversity.org/wp-content/uploads/Finance-for-Biodiversity_Guide-on-engagement-with-companies.pdf

Finance for Biodiversity Pledge. (2022c). Finance for Biodiversity: Reverse nature loss in this decade - Guidance to the Pledge. Retrieved from: https://www.financeforbiodiversity.org

Global Canopy and Vivid Economics. (2020). The Case for a Task Force on Nature-related Financial Disclosures. Retrieved from: https://www.vivideconomics.com/casestudy/the-case-for-a-task-force-on-nature-related-financial-disclosures/#:~:text=Project-,The%20Case%20for%20a%20Task%20Force%20on%20Nature%2Drelated%20Financial,related%20Financial%20Disclosures%20can%20help.

Hilton, S. and Lee, JM J. (2021). Assessing Portfolio. Impacts - Tools to Measure Biodiversity and SDG. Footprints of Financial Portfolios. Retrieved from: https://wwfint.awsassets.panda.org/downloads/wwf_assessing_portfolio_impacts_final.pdf

IFRS (2022). ISSB delivers proposals that create comprehensive global baseline of sustainability disclosures. 31 March 2022. Retrieved from: https://www.ifrs.org/news-and-events/news/2022/03/issb-delivers-proposals-that-create-comprehensive-global-baseline-of-sustainability-disclosures/

IPBES. (2019). The global assessment report on biodiversity and ecosystem services - Summary for policymakers. Retrieved from: https://www.ipbes.net

IPCC. (2018). Special Report: Global Warming of 1.5°C. [Internet]. Retrieved from: https://www.ipcc.ch/sr15/

IPCC. (2021). Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, In press, doi:10.1017/9781009157896. Retrieved from: https://www.ipcc.ch/report/ar6/wg1/

Keyßer, L.T., Lenzen, M. 1.5 °C degrowth scenarios suggest the need for new mitigation pathways. (2021) Nat Commun 12, 2676. Retrieved from: https://doi.org/10.1038/s41467-021-22884-9

Kuhlow, M., Dixon, C., Lima, A., Mckenzie, E., Reid, S., Smale, R., Yao, W. (2021, p11). How can finance help address our dual climate and nature crisis? FSEG. Retrieved from: https://climatechampions.unfccc.int/wp-content/uploads/2022/03/CC-report_Draft-4.pdf

NGFS-INSPIRE. (2022). *Central banking and supervision in the biosphere.* Retrieved from: https://inspiregreenfinance.org/publications/central-banking-and-supervision-in-the-biosphere/

PBAF (2022). Taking biodiversity into account: PBAF Standard v 2022 Biodiversity impact assessment - Overview of approaches. Retrieved from: https://pbafglobal.com/files/downloads/PBAF_commongroundpaper2020.pdf

Persson, L., Almroth, B., Collins, C., Cornell, S., W, C., Diamond, M., Fantke, P. et al (2022). Outside the Safe Operating Space of the Planetary Boundary for Novel Entities. Environmental Science & Technology 56 (3), 1510-1521 DOI: 10.1021/acs.est.1c04158

Pörtner, H.O., Scholes, R.J., Agard, J., Archer, E., Arneth, A., Bai, X., Barnes, et al 2021. Scientific outcome of the IPBES-IPCC co-sponsored workshop on biodiversity and climate change; IPBES secretariat, Bonn, Germany, DOI:10.5281/zenodo.4659158. Retrieved from: https://ipbes.net/events/ipbes-ipcc-co-sponsored-workshop-report-biodiversity-and-climate-change

PRI (2018). Growing water risk resilience: An investor guide on agricultural supply chains. Retrieved from: https://www.unpri.org/plastics/engaging-on-plastic-packaging/8137.article.

PRI. (2020). Pathways to net zero: Scenario architecture for strategic resilience testing and planning. Retrieved from: https://www.unpri.org/download?ac=10762

PRI (2021). Engaging on plastic packaging. Retrieved from: https://www.unpri.org/plastics/engaging-on-plastic-packaging/8137.article.

SBTN (2020). Science-based targets for nature: Initial guidance for business. Retrieved from: https://sciencebasedtargetsnetwork.org/wp-content/uploads/2020/11/Science-Based-Targets-for-Nature-Initial-Guidance-for-Business.pdf

Seddon, N., Chausson, A., Berry, P., Girardin, C. A. J., Smith, A., and Turner, B. (2020). Understanding the value and limits of nature-based solutions to climate change and other global challenges. In Philosophical Transactions of the Royal Society B: Biological Sciences (Vol. 375, Issue 1794). Royal Society Publishing. https://doi.org/10.1098/rstb.2019.0120

Seddon, N., Smith, A., Smith, P., Key, I., Chausson, A., Girardin, C., House, J., Srivastava, S., and Turner, B. (2021). Getting the message right on nature-based solutions to climate change. Global Change Biology, 27(8), 1518–1546. https://doi.org/10.1111/gcb.15513

SRC. (2022). Planetary boundaries. Retrieved from: https://stockholmresilience.org/research/planetary-boundaries.html

Steffen, W., Richardson, K., Rockstrom, J., et al (2015). Planetary boundaries: Guiding human development in a changing planet. Retrieved from: https://www.science.org/doi/10.1126/science.1259855

The Royal Society. (2021, 10). Climate change and biodiversity: Interlinkages and policy options. Retrieved from: https://royalsociety.org/-/media/policy/projects/bio-climate-interlinkages/interlinkages-between-climate-change-and-biodiversity.pdf

TNFD (nd) The TNFD Principles. Retrieved from: https://tnfd.global/the-tnfd-principles/

TNFD. (2022a). The Nature-related data catalyst. Retrieved from: https://tnfd.global/data-catalyst/

TNFD. (2022b). The TNFD Nature-Related Risk & Opportunity Management and Disclosure Framework Beta v0.1 - Executive Summary. Retrieved from: https://tnfd.global/the-tnfd-framework/tnfd-framework-summary/

UNEP (2022). United Nations Environment Assembly of the United Nations Environment Programme – Fifth Session. Nairobi, 22 and 23 February 2021 and 28 February – 2 March 2022. Retrieved from: https://wedocs.unep.org/bitstream/handle/20.500.11822/39864/NATURE-BASED%20SOLUTIONS%20FOR%20SUPPORTING%20SUSTAINABLE%20DEVELOPMENT.%20English.pdf?sequence=1&isAllowed=y

UNEP FI and UNEP-WCMC (2021). Biodiversity Target-setting: Guidance for banks (Version 1: June 2021), Principles for Responsible Banking. UNEP Finance Initiative: Geneva.

University of Cambridge Institute for Sustainability Leadership. (nd). Research at CISL. Retrieved from: https://www.cisl.cam.ac.uk/research/research-at-cisl

University of Cambridge Institute for Sustainability Leadership. (2020a). Bank 2030: Accelerating the transition to a low carbon economy. Cambridge: University of Cambridge Institute for Sustainability Leadership. Retrieved from: https://www.cisl.cam.ac.uk/resources/sustainable-finance-publications/bank-2030-accelerating-the-transition-to-a-low-carbon-economy

University of Cambridge Institute for Sustainability Leadership (CISL). (2020b). Biodiversity Loss and Land Degradation: An Overview of the Financial Materiality. Retrieved from: https://www.cisl.cam.ac.uk/system/files/documents/biodiversity-loss-and-land-degradation-overview.pdf

University of Cambridge Institute for Sustainability Leadership (CISL). (2020c). Measuring business impacts on nature: A framework to support better stewardship of biodiversity in global supply chains. Cambridge, UK: University of Cambridge Institute for Sustainability Leadership Retrieved from: https://www.cisl.cam.ac.uk/resources/natural-resource-security-publications/measuring-business-impacts-on-nature

University of Cambridge Institute for Sustainability Leadership (CISL). (2021a). *Handbook for nature-related financial risks: key concepts and a framework for identification*. Retrieved from: https://www.cisl.cam.ac.uk/system/files/documents/handbook-for-nature-related-financial.pdf

University of Cambridge Institute for Sustainability Leadership (CISL). (2021b). Let's Discuss Climate: The essential guide to bank-client engagement. Cambridge, UK: University of Cambridge Institute for Sustainability Leadership. Retrieved from: https:// www.cisl.cam.ac.uk/resources/sustainable-finance-publications/lets-discuss-climate-the-essential-guide-to-bank-client-engagement

University of Cambridge Institute for Sustainability Leadership (CISL). (2022a). Integrating Nature: The case for action on nature-related financial risks. Cambridge: University of Cambridge Institute for Sustainability Leadership. Retrieved from: https://www.cisl.cam.ac.uk/resources/publications/integrating-nature-case-action-nature-related-financial-risks

University of Cambridge Institute for Sustainability Leadership (CISL). (2022b). Nature-Positive Hub. Retrieved from: https://www.cisl.cam.ac.uk/resources/nature-positive.

University of Cambridge Institute for Sustainability Leadership (CISL) and AON. (2022). Nature-related financial risk: use case. Mapping exposure to nature-related risks across financial indices. Cambridge,

UK: University of Cambridge Institute for Sustainability Leadership. Retrieved from: https://www.cisl.cam.ac.uk/files/cisl_aon_mapping_exposure_to_nature-related_risks_across_financial_indices_apr22.pdf

University of Cambridge Institute for Sustainability Leadership (CISL) and HSBC. (2022). Nature-related financial risk: use case. Impact of water curtailment on credit rating of heavy industry companies in East Asia. Retrieved from: https://www.cisl.cam.ac.uk/resources/publications/impact-water-curtailment-credit-rating-heavy-industry-nature-related

University of Cambridge Institute for Sustainability Leadership (CISL), Deutsche Bank and Union Bancaire Privée (UBP). (2022). Nature-related financial risk: use case. The EU Farm to Fork Strategy and Fertiliser Companies. Retrieved from: https://www.cisl.cam.ac.uk/resources/publications/eu-farm-fork-strategy-and-fertiliser-companies-nature-related-financial-risk

University of Cambridge Institute for Sustainability Leadership (CISL) and Robeco. (2022). How soil degradation amplifies the financial vulnerability of listed companies in the agricultural value chain. Retrieved from: https://www.cisl.cam.ac.uk/resources/publications/how-soil-degradation-amplified-financial-vulnerability-nature-related

VBDO. (nd). Engagement guide on biodiversity and mining. Retrieved from: https://www.vbdo.nl/wp-content/uploads/2020/09/VBDO004-Engagement-Guide-on-Biodiversity-3-1.pdf

Vermeulen, A., Poolen, N., Bake-Dijkstra, A.-C., Knijp, G., Arke, F., Herrmann, S., . . . Söffker, H. (2022, 4). WWF and Deloitte. Nature is next: Integrating nature-related risks into the Dutch Financial sector. Retrieved from: https://www2.deloitte.com/nl/nl/pages/sustainability/articles/nature-is-next-towards-integrating-nature-related-risks-in-the-dutch-financial-sector.html

Vivid Economics. (2020). An investor guide to negative emissions technologies and the importance of land use. October 2020. Retrieved from: https://www.unpri.org/download?ac=11980.

World Benchmarking Alliance (WBA). (2022). Nature Benchmark Methodology. Retrieved from: https://www.worldbenchmarkingalliance.org/research/2022-nature-benchmark-methodology/

WEF (2020). Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy. Retrieved from: https://www3.weforum.org/docs/WEF_New_Nature_Economy_Report_2020.pdf