Unlocking the biodiversity-climate nexus

A practitioner's guide for financial institutions

Finance *for* Biodiversity Foundation

October 2023

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Finance *for* Biodiversity Foundation

Executive summary

This guide presents recommendations on how to deal with the biodiversity and climate nexus. It is written by financial institutions for financial institutions, including banks, insurers, asset managers and asset owners. The authors are members of the Finance for Biodiversity (FfB) Foundation and worked on this project as part of the Foundation's Impact Assessment working group.

The nexus is reflected in the interrelationship between biodiversity and climate change, the synergies and trade-offs between these, and can be broken down into four overarching pillars:

Defining the nexus with four pillars

Pillar 1: Climate change is one of the direct drivers of nature loss

Pillar 2: Biodiversity conservation is necessary for climate action

Pillar 3: Biodiversity solutions can impact climate negatively

Pillar 4: Climate action can affect nature negatively

Based on these pillars, this guide identifies the synergies and trade-offs that some of the key solutions create for climate change and biodiversity and presents specific recommendations for how to tackle these.

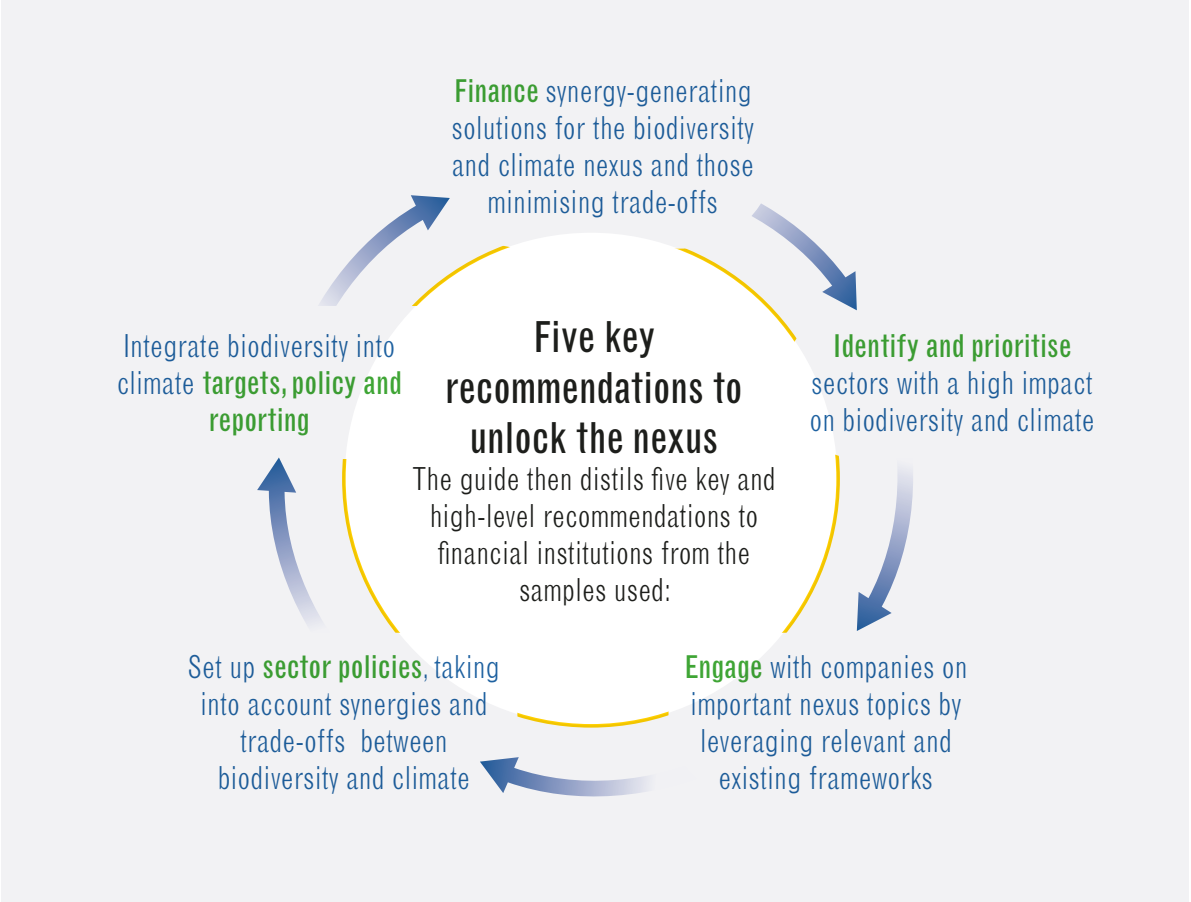


Figure 1. Key recommendations to financial institutions on how to manage the biodiversity and climate nexus.

Finance synergy-generating solutions for the biodiversity and climate nexus and those minimising trade-offs

We suggest to financial institutions to, for example:

- finance R&D, start-ups, innovations and solutions, including a combination of technological and nature solutions, to leverage synergies of the biodiversity and climate nexus.
- finance solutions that are able to tackle trade-offs in a sustainable way (e.g. sustainable land use, circular design and resource management, non-invasive renewable energy).
- explore investing in areas of innovations, using specific financing tools such as blended finance (a mixture of public and private funds), private equity, project financing, etc.

Identify and prioritise sectors with a high impact on biodiversity and climate

We suggest to financial institutions to, for example:

- focus their efforts on the most material issues by identifying high-risk and high-impact sectors for climate and biodiversity.
- use research by the FfB Foundation (e.g. the Top 10 biodiversity-impact ranking), Nature Action 100 (NA100) and Climate Action 100+ (CA100+), as well as analytical tools, raw data and rankings (e.g. CDP Climate Change and CDP Forests tools, Coller FAIRR Protein Producer Index, Forest 500 scores and rankings) to prioritise sectors and companies for their investments, lendings and engagements.
- decide which sectors to prioritise while considering possible transition pathways and future scenarios in line with the Global Biodiversity Framework (GBF) and the Paris Agreement, depending on their strategy, asset classes and generated positive impact.

Engage with companies on important nexus topics by leveraging relevant and existing frameworks

We suggest to financial institutions to, for example:

- engage on corporate environmental, social and governance (ESG) strategies to address the nexus, specifically on setting science-based targets on climate, according to the Science Based Targets initiative (SBTi) and, where available, on nature, according to the Science Based Targets Network (SBTN). Banks can apply the 10 Equator Principles as a framework for their engagements.
- join collaborative engagement initiatives, such as CA100+ and Nature Action 100 (NA100) and the FfB Foundation's Engagement with Companies working group.
- apply guidelines for their engagements, such as the Guide on engagement with companies by the FfB Foundation and Finance@Biodiversity Community.

Set up sector policies, taking into account synergies and trade-offs between biodiversity and climate

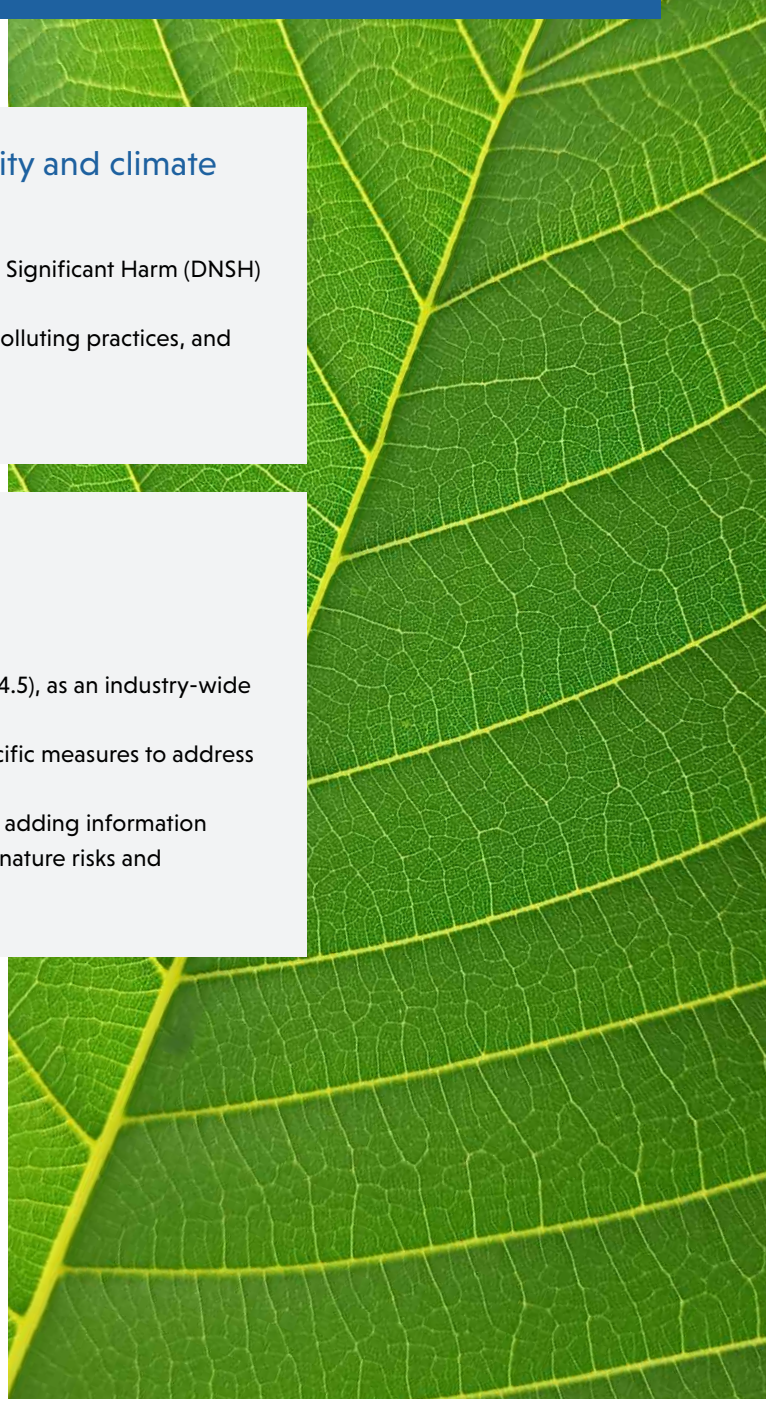
We suggest to financial institutions to, for example:

- set up a nexus strategy which applies, for example, sector-specific rules, obligatory engagement, exclusion lists or a Do No Significant Harm (DNSH) approach.
- develop relevant activity-based policies aiming to reduce nature-related risks such as deforestation, illegal wildlife trade, polluting practices, and deforestation-linked commodities including palm oil and soy, use of single-use plastics and hazardous chemicals.
- integrate certified sustainability standards, credible eco-labels and third-party verification systems in their nexus policy.

Integrate biodiversity into climate targets, policy and reporting

We suggest to financial institutions to, for example:

- use the Global Biodiversity Framework as a starting point to explore setting targets based on it.
- join the FfB Foundation where efforts to develop a target-setting framework are currently taking place (see box in chapter 4.5), as an industry-wide KPI directory for biodiversity and climate is not existing as of today.
- extend their climate policy to the nexus by committing to the Do No Significant Harm (DNSH) principle and by adding specific measures to address synergies and trade-offs of nexus issues (see recommendations of chapter 4.5).
- integrate biodiversity-related disclosures into their Task Force on Climate-related Financial Disclosures (TCFD) reporting, by adding information as required from the Taskforce on Nature-related Financial Disclosures (TNFD) guidelines to ensure that neither climate nor nature risks and opportunities are overlooked.



1. Introduction

The historic Kunming-Montreal Global Biodiversity Framework (GBF), agreed by nearly 200 countries at the Fifteenth meeting of the Conference of the Parties (COP15) in December 2022, marked an important turning point for nature. It helped increase investor attention to biodiversity issues as a whole. Explicitly, the GBF outlines actions financial institutions need to take to reverse nature loss by 2030.

This is a sign that actors have recognised globally that today's rapid destruction of biodiversity must be stopped, due to the fact that it threatens economies, our climate, nature and people's livelihoods.

The collapse of select ecosystem services provided by nature – such as wild pollination, provision of food from marine fisheries and timber from native forests – was estimated to result in a decline in global GDP of $2.7 trillion annually by 2030 (World Bank, 2021).

Financial institutions are prompted to double their efforts beyond their existing climate action to also put resources behind stemming biodiversity issues. Consequently, they have begun to work on how to combine nature with their existing climate actions. By integrating biodiversity into climate change activities, financial institutions aim to address both themes in an efficient way, helping them to minimise resources while increasing positive impacts.

But the integration of biodiversity into climate change requires an in-depth understanding of how the two topics are linked and interplay with each other in regard to synergies and trade-offs, the so-called nexus.

What is not yet well understood in current research is how financial institutions can address the nexus. Among already existing research is a 2021 report titled The Climate-Nature Nexus – Implications for the financial sector by Finance for Biodiversity Initiative. The nexus is also an emerging theme for financial institutions as an approach to biodiversity investments is still under development: regulators have only started to address nature investments; company data on biodiversity impacts are not widely available; and measurement and investment metrics are not standardised (see also the Finance for Biodiversity Foundation guide Act now! The why and how of biodiversity integration by financial institutions.)

This guide is aiming at helping financial institutions to unlock the nexus by providing knowledge on key solutions and their synergies and trade-offs between biodiversity and climate. It provides financial institutions with both specific and also high-level recommendations on how to deal with the nexus.

The second chapter defines the nexus by explaining how biodiversity and climate change can impact each other positively and negatively. It establishes a basic understanding on the interplay between these. Positive climate change action, for example, does not necessarily mean a positive impact on biodiversity.

The third chapter outlines the synergies and trade-offs between climate and nature of a sample of investment/lending solutions that are, as of today, key to solving the nature and climate crises we face. These are agricultural solutions, alternative energy sources, circular economy and Nature-based Solutions (NbS). The chapter also provides specific recommendations on how to solve these.

Based on these specific recommendations from chapter 3, chapter 4 then distils five high-level recommendations for financial institutions to address the nexus.

2. Defining the nexus

The nexus is defined through the interaction of biodiversity and climate change. Biodiversity and climate change can impact each other positively and negatively and create synergies and trade-offs in the process. We see this interrelationship as being reflected through four overarching pillars:

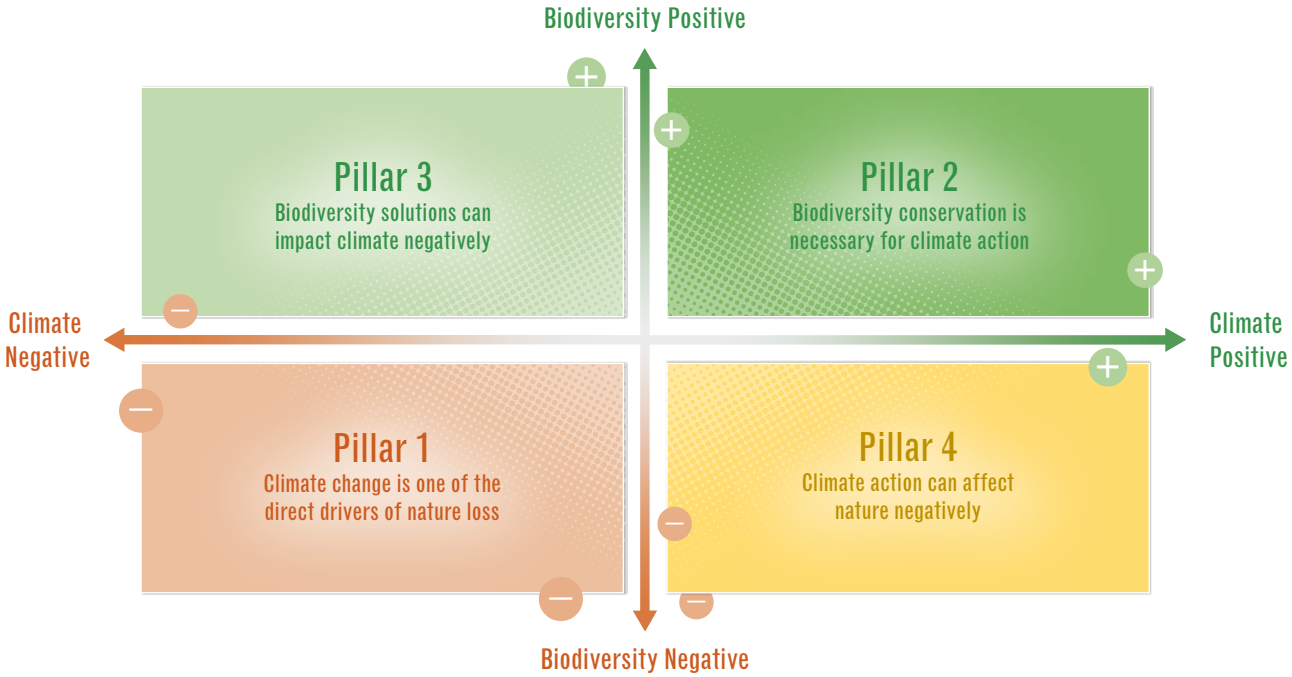


Figure 2: The four pillars defining the nexus.

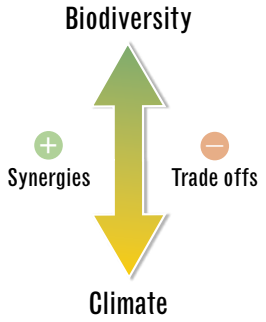


Figure 3: Synergies and trade-offs between climate and biodiversity.

2.1 Pillar 1: Climate change is one of the direct drivers of nature loss

A major driver of biodiversity loss is climate change, as the rise in temperature alters marine, land and freshwater ecosystems. According to a 2022 summary by the IPCC, climate change "has caused substantial damages, and increasingly irreversible losses, in terrestrial, freshwater and coastal and open ocean marine ecosystems".

Climate change effects such as temperature rise, precipitation and natural disasters have all been linked to increasing biodiversity loss. Animal and plant species have started to adapt where possible, shifting their geographic ranges and other attributes. But there are limits to adaptation, particularly in the face of extreme weather events, which are poised to become more likely and more severe as a result of climate change.

The 2019-2020 Australian wildfires killed or displaced an estimated 3 billion animals (WWF, 2020). These wildfires were so extreme because of the severe combination of a previous three-year drought, high temperature and low rainfall – all climate change effects. Furthermore, the first known mammal extinction attributed to human-made climate change has already happened with the disappearance of the Bramble Cay melomys, an endemic rat species from Australia's Great Barrier Reef (Wildlife Research, 2017).

Should climate change continue to progress, it will likely lead to further extinctions, with critically endangered species expected to represent up to 29% of all species at 3°C of warming, double the rate estimated at 1.5°C (IPCC, 2022).

Given that the world is currently on a 2.7°C warming trajectory (see Climate Action Tracker), such projections are worrying and need to be considered by financial institutions, as our economies are heavily reliant on the ecosystem services that biodiversity provides (read more in the FfB Foundation's guide Act now! The why and how of biodiversity integration by financial institutions).

A commonly cited example of future climate-change-induced quasi-disappearance is tropical coral reefs, which are projected to diminish by 70-90% at 1.5°C and 99% at 2°C of warming, notably due to mass coral bleaching from extreme ocean heat events (IPCC, 2018).

In fact, it was predicted that climate change could become the main driver of biodiversity loss by 2070, ahead of land use, which is the top driver today (Proceedings of the Royal Society B, 2018). Other drivers of biodiversity loss are land/sea use change, resource exploitation, pollution, invasive species and others.

2.2 Pillar 2: Biodiversity conservation is necessary for climate action

Biodiversity conservation is required for two types of climate actions, climate change mitigation and climate change adaptation (e.g. Nature-based Solutions). Most biodiversity activities related to conservation, restoration, sustainable forest management, climate-smart agriculture and livestock management usually have positive effects on climate change mitigation. This is due to nature being able to regulate the carbon cycle by serving the carbon sequestration process, which is the natural ability of trees, forests, marshes, and wetlands to store carbon.

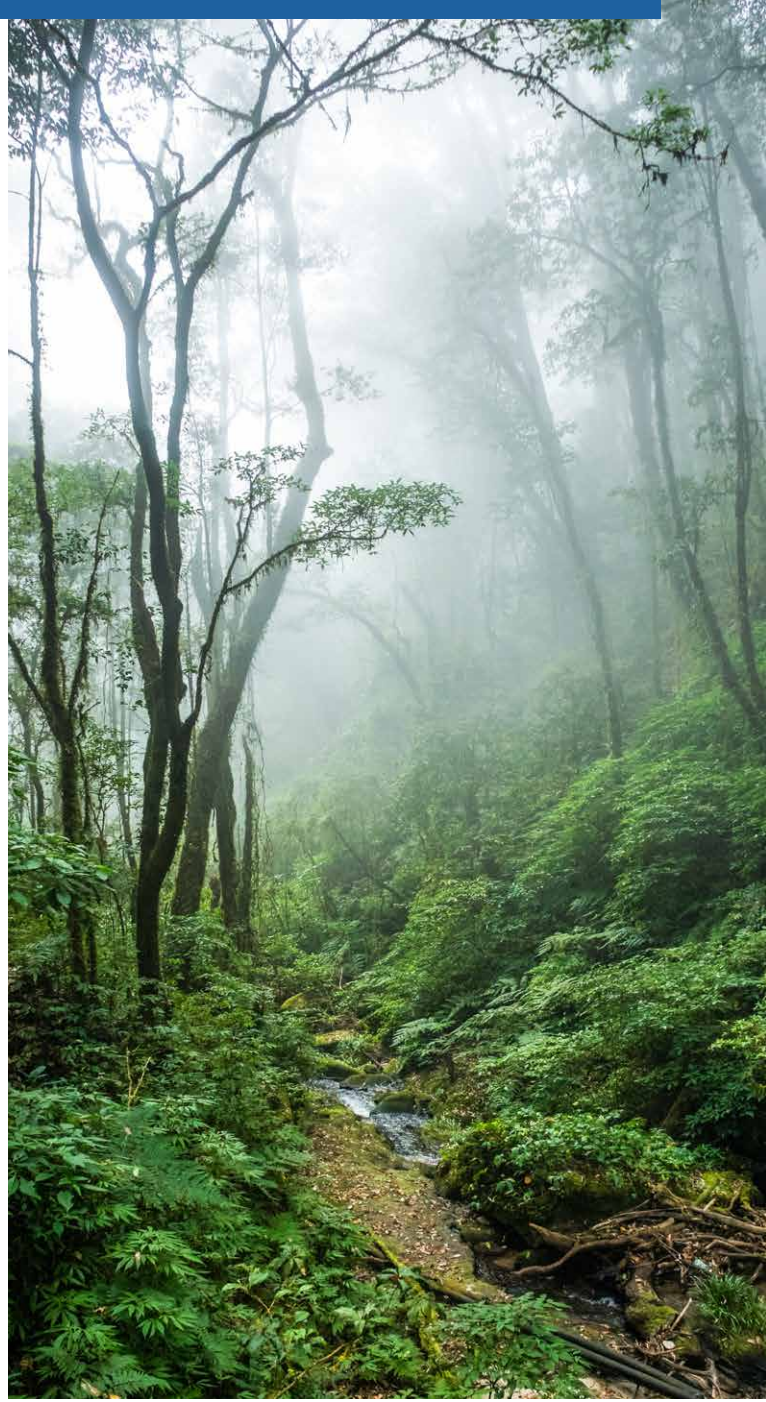
However, land use change and ecosystem degradation can impact natural carbon stocks and sequestration, and release CO_2 from the carbon cycle.

The ongoing degradation of key land systems could turn these from carbon sinks into carbon sources. It was estimated that parts of the Amazon rainforest have already become carbon sources (Nature, 2021). Studies have shown that approximately 60% of stored carbon in the Amazon tropical forests is released when a forest burns – a drastic increase of carbon in the atmosphere (UNEP and GRID-Arendal's, 2022).

'Agricultural, forestry and other land use' accounted on average for about 13-21% of global GHG emissions that occurred between 2010 and 2019 (IPCC, 2022).

Therefore, reducing natural land use change is a necessary step to decrease emissions and support climate action. Biodiversity also plays a key role in other ecosystem services essential to climate change mitigation, such as pollination and tree dissemination by large mammals (Science Advances, 2015).

Learning about conservation practices from indigenous communities and engaging with them across companies' supply chains could enhance climate mitigation. Indigenous people reside on approximately 20% of land globally but have been able to retain 80% of biodiversity they rely on. Their practices were also recognised by the Global Biodiversity Framework (GBF), which "acknowledges the important roles and contributions of indigenous peoples [...] in the conservation, restoration and sustainable use" of land.



2.3 Pillar 3: Biodiversity solutions can impact climate negatively

To truly avert biodiversity loss, we need solutions which can restore nature. Stopping climate change alone cannot restore nature, as biodiversity loss has numerous drivers, which go beyond those impacted by climate change; namely habitat loss, resource overexploitation, pollution, or invasive species.

However, these solutions need to be low carbon, as they otherwise could also worsen climate change, and thus biodiversity. For example, desalination is considered to be one of the most common solutions to address water scarcity, but most desalination plants still use fossil fuels for power generation. Unless powered by renewable energy, desalination can lead to a significant increase in greenhouse gas emissions. Therefore, positive impact can only be achieved with sustainable solutions, which simultaneously address both climate change and biodiversity loss.

2.4 Pillar 4: Climate action can affect nature negatively

Climate action does not always have a positive impact on nature. The IPCC 2022 summary for policymakers recognises that "risks arise from some responses that are intended to reduce the risks of climate change, including risks from maladaptation and adverse side effects of some emissions reduction and carbon dioxide removal measures". Whilst most climate action will usually have a positive impact on biodiversity loss, some actions – particularly those related to creating new carbon sinks through afforestation and Bioenergy with Carbon Capture and Storage (BECCS) – have an overwhelmingly negative impact on biodiversity (coined as "climate maladaptation").

Afforestation, which involves planting trees in ecosystems that have not historically been forests, and reforestation with monocultures, can negatively impact biodiversity due to competition for land, leading to land-use change elsewhere (known as "displacement effects"). Afforestation can even reduce carbon sinks, furthering biodiversity loss and, if done through single-species plantations, bring pests and diseases. Plantation of exotic species could also negatively impact biodiversity, by reducing its ability to adapt to adverse climate impacts or by becoming invasive (IPBES and IPCC, 2021). BECCS can also be detrimental if they turn large areas of land into monoculture plantations due to similar reasons such as competition for space.

This is a particular point of attention for financial institutions, given that afforestation and BECCS are the two methods typically relied on (IPCC, 2018) to increase carbon sinks, following an overshoot of carbon beyond 1.5°C warming.

It would have a very negative impact on biodiversity if it was overly relied on and used to avoid an overshoot of emissions. Renewable energy solutions can also sometimes – but not always – have trade-offs with biodiversity loss. For example, solar and wind farms could risk impacting biodiversity negatively if they require large land areas; directly, by destroying natural areas and wildlife fatalities, or indirectly, by increasing pressure for agricultural intensification.

2.5 International regulations and policies addressing the biodiversity-climate nexus

Climate frameworks are far ahead in their development compared to biodiversity frameworks. The biggest one, the Paris Agreement, was followed by a flurry of sovereign and corporate net-zero frameworks. For biodiversity, the Global Biodiversity Framework (GBF) was a Paris-equivalent agreement and major milestone (see box below). But it hasn't been followed yet by the same wave of commitments as the Paris Agreement has.

Nevertheless, the fact that the climate and biodiversity crises are interrelated and will need coordinated action is becoming commonly understood. Regionally, there are a few regulations that require financial institutions and corporates to address the nexus. For example, in the EU, the EU Taxonomy was extended to include biodiversity, water, circular economy, and pollution as sustainability objectives. These objectives, approved in June 2023, will be integrated into the Corporate Sustainability Reporting Directive (CSRD) by 2024.

In regard to the nexus, this regulation represents a significant momentum that pushes both awareness of biodiversity issues and an understanding of the link between climate and nature.

On the policy front, the EU's biodiversity strategy for 2030 aims to build resilience against both climate change and ecosystem degradation among others. In March 2023, the EU Commission published two sets of guidelines on forests – to ensure that afforestation, reforestation, and tree-planting projects are biodiversity friendly. The EU's Net Zero Industry Act, announced in March 2023, requires environmental assessments of all net-zero strategic projects in relation to water, air, ecosystems, habitats, biodiversity and birds.

Beyond the EU, the Canadian Sustainable Agriculture Strategy aims to encourage the agriculture sector to take action on environmental and climate issues, while providing the vital role of responding to growing demands for healthy and affordable food and supporting economic growth. Its focus areas are climate change mitigation, biodiversity and water, among others.

In the US, President Biden's Executive Order on Strengthening the Nation's Forests, Communities and Local Economies aims to "enlist nature to address the climate crisis with comprehensive efforts to deploy nature-based solutions that reduce emissions and build resilience".

At COP27, the Biden-Harris Administration released the Nature-Based Solutions Roadmap, outlining strategic recommendations to unlock the full potential of Nature-based Solutions (NbS) to address climate change, nature loss and inequity. Most policy actions seem to only address specific areas of the nexus, like agriculture, oceans, or NbS. From a financial institution's perspective, only the EU taxonomy and CSRD seem to require immediate actions to address and report on nexus issues.

The recently launched UN Decade on Ecosystem Restoration, which is a call for the protection and revival of ecosystems all around the world, can provide a common objective for the UNFCCC and the Convention on Biological Diversity (CBD) to develop further actions.

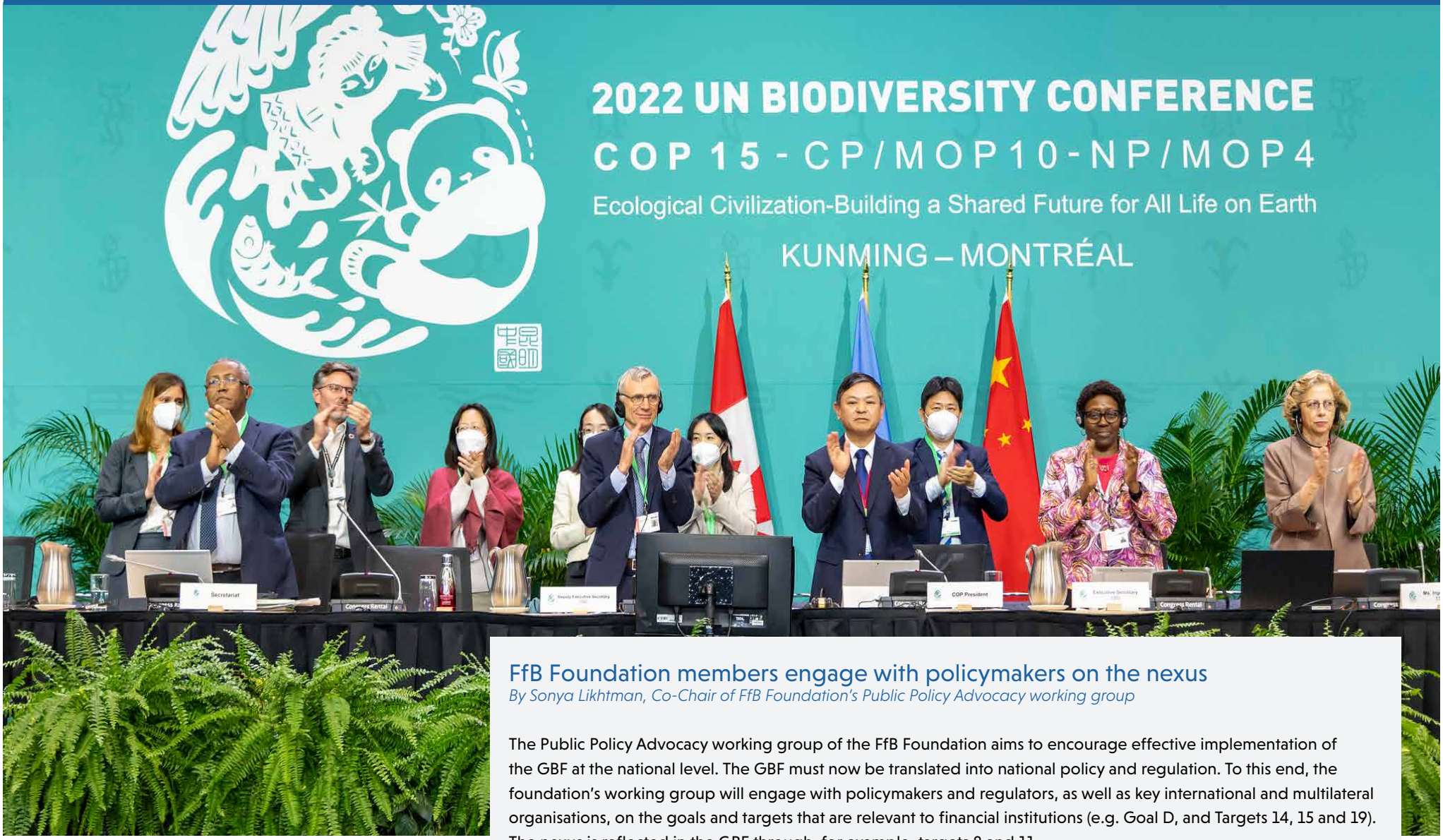
Global Biodiversity Framework and its linkage with climate

On December 19th, 2022, the Conference of the Parties (COP15) to the Convention on Biological Diversity signed the post-2020 GBF. This agreement includes four long-term goals for 2050 and 23 action-oriented targets for 2030, of which target 2 aims to restore 30% of degraded land, water, marine and coastal ecosystems, and target 3 aims to have 30% of terrestrial, water, coastal and marine areas under conservation and managed by 2030.

In particular, targets 7 and 8 address the nexus:

- Target #7: To reduce the overall risk from pesticides and highly hazardous chemicals by at least half
- Target #8: Minimise the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation and disaster risk reduction actions, including through Nature-based Solutions

Additionally, target 15 calls for increased regulations at the government level and disclosure from financial institutions, while target 19 calls for an increasing amount of funding towards biodiversity projects, at least USD200 billion each year by 2030. This means that for already existing climate plans and projects, additional funds for biodiversity need to be mobilised. For example, countries that signed the Paris Agreement submitted their 'Nationally Determined Contributions', or climate change mitigation plans in 2020, which did not necessarily include goals to reduce their impact on nature. The GBF can help countries filling this gap, building resilience of nations and decreasing carbon emissions.



FfB Foundation members engage with policymakers on the nexus

By Sonya Likhtman, Co-Chair of FfB Foundation's Public Policy Advocacy working group

The Public Policy Advocacy working group of the FfB Foundation aims to encourage effective implementation of the GBF at the national level. The GBF must now be translated into national policy and regulation. To this end, the foundation's working group will engage with policymakers and regulators, as well as key international and multilateral organisations, on the goals and targets that are relevant to financial institutions (e.g. Goal D, and Targets 14, 15 and 19). The nexus is reflected in the GBF through, for example, targets 8 and 11.

The working group thinks it is critical for policymakers and regulators to consider biodiversity alongside climate change in their approaches, as the issues are closely interlinked. This includes addressing both synergies and trade-offs between climate change and biodiversity.

3. Synergies and trade-offs of key nexus solutions

The nexus, i.e. the interplay between climate change and biodiversity, as explained in chapter 2, takes place as part of the investment or lending actions by financial institutions.

There is almost always some level of interaction between climate and biodiversity activities and solutions, and these can be both negative or positive. Building on the pillars of chapter 2, we have attempted to analyse these interactions and identified the synergies and trade-offs that some of the key climate and nature solutions provide.

We analysed Nature-based Solutions (NbS), agricultural solutions, alternative energy sources and circular economy solutions, as we deem these examples to be important solutions to establish sustainable, net-zero carbon economies. Each solution can play a fundamental role in shifting economies away from a fossil-fuel-based infrastructure to a sustainable one if the synergies and trade-offs between climate and biodiversity are well managed.

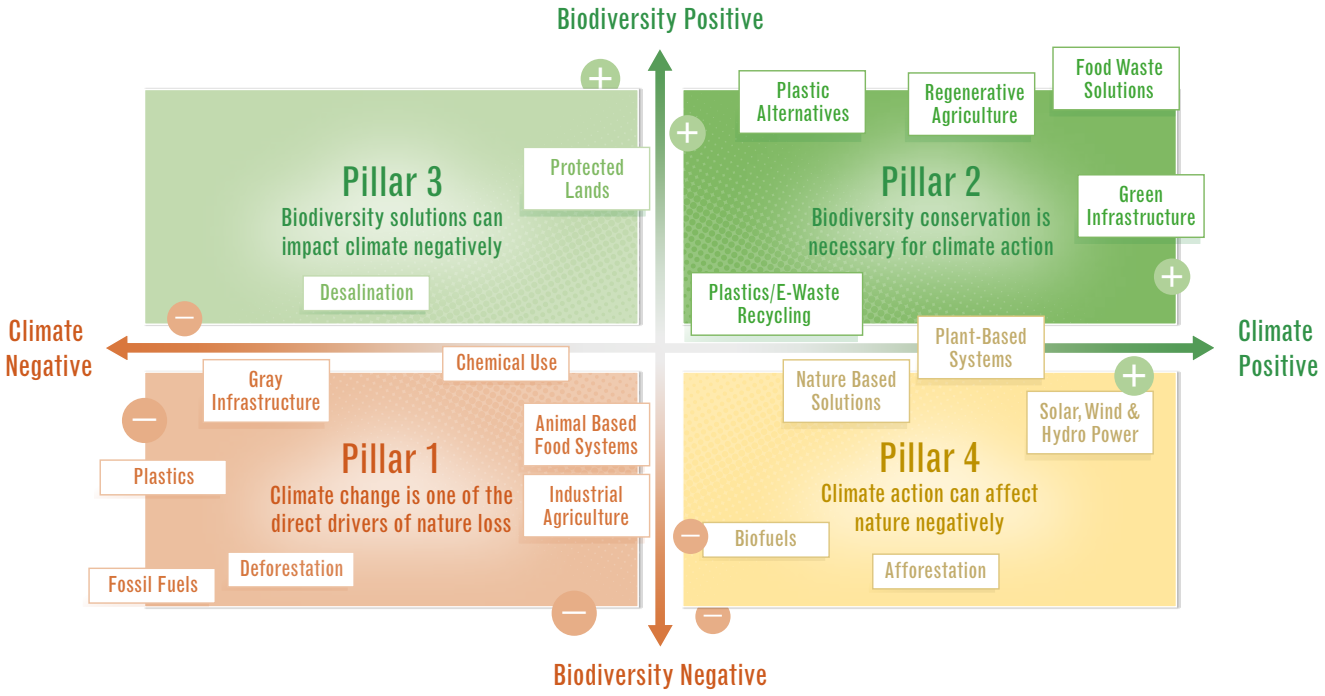
Based on the given examples, we have developed key recommendations, which are summarised after each point and from which we distilled high-level recommendations explained in chapter 4.

Figure 4. Mapping biodiversity-climate nexus solutions against pillars and synergies and trade offs.

Please note: The graph is not exhaustive, and not based on any quantitative basis. It should only serve as a conceptual tool to understand the Biodiversity-Climate Nexus.

The bottom left quartile (Pillar 1) represents the common human activities that have led to both climate change and biodiversity loss. The top right quartile (Pillar 2) shows activities/businesses that predominantly present synergies (although they could have some trade-offs as discussed in the next chapter/s).

The quartiles on top-left (Pillar 3) and bottom-right (Pillar 4) represent the solutions for reducing either biodiversity loss or climate change while also being exposed to trade-offs.



3.1 Nature-based Solutions foster climate and biodiversity action

The Nature-Based Solutions for Climate Manifesto, developed for the UN Climate Action Summit in 2019, highlights Nature-based Solutions (NbS) as a fundamental part of climate and biodiversity action.

NbS are "actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously benefiting people and nature", according to the International Union for Conservation of Nature and Natural Resources (IUCN).

Recommendation for Nature-based Solutions

We recommend that financial institutions support investments in NbS, as they provide a direct way to exploit the synergies between nature and climate (see chapter 4.1). But NbS are not always the silver bullet and can lead to disadvantages for biodiversity and trade-offs. It is highly important that financial institutions adopt a "Do No Significant Harm (DNSH)" approach for NbS to avoid negative externalities, including in regard to biodiversity.

When it comes to offsetting projects, we advise financial institutions to be vigilant in regard to the quality of these by using verified benchmarks and certifications and to ensure that they represent only a very small part of a company's emissions management plan (see box of chapter 4.1).

NbS include solutions such as using water filters or rehabilitating water sources and restoring forested areas/ afforestation and coral reefs – projects which protect biodiversity, but which are also a solution to climate change.

The Manifesto cites research showing that NbS, by unlocking the mitigation potential of nature, can provide over one-third of the cost-effective climate mitigation needed between now and 2030 to stabilise warming to below 2°C.

A finance gap of an estimated USD8.1 trillion needs to be filled with NbS by 2050 for the world to remain on track to meet the Paris Climate Agreement (UNEP, 2021). Today, more than 130 countries have already included NbS in their national climate plans for the Paris Agreement.

Financial institutions and companies can buy carbon credits for NbS and thereby finance these. Carbon credits are measurable, verifiable emission reductions from projects, which restore natural ecosystems and represent natural carbon sinks.

NbS for carbon credits can have additional collateral benefits for biodiversity and nature protection; for example, water-related projects, such as supplying drinking water to local populations. Without such projects, populations would collect and burn wood to boil the water and make it drinkable, thereby emitting carbon.

However, carbon-credit-related projects may also present some trade-offs and generate negative impacts on biodiversity and nature. For example, reforestation where it is not needed, monoculture forests, or planting non-native trees to offset carbon emissions, can be detrimental to biodiversity and even reduce the availability of water. The potential climate benefits don't outweigh the nature-related costs.

Currently, setting up NbS projects of good quality is a complex process, as land targeted for NbS may be occupied by several owners. Additionality, where projects perform above business-as-usual, is among the most important criteria for project selection; for instance, the area to be reforested needs to be classified as a restoration project, so that it can be defined as additional. As of today, the high demand for such projects exceeds available offers and drives price inflation.

Driving investments into NbS with the Ocean Risk Resilience Action Alliance (ORRAA)

The Ocean Risk and Resilience Action Alliance (ORRAA) was established at the margins of the 2018 Ocean Risk Summit in response to a greater need for the insurance sector to reduce exposure and vulnerability of coastal communities and Small Island Developing States (SIDS).

Its aim is to drive USD500 million of investments into NbS by 2030, and surface at least 50 novel finance and insurance products which incentivise private and blended finance for coastal natural capital. Among its flagship projects is the development of a modelling tool called the Coastal Risk Index together with insurance firm AXA XL. The tool integrates the protective benefits of coastal ecosystems into risk models to drive a systemic shift towards NbS.

3.2 Agricultural solutions work against vicious cycle

Agriculture is the "largest global source of ecosystem degradation and biodiversity loss, the largest water user and a key driver of climate change", according to a 2023 report by The Food and Land Use Coalition (FOLU). Most food systems currently prioritise making cheap, plentiful food, which often relies on unstainable production practices.

The projected rise in world population to 9.8 billion people in 2050 (UN Department of Economic and Social Affairs) and the consequent need to substantially increase global food production by 70% (Food and Agriculture Organisation [FAO] of the UN) exacerbates the competition in land use between forest and agriculture.

Agriculture, climate change and biodiversity loss are highly interconnected and reinforce negative effects between each other. Climate change is predicted to reduce major crop yields by roughly 3–7% for every 1°C degree increase in temperature (PNAS, 2017). Rising heat and water stress increase the incidence of pests and diseases during agricultural production, leading to higher use of chemicals in the industry. The loss of insects as well as other biodiversity is estimated to have led to a loss of crop productivity of at least 75% (FAO, 2021). Loss of agrobiodiversity increases the vulnerability of crops to climate change and reduces the levels of nutrients in plant-based foods.

Soil erosion poses a significant threat to food security, as nutrients and crop yields decline (Environment International, 2019).

Among the existing agricultural solutions seeking to address this vicious cycle are to support regenerative agriculture, set up protected areas for biodiversity conservation, implement plant-based systems and work against food waste.

Regenerative agriculture

Regenerative agriculture is gaining rising interest among agri-food industry leaders, civil society organisations and farming communities as a potential solution to the negative impacts caused by industrial farming. Although a universal definition does not exist, regenerative agricultural practices generally aim to improve soil health, enhance water infiltration and storage, increase the resilience of farms and reduce erosion and reliance on chemical inputs compared to industrial agricultural systems.

Many regenerative agricultural practices can have a positive impact on on-farm biodiversity and on-farm carbon sequestration. Protecting and sustainably using our topsoil through, for example regenerative agriculture, could increase food production to up to 58 %, the Food and Agriculture Organisation (FAO) of the UN suggests.

But effects of regenerative agricultural practices on yield have been found to be highly variable, and effects on off-farm net GHG emissions are mixed. Some regenerative agricultural practices have also been found to lead to a yield decline. It is critical to develop and deploy new technologies to sustainably enhance food and nutrition security and productivity and transform current food consumption, marketing and distribution patterns.

Whether the actual impacts of agriculture-related investments are positive needs to be analysed at an ecosystem level, based on actual results and take bio-socio-economic aspects into consideration.

Restoring and protecting ecosystems: Nestlé

Nestlé has been using data from satellite-based service Starling to monitor deforestation in its palm oil, pulp and paper and cocoa supply chains. The company announced that it will apply a similar approach to its forest restoration and regeneration initiatives.

Through its farmer connect programmes, Nestlé also works with local farmers to support them in adopting regenerative farming practices.

Its support includes providing technical assistance and expertise as well as exploring suitable regenerative agriculture methods.

Source: Nestlé in Society report 2022.

Food waste, plant-based systems, protected areas

By limiting food waste, substantial synergies can be created. Any food that is produced and wasted is a contributor to increasing global warming. Each year, approximately one-third of all food produced for human consumption in the world is lost or wasted (The Food and Agriculture Organisation [FAO], 2013).

The global carbon footprint, excluding land use change, was estimated at 3.3 gigatonnes of CO_2 equivalent in 2007 (FAO, 2013). Loss of food is also problematic considering the water and the land that went into producing the food.

Plant-based systems and protected areas for biodiversity conservation are agricultural solutions which can lead to significant trade-offs and unintended consequences if they are not implemented with care. This is due to the competing demands of using land for either food production or biodiversity conservation.

Yet, in comparison to meat-based food systems, plant-based systems are important levers for climate change adaptation and mitigation. Plant-based systems have a lower effect on climate change, as meat-based food systems consume more agricultural materials for food, forage, and pharmaceuticals etc. for mass livestock.

By designing protected areas for biodiversity conservation, rare and threatened species can be safeguarded from further exploitation by humans. Target 3 of the GBF aims to accomplish that by 2030 at least 30% of terrestrial, inland water, marine and coastal areas, especially those of particular importance for biodiversity and ecosystem functions and services, are effectively conserved.

There is also an increasing demand for protected areas to provide additional functions next to food security, such as supporting the livelihoods of local communities, providing ecosystem services and/or mitigating the effects of climate change.

Recommendation for agricultural solutions

Agriculture is a high-risk and high-impact sector (see also chapter 4.2) for biodiversity and climate change, and we advise financial institutions to prioritise it when they seek to address the nexus. Regarding regenerative agriculture we recommend to financial institutions to encourage corporates to provide a clear definition of their approach and to target, measure, assess, scale and monitor regenerative agricultural practices and actual results on the ground.

Synergies can be captured and trade-offs can be managed by engaging with companies on their specific strategies (see chapter 4.3). Engagement activities can refer to outcome metrics suggested by The Global Farm Metric, which is a framework supported by multi-stakeholders to understand, measure and monitor the state of farming systems globally.

The credibility of a company's strategy on regenerative agriculture can also be measured by:

- Prioritising deforestation-linked commodities in materiality assessments of the supply chain;
- Setting SBTN land-related targets for land-use change mitigation, land footprint reduction and engagement with farmers on positive practices, such as regenerative agriculture and grown crop sourcing targets as a share of total inputs;
- Issuing scorecards on regenerative practices, and using online digital tools, supporting farmers in assessing their progress;
- Referring to third-party KPIs, such as regenerative and restorative practices by the One Planet Business for Biodiversity (OP2B) initiative;
- Offering price premium programmes to farmers and engaging with them to change their practices (Boston Consulting Group, 2023); and
- Auditing progress and disclosing results.

Recommendation for agricultural solutions

To fundamentally address the trade-offs between either seeking to protect the environment or food security, investee companies and project managers could ideally go even a step further. They could make spatially detailed and context-specific impact assessments to understand the possible outcomes of different cropland expansion projects. This could also include examining (1) how the expected global cropland expansion might affect food security in terms of agricultural production and prices; (2) where natural conditions are suitable for cropland expansion under changing climate conditions; and (3) whether this potential conversion to cropland would affect areas of high biodiversity value and by how much.

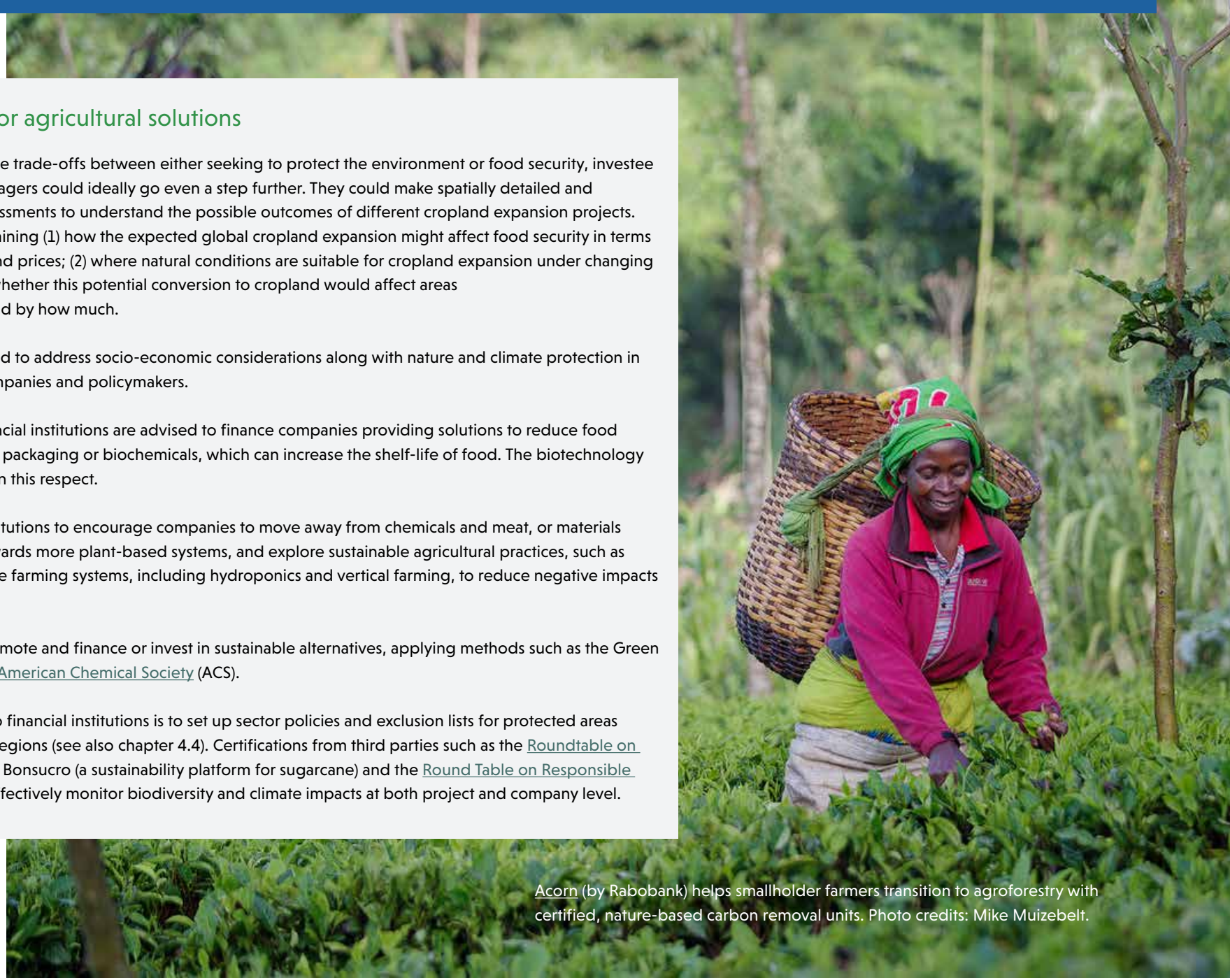
Financial institutions will need to address socio-economic considerations along with nature and climate protection in their engagements with companies and policymakers.

In terms of food waste, financial institutions are advised to finance companies providing solutions to reduce food waste, including sustainable packaging or biochemicals, which can increase the shelf-life of food. The biotechnology sector has a large potential in this respect.

We also advise financial institutions to encourage companies to move away from chemicals and meat, or materials produced from animals, towards more plant-based systems, and explore sustainable agricultural practices, such as precision farming, alternative farming systems, including hydroponics and vertical farming, to reduce negative impacts on nature.

Financial institutions can promote and finance or invest in sustainable alternatives, applying methods such as the Green Chemistry principles by the American Chemical Society (ACS).

Another recommendation to financial institutions is to set up sector policies and exclusion lists for protected areas related to specific crops or regions (see also chapter 4.4). Certifications from third parties such as the Roundtable on Sustainable Palm Oil (RSPO), Bonsucro (a sustainability platform for sugarcane) and the Round Table on Responsible Soy (RTRS) can be used to effectively monitor biodiversity and climate impacts at both project and company level.



Acorn (by Rabobank) helps smallholder farmers transition to agroforestry with certified, nature-based carbon removal units. Photo credits: Mike Muizebelt.

3.3 Alternative energy sources require management

To confine global warming to 1.5°C and avoid the most catastrophic effects of climate change, CO_2 emissions must reach net zero by 2050, and fossil fuel production must decline. Renewable energy sources such as solar, wind, hydroelectric, biomass, geothermal, tidal, ocean, and osmotic are among the most effective methods to decarbonise economies. The share of renewables in the global power generation mix is forecasted to rise from 29% in 2022 to 35% in 2025 (International Energy Agency [IEA], 2023).

But, if poorly managed, the growth of renewable energy projects may cause additional loss of biodiversity (IUCN, 2021). Hydroelectricity is often cited as a case in point, as artificial reservoirs can contribute to habitat loss for species – though it is estimated that much of these impacts could be avoided through careful site selection (Scientific Reports, 2020). Renewable energy technologies may also generate substantial biodiversity impacts when raw materials for these are extracted.

As the most common forms of renewable energy in the global energy mix, we have looked at the trade-offs of solar, wind, hydropower and biofuels. Given the discussions on the potential of nuclear energy to help the net-zero transition, we added information on this point as well.

Solar, wind and hydropower

Some of the potential negative biodiversity impacts of solar power plants, onshore wind turbines and reservoir-based hydropower are:

- Habitat loss through clearance or displacement of terrestrial and freshwater ecosystems;
- Resource exploitation in terms of land use and water consumption;
- Wildlife mortality (of birds, bats, reptiles, etc.) through collisions, electrocution or because of the attraction of wildlife to evaporation ponds;
- Barrier effects and fragmentation of wildlife habitat; and
- Flooding and pollution (dust, light, noise and vibration, solid/liquid waste).

Offshore wind turbines can cause additional effects like seabed habitat loss and hydrodynamic changes (bottom-fixed turbines) when foundations are installed, potentially affecting fish species and ethnic communities. Meanwhile, evidence shows that offshore wind farms can have positive biodiversity impacts, including the introduction of new habitats, artificial reef effects and a fishery 'reserve effect' where marine fauna tend to aggregate due to the exclusion of fishing.

There is still much to understand on the impacts of the above-mentioned forms of renewable energy, but it is clear that they must be considered carefully at all stages of project planning and development. Good restoration practices include, for example, to revegetate temporary-use and lay-down areas as soon as possible after construction activities have been completed, and separately retain and store topsoil and sub-soil stripped from the construction areas for later use during reinstatement.

Other recommended measures are the use of technology that can temporarily shut down selected wind turbines to protect birds and other species at particularly active times, or when they are detected in the vicinity by field observers, image-based detection or radar systems (IUCN, 2021).

Orsted on its nature-related commitments for offshore wind farms

Orsted, the largest offshore wind farm developer in the world, explains that choosing a suitable location during the development phase is crucial to protect marine and coastal ecosystems. Sometimes the decision comes from public authorities, but when Orsted can influence the location, it is undertaking some environmental impact assessments of the site.

Its main commitments are to:

- ensure that, if it is authorised to do so, the locations of offshore wind farms are appropriately and responsibly selected;
- ensure that it reduces any significant impacts on sensitive species and ecosystems within predetermined sites;
- mitigate potential impacts due to underwater noise from piling foundations; and
- reduce impacts on seabed and coastal ecosystems to a minimum.

Biofuels

Global demand for biofuels is predicted to increase by 28% between 2021 and 2026, (International Energy Agency [IEA], 2021). In 2020, biofuels represented about 6% of global biofuel demand, while in the Net Zero Scenario, biofuel demand roughly doubles to 14% by 2026.

Countries are looking to increase the amount of biofuels in their energy mix to combat climate change and strengthen their energy security and the development of rural areas.

Biofuel crops, like sugarcane or palm oil, can have a negative impact on biodiversity, whether they directly convert natural ecosystems or indirectly convert non-degraded land. In the tropics, biofuel production has caused the loss of tropical forests and wetlands, and in temperate regions, it has encroached into protected areas, destroying natural habitats and leading to close to two hundred of species becoming endangered (IUCN, 2018). Biofuel feedstock plantations (especially palm oil and maize plantations) can also cause soil erosion and the pollution of watercourses.

The trade-offs from biofuel production on ecosystems can be contained when the appropriate crops are grown in suitable areas, but it is not generally the case. In Latin America, for example, it has been reported that sugarcane cultivation for ethanol production is encroaching heavily into Cerrado and Atlantic Forest biomes, two severely threatened biodiversity hotspots (Land, 2020). Despite the EU's plan to phase out palm oil by 2030, the share of Europe's palm and soy oil imports used for biodiesel fuel is increasing. The EU imported 4 million tonnes of crude palm oil and 3.5 million tonnes of refined palm and soy oil diesel from Southeast Asia and South America, areas of severely endangered species and where some of the most diverse ecosystems can be found (Rainforest Rescue, 2018).

Paradoxically, using palm oil or soy for biodiesel is not a win for climate change. Palm oil biodiesel releases three times the amount of greenhouse gas emissions compared to fossil diesel, while soy releases twice as much (European Federation for Transport and Environment).

An investigation into an industrial palm oil project in Cameroon: The GREENFIL project

Located in Nkam department, Littoral Province of Cameroon, the Greenfil palm oil project is estimated to cover 34,500 ha (The Rainforest Foundation UK, 2019).

The company Nana Bouba Group initiated in 2012 a process to acquire large agricultural land in the Littoral region of Cameroon. By 2017, more than 1000 hectares had been cleared. There is some concern of the potential absence of a forest inventory analysis, despite this being a requirement in Cameroon's forest law. The report also mentions allegations that inadequate information was spread, including during the consultation of communities. The known maps of the project cover 11 villages which are home to an ethnical diverse population that relies mostly on agriculture and fishing.

The Greenfil project is allegedly clearing forests very close to the 142,000 ha Ebo forest, one of the most biodiverse places in Cameroon. This forest is home to a wide variety of wildlife such as western gorillas, the rare Nigeria-Cameroon chimpanzee and several other primate species, including a large population of drills as well as a wide variety of endemic plant species. There is also some concern on water management, as the project area includes the Ndogbanguengue river and other streams used by local communities for drinking water and fishing. When wastewater from the palm oil fields is discharged, the use of fertilizers can alter the quality of the water, making it unfit for drinking and uninhabitable for fish and plant species.

Nuclear energy

Nuclear energy currently forms circa 10% of our global energy mix (Our World in Data) and is widely used as a low-carbon alternative while producing zero air pollution during operations. The land footprints of wind, solar and hydropower are dozens to hundreds of times larger than that of nuclear power, which has similar or even lower GHG emissions (Biological Conservation, 2022).

However, nuclear energy has its own pitfalls. A major environmental concern related to nuclear power is the creation of radioactive waste, such as spent reactor fuels and other radioactive waste from the operation, maintenance and decommissioning of a plant. Some of this waste can remain radioactive and dangerous for the environment for thousands of years (U.S. Energy Information Administration).

Just one uncontrolled nuclear reaction in a nuclear reactor can result in widespread destruction and contamination of air and water, which can be detrimental to the health of all species in local and wider areas (Conservation Letters, 2011). Nuclear accidents can be caused by the failure of technical components, by natural disasters, by human error, and a mixture of these among others (Three Mile Island, 1979; Chernobyl, 1986; Fukushima, 2011). Countries at war can suffer from heightened risks of a nuclear disaster.

The immense trade-offs from radioactivity from nuclear disasters and nuclear waste are so large that nuclear energy is highly controversial and not widely accepted as a green energy form.

Recommendation for alternative energy sources

We advise financial institutions to undertake holistic environmental and social impact assessments of renewable energy and biofuel projects before making decisions on whether to finance, invest in a project, or provide lending to it. The impacts of biofuels on biodiversity will depend greatly on the type of crops that are planted, where they are planted, and how the land was previously used.

We recommend to financial institutions to require life-cycle assessments and location-based analyses from project managers, developers and companies they finance or invest in to help mitigate trade-offs.

Financial institutions can minimise trade-offs from renewable energy by investing in or financing companies applying holistic environmental management systems, which include sustainable restoration practices. Engagement activities can include socio-economic considerations and extended producer responsibility (see also point 4.4) to promote circular renewable energy solutions and tackle issues around a product's end-of-life.

To limit the trade-offs, we suggest to financial institutions to use sector policies and exclusion lists (see chapter 4.4). For example, infrastructure investors should choose solar and wind farm installations, which exclude areas of high environmental significance, such as protected and conserved areas, World Heritage Sites and key biodiversity areas. Exclusion lists communicated as part of engagement dialogues can motivate companies to change their behaviour, by excluding them from investee portfolios as long as they don't consider protecting biodiversity.

Financial institutions are advised to require from companies to use eco-labels or certified sustainability standards or select investments or projects which apply these. Several initiatives such as the Roundtable on Sustainable Biomaterials (RSB), Bonsucro (a platform for sugarcane), the Round Table on Responsible Soy (RTRS) and the Roundtable on Sustainable Palm Oil (RSPO) promote sustainability standards and criteria for biofuel/feedstock production. RSB's Global Fuel Certification, for example, ensures that biofuel production (anywhere except for the EU) follows its 12 sustainability principles, i.e. including greenhouse gas emission reductions while not contributing to issues like deforestation or global hunger etc.

Financing advanced fuels – such as biofuels from end-of-life products, by-products and residues (biogenic), waste-based fossil fuels, renewable liquid and gaseous fuels of non-biological origin – could provide much-needed circular economy synergies among others.

Financial institutions are encouraged to ensure that companies or project managers are mitigating the negative impacts of investments or their lending as effectively as possible and target the opportunities for synergies that the nexus holds through engagement.

3.4 Circular economy holds key to solving the nexus

Transforming to a circular economy model is believed to be a key response in resolving several pressing sustainable challenges, including climate change and a sustainable environment in line with the UN Sustainable Development Goal 12 (see also Circular Economy and Sustainability, 2021). Circular economy strategies could help reduce emissions by 40% in 2050 (Ellen McArthur Foundation, 2021).

The framework by the Ellen McArthur Foundation applies the 5 Rs rule: Reduce; Reuse; Refurbish; Repair; and Recycle. It is based on three key design principles – eliminating waste and pollution, circulating products and materials and regenerating nature – which play an important role in halting and reversing biodiversity loss and reducing carbon footprints.

Despite the numerous benefits of the circular economy to prevent biodiversity loss and climate change, there are some trade-offs to consider. For example, even though circular practices may reduce greenhouse gases derived from virgin materials, they may also increase energy use and GHG emissions during the recycling process or during collection, transport and processing of materials to be recycled. Nevertheless, the net environmental benefit of recycling over landfilling remains positive (Ellen McArthur Foundation, 2021). To mitigate or limit trade-offs, low-carbon solutions and energy efficiency can be incorporated into the value chain.

Plastics recycling

Circular economy practices can help minimise plastic use and waste by promoting the recycling and reuse of plastic products. Among the major industries that are using recycled plastics as raw materials are the textiles and construction industries.

As the fashion industry seeks to become more sustainable, the use of recycled polyester is becoming increasingly popular. Recycled polyester uses plastic bottle waste made from Polyethylene terephthalate (PET) bottles, a form of polyester. This reduces the need for virgin materials and decreases land/water use and GHG emissions from raw material production. One trade-off, however, associated with the reuse and recycling of textiles, such as recycled polyester, is that it may lead to the substitution of more sustainable materials, such as organic cotton or bamboo (when sourced sustainably). It is important that the materials for recycled polyester are sourced and processed in a sustainable way and do not replace sustainable alternatives where possible (Guardian). This would also allow to avoid rebound effects, where gains from reductions of virgin materials are offset by a higher consumption of products.

However, the release of microplastics into the environment can still occur even if plastics have been recycled sustainably. Therefore, effective end-of-use collection is highly important to capture some of the benefits of plastic recycling. Another challenge is that recycled plastics can accumulate additives, such as stabilisers and ink that can be toxic and unsuitable for certain use-cases. The EU has restricted the use of recycled plastics for packaging that is in contact with food, with the exception of some closed-looped PET bottles. It should also be noted that recycled plastic can have negative impacts on the surrounding if the building of recycling plants leads to the destruction of natural habitats or the displacement of local communities.

Plastic alternatives

Alternatives to plastics such as 'bioplastics' are increasingly popular and reduce the trade-offs between sustainability and durability. Bioplastics are made from renewable resources and can be biodegradable, depending on the polymer. Biodegradable bioplastics that are sustainably sourced also promote safer solutions to the environment and do less harm to ecosystems. But not all types of bioplastics are able to degrade efficiently (National Geographic). Some require high-temperature industrial compost technology to effectively activate the microbes, others can remain in the landfill or compost for long periods. Therefore, to mitigate trade-offs, sustainable sourcing of feedstock is essential and bioplastics need to be recycled in a sustainable way (European Bioplastics).

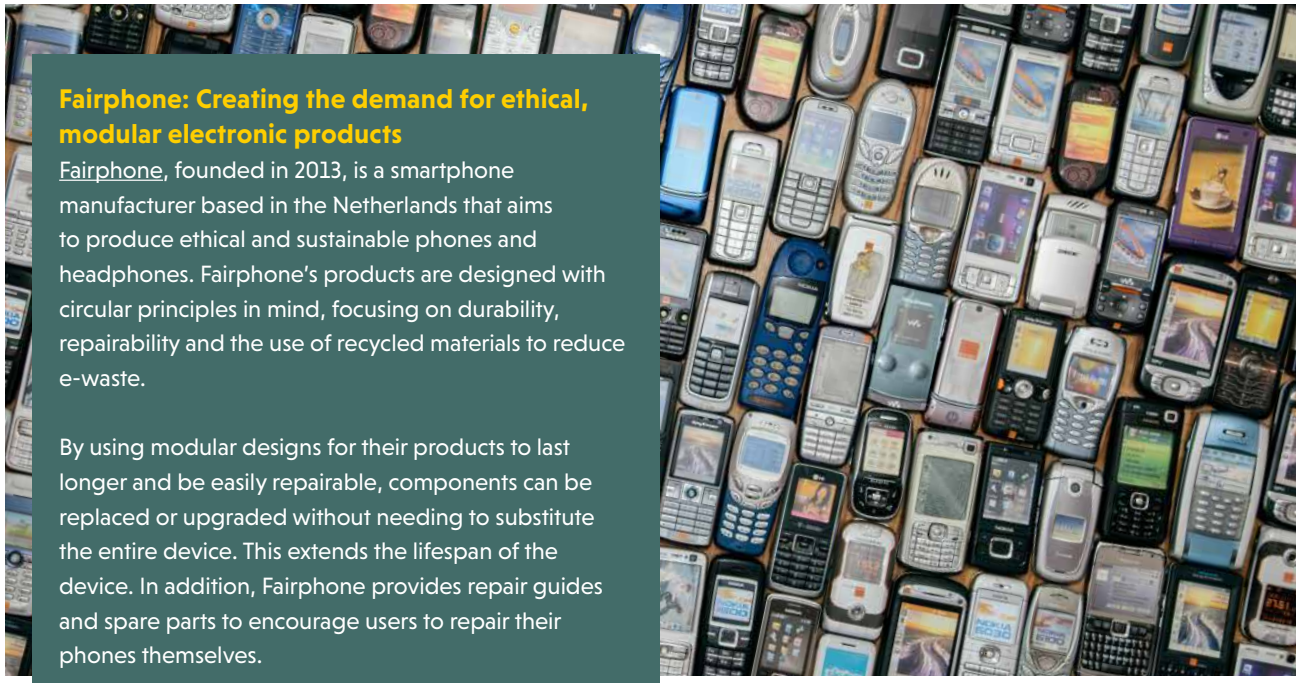
Yet, achieving a sustainable impact requires more considerations. Even when produced with renewable materials, bioplastics can require large areas of land and a lot of water leading to deforestation, habitat loss, water stress and other negative impacts on biodiversity, and add to the competition with food production (Nature Reviews Materials, 2022).

Sustainably farmed seaweed-based products have been assessed as a possible win-win alternative for plastics. Seaweed is both naturally occurring and a carbon-capturing material (World Economic Forum). It is derived from seaweed farms and can contribute positively to biodiversity, climate and our economies. As the seaweed market develops, unsustainable practices can cause negative impacts on the environment. Therefore, when supporting seaweed farm opportunities or when sourcing products, proper standards need to be followed (Forbes).

E-waste recycling

Electrical and electronic devices generate millions of tonnes of waste every year. To help promote circular practices to limit e-waste, the EU implemented the Waste from Electrical and Electronic Equipment (WEEE) Directive, which aims to control this fast-growing waste stream. Circular practices, by reusing and repairing electronic equipment, can help reduce electronic waste and mitigate its impacts on climate change and biodiversity, such as soil and water pollution.

Many of the materials of electronic devices are rare earth metals that hold value and are possible to be reused or recycled. Circularity, by design, can also improve resource efficiency and decrease waste, as it reduces the need for virgin materials. Many technology and telecommunication companies have e-waste recycling schemes, and are increasingly using sustainable production and modular designs to increase the lifespan of electronic devices. These methods can reduce GHG emissions in the production and use phase, reduce e-waste and reduce the impact on nature from mining rare earth metals. For example, extending the lifespan of a mobile phone from 18 months to four years could result in a 40% reduction in CO_2 emissions (Open Access Government).



Fairphone: Creating the demand for ethical, modular electronic products

Fairphone, founded in 2013, is a smartphone manufacturer based in the Netherlands that aims to produce ethical and sustainable phones and headphones. Fairphone's products are designed with circular principles in mind, focusing on durability, repairability and the use of recycled materials to reduce e-waste.

By using modular designs for their products to last longer and be easily repairable, components can be replaced or upgraded without needing to substitute the entire device. This extends the lifespan of the device. In addition, Fairphone provides repair guides and spare parts to encourage users to repair their phones themselves.

Recommendation for circular economy solutions

We recommend to financial institutions to engage with companies to transition to a circular economy and finance circular solutions directly (see chapter 4.3). We advise that the product end-of-life is managed before products are launched (e.g. design) and that companies are encouraged to adopt a circular design and right-to-repair policy. All decisions need to be backed with a life-cycle analysis and an impact assessment on both nature and climate to ensure that the chosen solution doesn't pose additional or even bigger threats to the environment.

Via collaborative engagements, financial institutions are advised to target national regulation on extended producer responsibility to promote circular economy solutions and the removal of laws that create barriers and hinder the ability of business models to effectively transition to a circular economy. Financial institutions can also pool efforts and encourage sector initiatives on R&D and innovative solutions and help to scale up recycling technologies through financing such projects.

We also suggest to support companies with incorporating low-carbon solutions and energy efficiency in their value chains to mitigate trade-offs from high-carbon energy sources used during recycling processes.

Solution category	Trade-offs +	Synergies -	Recommendations
Nature-based Solution	Reduced quality of ecosystem creation (if not properly planned and managed)	Climate mitigation, ecosystem integrity, disaster risk reduction, water and food security, human health	Adopt "Do No Significant Harm" principle; regarding carbon offsetting, use verified benchmarks and certifications, but should only represent a very small part of companies emission reductions.
Carbon credits/carbon off-setting	Imbalance of land use, biodiversity dilution, water depletion, financial impact		
Protected areas	Food security	Climate mitigation, ecosystem integrity	• Conduct environmental impact and price assessments to determine how the location of the cropland impacts climate, nature and society. • Promote avoidance of chemicals and encourage plant-based systems based on sustainable agriculture practices including precision farming, regenerative agriculture, alternative farming. • For regenerative agriculture ensure actual results on the ground from companies. • Regarding food waste invest in companies that reduce food waste including sustainable packaging or biochemicals (see circular economy section for further guidance on packaging).
Plant-based systems	Land use change, resource use	Climate mitigation, water conservation, ecosystem integrity	
Regenerative agriculture	Land use change, resource use (if done on protected land)		
Food waste solutions	None	Food security, climate mitigation, ecosystem integrity, reduced dependency	
Solar, wind and hydropower	Land use change, habitat loss, stress or mortality of wildlife, water depletion, environmental contamination, ecosystem integrity	Climate mitigation, air quality, ocean reef ecosystems	• Conduct a holistic environmental and life-cycle assessment and management for renewable energy projects, including a location-based analysis. • Include socio-economic considerations during analysis and engagement. • Use reputable eco-labels or certified sustainability standards to analyse and engage with companies. • Use biofuels of non-biological origin derived from waste and by-products to reduce dependency on nature.
Biofuels	Land use change and degradation, climate change (palm oil or soy for biodiesel)	Climate mitigation (sustainable biofuels)	
Nuclear energy	Health of living things (including humans)	Climate mitigation, reduced land use change	
Plastic recycling	Energy consumption, pollution, resource use (when sourced unsustainably)	Climate mitigation, ecosystem integrity, resource use	• Promote circularity in the early design stage, including module structures and long lifespan. • Include life-cycle analysis and impact assessment on both nature and climate to avoid rebound effects. • Engage with national authorities for tighter regulations on circular economy solutions removing laws that create barriers. • Support R&D and innovative start-ups to help scale up recycling and reuse/repurpose technologies.
Plastic alternatives	Land use, water security, impact on habitats, food security, ecosystem integrity (if not properly managed)	Ecosystem integrity	
Seaweed-based products	Win-win solution but negative impacts on ecosystem can occur when managed unsustainably	Climate mitigation, ecosystem integrity, resource use	
E-waste recycling	Local emissions from recycling	Ecosystem integrity, climate mitigation	

Table 1: Overview of analysed solutions, their trade-offs, synergies and measures to optimise their impact on the environment.

4. How financial institutions can address the nexus

We recommend to financial institutions to integrate the synergies and trade-offs of the biodiversity-climate nexus into every step of their strategic planning and business processes. The nexus has implications (in terms of risks and opportunities) for analytical activities, corporate strategies, engagement and investment decisions of financial institutions. To prepare themselves, we suggest measuring the business consequences of ecological stress and the associated socio-economic transition and establish clear governance mechanisms to be able to exploit synergies and properly manage trade-offs between biodiversity and climate.

It is advisable that financial institutions apply an impact and dependencies approach. Only evaluating the impact of the environment on companies would not be sufficient, as it would merely reflect a dependencies or physical risk assessment of companies without considering the impact companies have on climate and nature, thus, creating gaps in the evaluation. An impact and dependencies approach however is able to comprehensively assess risks and opportunities of projects, investments or lending activities and allows to manage these appropriately.

While international and regional regulations and frameworks addressing the nexus are still emerging (as discussed in chapter 2), we have identified five key recommendations that financial institutions are advised to follow. The key recommendations don't follow a chronological order but are, in line with the order of the previous chapter recommendations, extracted from these.

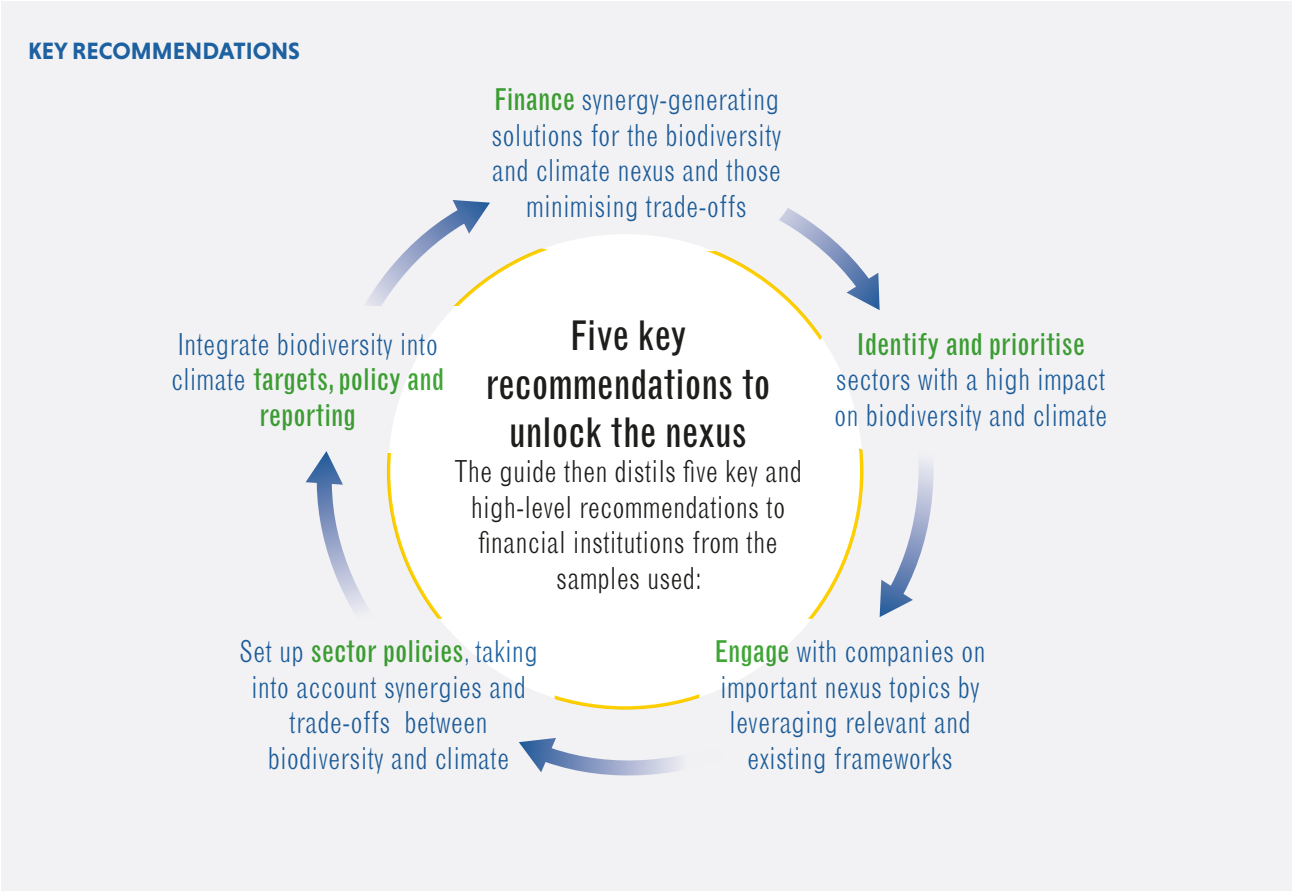


Figure 5. Five key recommendations to financial institutions on how to manage the biodiversity and climate nexus.

4.1 Finance synergy-generating solutions for the nexus and those minimising trade-offs

Financial institutions have until now been tackling land-use emissions through carbon offsetting schemes, which is a risk-based rather than an opportunity-based approach to emission reductions.

We recommend to financial institutions to finance synergy-generating solutions for the nexus and those minimising trade-offs. This includes to support financing NbS, however, financial institutions need to tackle challenges that come with these (see chapter 3.1) and biodiversity offsets (see box).

Climate finance has scaled up significantly in the last several years – reaching a yearly total invested amount of $632 billion (IMF, 2022). If biodiversity finance follows a similar pathway to climate finance, there is a large potential for the financing of nexus solutions to grow.

However, according to a 2022 UNEP report, the vast majority among asset owners (90%) were invested in just two sectors: the green building and energy sector, and only a minimal share of 2% in land-intensive sectors such as agriculture and forestry.

The reasons for the lack of financing for land-use related sectors may be the lack of a shared pathway scenario for land use; limited short-term profitability of agriculture and forestry sectors; and a lack of assets, as a large share of agriculture and most food is produced by smallholder farmers and large parts of forests are state-owned.

We suggest to financial institutions to capture existing nexus opportunities and be innovative and create new ones.

One of the most effective ways to support biodiversity is by financing high-impact sectors such as agriculture or green infrastructure. But traditional equity investments or direct lending are not able to capture all opportunities in this area. This is even more true when considering the nexus, as climate and nature disclosures do not have the same level of maturity and most incumbent companies and industries have complex organisational structures that make it difficult to determine synergies and trade-offs accurately at project level.

Private markets (both debt and equity) can support investments in R&D for agriculture. They can finance specialised telecom infrastructure required to deploy precision agriculture: (i) local Internet of Things (IoT) to control efficient irrigated agriculture (chip equipment suppliers); (ii) 5G for drones-based field surveillance (telecom operators); (iii) LEO satellite for remote areas agriculture planning; and (iv) Soil, Water and Topography (SWAT) water mapping and intactness and integrity indicator assessments (telecom operators) (see also McKinsey and Company). In order to encourage the adoption of solutions by farmers, they need to be sold as a service and demonstrate effectiveness (McKinsey and Company).

Biodiversity and carbon offsets

Biodiversity offsets are increasingly becoming an investment method for addressing biodiversity loss and providing finance for biodiversity-related solutions (Paulson Institute, 2020). Development of biodiversity certificates would help generating payments, incentivising farmers towards improved revenues (payment for ecosystem services). For instance, farmers turning to manure spread on fields increase soil carbon content, resulting in improved water regulation and reducing floods and water scarcity for cities located downstream of the water basin.

But the lack of robustness of voluntary carbon markets has raised concerns regarding biodiversity offsets. Among these are double counting risks, the lack of traceability of carbon over the long term, insufficient reliability of monitoring, reporting and verification, and the lack of regulated markets, illustrated by the current debate regarding the inclusion of land-related emissions in the EU Emissions Trading Systems (ETS) framework.

This causes financial institutions to prioritise carbon removal credits before carbon avoidance credits, which should rise to 35% by 2030 (Boston Consulting Group). According to a commitment statement by UNEP-FI, the Net-Zero Banking Alliance should restrict their reliance on carbon offsetting to carbon removals to balance residual emissions where there are limited technologically or financially viable alternatives to eliminate emissions.

We advise banks serving the agricultural sector to support farmers' transition to regenerative agriculture practices by offering discounts on interest rates for acquisition of equipment for (i) crop management, such as direct seeding & intercropping equipment and roller crimpers; (ii) circular fertilisation, such as manure spreader and small biodigesters; and (iii) mechanical weed management, including weed harrow, chisel plow and rotary hoe.

Insurance companies can invest in sustainable bonds, including assets of cities such as green infrastructure, water utilities, such as smart drainage, riverbed restoration and stormwater sewer separation infrastructure. Other opportunities include issuances regarding sustainable forest management, increasing species' varieties and reducing forest fire risks. Insurance companies would thereby reduce water and forest-related damage insurance costs while they can improve biodiversity, and align the targets of their business segments.

Infrastructure funds can invest directly in renewable energy and special purpose vehicles for biofuel infrastructure, fulfilling certain requirements to avoid significant harm to biodiversity, thereby reducing pressures on climate change and biodiversity.

Banks can also look at providing specific support and financing for start-ups that test new business models that are nexus related. UniCredit, for example, offers selected start-ups in Italy to work with them during all stages of the business life cycle. The Italian bank supported 20 start-ups on circular economy activities in 2022 alone.

Another option can be to finance solutions that tackle trade-offs like sustainable land use, circular resource management and non-invasive renewable energy – these can be considered as a risk management approach to tackle the biodiversity-climate nexus. Blended finance, where public and private finance are combined, also presents significant opportunities for financial institutions to increase profitability and limit risks of the nexus and other nature-related investments.

4.2 Identify and prioritise sectors with a high impact on biodiversity and climate

By identifying high-risk and high-impact sectors for climate and biodiversity, financial institutions can focus their efforts on the most material issues.

While climate has already been integrated into the internal assessment evaluations by financial institutions, the integration of biodiversity into these assessments is a critical next step. Without understanding the nexus risks and opportunities of each sector, strategic and portfolio analyses will be limited.

The food, beverage and tobacco sector, was ranked as the sector with the highest impact on biodiversity in a pilot study (FfB Foundation, 2023, see chapter 3.2 for specific recommendations for the agriculture sector). Second and third highest ranked the materials and energy sector (see figure 4 below).

The study used four different biodiversity footprinting tools and the ENCORE tool and aimed at identifying the top 10 most material sectors on biodiversity in order to provide preparatory information for the Nature Action 100 (NA100) investor initiative, which was recently launched.

All of the identified sectors are exposed to the nexus, as they contribute to GHG emissions through agriculture-led soil carbon emissions, the release of carbon caused by the materials end-of-life mismanagement, and the combustion of fossil fuels in the energy sector-related emissions.

Climate Action 100+ (CA100+), a climate investor initiative, has found that four key sectors are responsible for a substantial share of GHG emissions and published global sector strategies, including for the sectors electric utilities, steel, food and beverage and aviation.

Within these sectors, prioritising engagement with companies is key. The disclosure standard platform CDP used the most recently available data on emissions and market capitalisation to prioritise engagement with companies on SBTi commitments in key sectors. The SBTi also lists companies that have set science-based targets.

We recommend financial institutions to use sector-specific evaluations for company assessments and to implement further practices. Companies can be assessed and prioritised by using internal proprietary grids, analytical tools, raw data and rankings. For example, among the options for agri-food sector tools are the CDP Climate Change and Forest tools, the Coller FAIRR Protein Producer Index as well as studies and data on regenerative agriculture. The Forest 500 scores and ranking can provide examples of useful data sources when it comes to making a company selection. Data providers such as Iceberg Data Lab, MSCI and others can also provide sector-specific data on biodiversity.

As mentioned in chapter 3, the examined nexus solutions can all generate significant synergies and trade-offs.

We suggest to financial institutions to consider possible transition pathways and future scenarios in line with the GBF and the Paris Agreement, when deciding which sectors and companies they want to prioritise for their investments and engagements, depending on their strategy, asset classes and a company's generated positive impact.

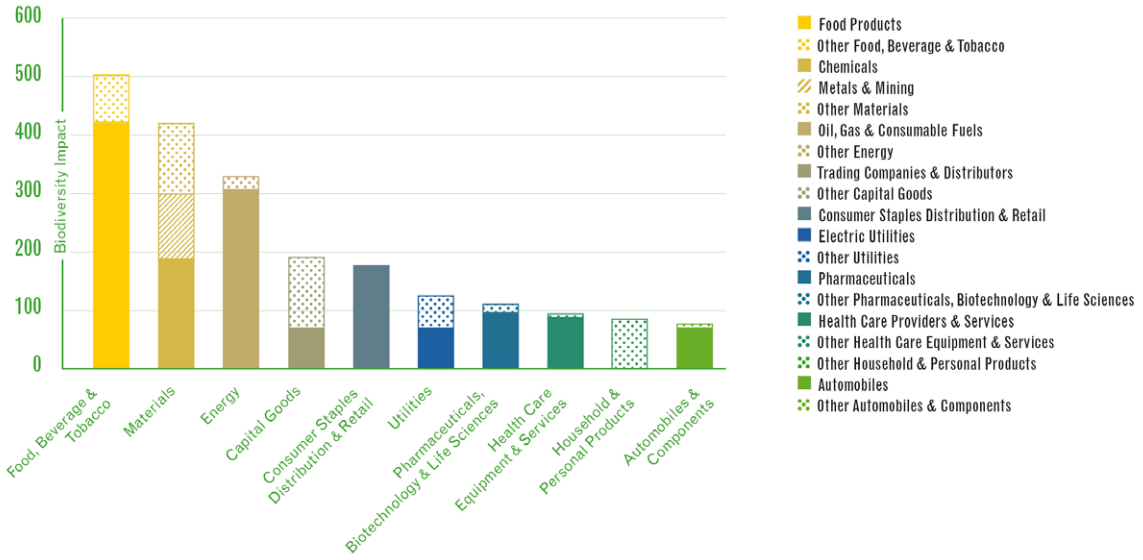


Figure 6. Biodiversity impact of the companies in a top 250 list, split out by GICS industry group and GICS industries, Finance for Biodiversity Foundation, 2023. Source: Top 10 biodiversity-impact ranking of company industries, Finance for Biodiversity Foundation, 2023.

4.3 Engage with companies on important nexus topics using relevant and existing frameworks

Engagement can play a crucial role to address synergies and trade-offs, given the fact that biodiversity solutions are currently not attracting enough financing. It is estimated that it would require an average of USD711 billion per year to halt the decline in global biodiversity between now and 2030 (Paulson Institute, 2020).

Engagement can manage trade-offs, for example those identified in chapter 3. Financial institutions are encouraged to ensure sustainable agricultural practices (chapter 3.2), require life-cycle assessments, sustainable value chain approaches, location-based materiality, socio-economic considerations and eco-labels (chapter 3.3) and engage on circular solutions as well as via collaborative initiatives on extended producer responsibility, laws to foster a circular economy or sector initiatives on R&D and innovative recycling technological solutions (chapter 3.4).

We recommend that financial institutions apply for their engagement relevant and existing frameworks.

We suggest to financial institutions to engage with companies on corporate ESG strategies addressing the nexus, specifically on setting science-based targets for both climate (SBTi) and nature (SBTN), where available. It is desirable that internal ESG advisory teams are established and advise companies on how to embed a nexus strategy into a holistic ESG and just transition strategy.

Engagement provides opportunities to create impact which may otherwise be impossible for financial institutions to achieve. For example, in the case of agriculture, over 80% of food is produced by smallholder farmers, which hinders direct engagement by financial institutions with farmers. Yet, financial institutions can still engage with companies and impact farmers through companies' supply chain programmes, purchasing and insetting policies. These interventions allow companies to achieve corporate sustainability goals, whilst building climate resilience and supply chain stability at the heart of their operations. They serve the future-proofing of companies.

Meanwhile, we suggest banks to engage with companies by leveraging the 10 Equator Principles – an environmental and social risk management framework – which allows them to identify, assess and manage related risks, including nexus issues, when they finance projects. To raise awareness of the nexus, banks can also provide training to their clients.

Collaborative engagements and public letters

Collaborative engagement allows financial institutions to address relevant topics with their portfolio companies even if they only hold minority shares.

For example, by voting for nexus-related shareholder resolutions of collaborative initiatives, financial institutions can garner high support for these issues at annual general meetings and generate a significant drive for companies to act.

CA100+ has actively worked to reduce the impact of the food sector on climate. Good practices it applies include issuing policy papers, announcing investor expectations on priority actions, clarifying issues, providing best practices and publishing progress reports. Nature Action 100 (NA100), which is the nature counterpart of CA100+, will focus on engagements of companies with the highest impact on biodiversity.

Financial institutions can also seek to weigh on a corporate's business strategy via public letters which are published online. To trigger ambitious environmental company policies, it typically requires sufficiently influential support and strong media coverage. This approach has recently been leveraged by responsible investors on plastic packaging and pollution reduction (see Dutch Association of Investors for Sustainable Development, VBDO).

FfB Foundation members support engagement on the nexus

By Arthur van Mansvelt, Co-Chair of the FfB Foundation's Engagement with Companies working group

The Engagement with Companies working group of the FfB Foundation supports financial institutions in addressing biodiversity and climate nexus issues.

For example, it published the Guide on engagement with companies in 2022, which provides guidelines for investors on how to engage with companies on themes and sectors covering biodiversity and climate synergies and trade-offs.

The guide identifies the key engagement initiatives that are currently existing, including for land use, deforestation, water and plastics. Building on the work done by the Impact Assessment working group, the engagement guide also allows financial institutions to engage with companies by using tools (see figure 5) and by analysing a company's biodiversity footprint.

In 2023, the working group will keep discussing engagement projects and best practice cases, which will also include synergies and trade-offs between climate and biodiversity.

Figure 7. 'Why, what, how matrix' with steps and building blocks to develop a comprehensive engagement approach. Source: Guide on engagement with Companise, Finance for Biodiversity Foundation, 2022.

4.4 Set up sector policies taking into account synergies and trade-offs of the nexus

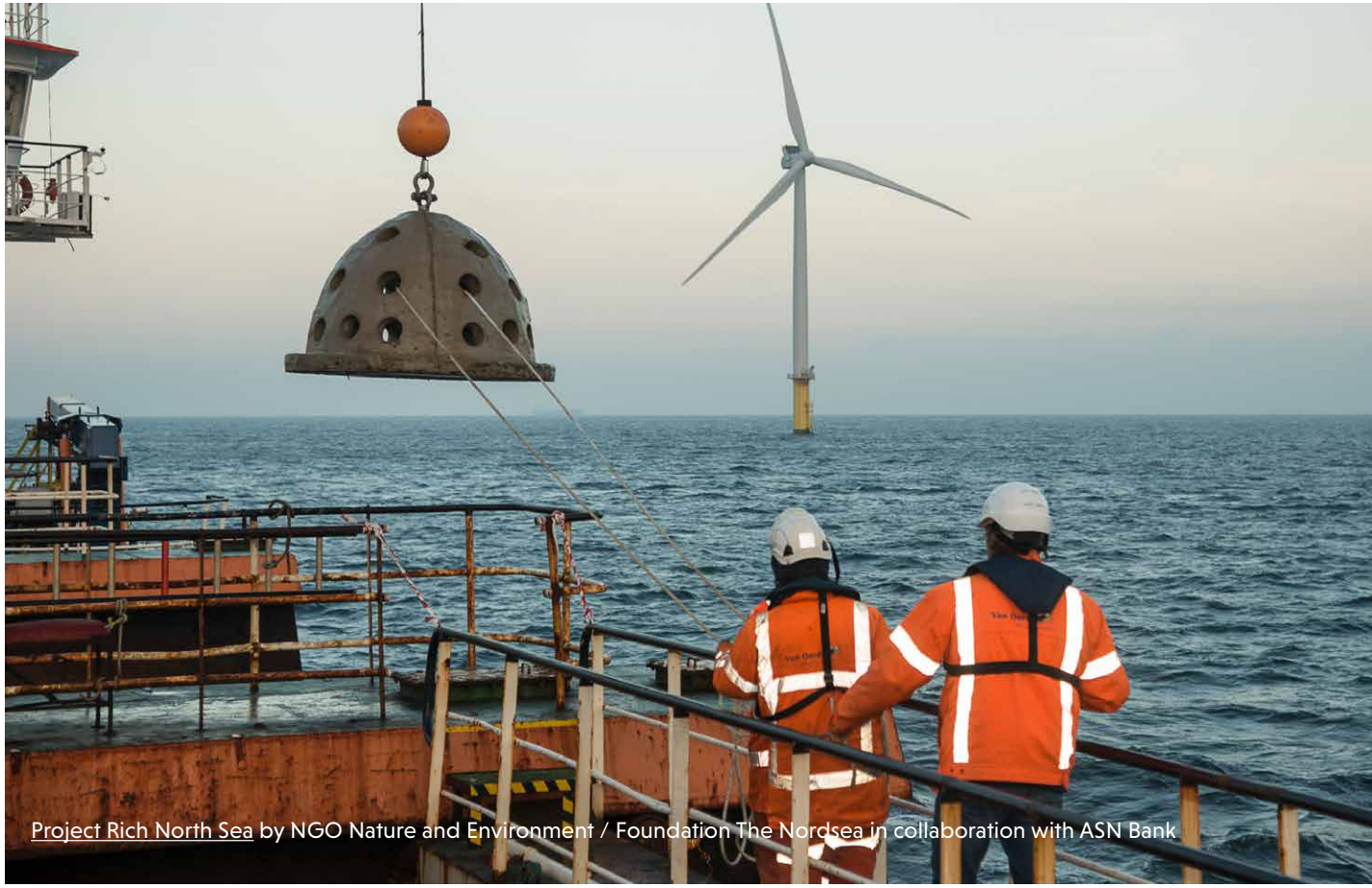
Sector policies represent a significant lever to manage trade-offs and benefit from synergies. We recommend financial institutions to set up sector-specific rules to manage their lending/investment activities and controversial sectors in line with their nexus strategy. These rules can vary for each sector, which allows financial institutions to direct the outcome of their activities and scale up their ambition over time to reach their targets.

Companies can be motivated to change their practices, by excluding them from investee portfolios or from lending as long as they don't establish adequate nexus policies.

Exclusions can curtail deforestation, illegal wildlife trade, deforestation-linked commodities, single-use plastics or polluting practices. Sector policies can require certifications and third-party verification systems, such as Fairtrade and RSPO.

We advise that the lending/investment activities of financial institutions do not significantly harm (DNSH) other dimensions of sustainability, including climate. In this regard, a few climate solutions can be considered to have trade-offs with biodiversity, such as dams without dedicated facilities for migratory species; quick carbon removal such as substituting fossil-fuel materials with plantation wood; energy storage solutions failing to use circular metals; onshore wind farms and large solar farms built on biodiversity-rich areas or productive agricultural land (see also IPBES and IPCC, 2021).

There is a lack of scientific knowledge regarding ocean biodiversity and climate regulation processes of the ocean, such as plume circulation and zooplanktons as carbon sinks. But financial institutions can address this issue through a Do No Significant Harm (DNSH) approach, by financing activities that may reduce key pressures, such as alternatives to fishing, climate change mitigation options and a reduction of single-use plastics production.



Project Rich North Sea by NGO Nature and Environment / Foundation The Nordsea in collaboration with ASN Bank

4.5 Integrate biodiversity into climate targets, policy and reporting

Integrated biodiversity and climate targets can provide the top-down tool to address the dual crisis of climate and nature. Climate net-zero targets have become common among financial institutions thanks to collaborative climate initiatives and alliances such as the Glasgow Financial Alliance for Net Zero (GFANZ), the Net Zero Asset Managers initiative (NZAM), the Net-Zero Banking Alliance (NZBA), the Net-Zero Insurance Alliance (NZIA) and the Net Zero Asset Owner Alliance (NZAO).

A KPI directory and targets for biodiversity and climate for financial institutions are not existing as of today (see chapter 4.5).

Even though biodiversity targets for financial institutions are still under development, there are already some guidelines existing, such as the 2021 Guidance on Biodiversity Target-setting by UNEP FI and UNEP-WCMC. Many of the covenants of these frameworks can also have a positive contribution to climate targets.

For financial institutions, the following targets in the post-2020 GBF are potentially most relevant:

- Target #8: Minimise the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions, including through Nature-based Solution and/or ecosystem-based approaches, while minimising negative and fostering positive impacts of climate action on biodiversity;

Combining solar panels and plants on roofs will increase both the renewable energy production and biodiversity plus the plants also help cooling the building and city. Source: International Towers

- Target #15: Take legal, administrative or policy measures to encourage and enable businesses and financial institutions to regularly monitor, assess and transparently disclose their risks, dependencies and impacts on biodiversity along their operations, supply and value chains, and portfolios; and
- Target #19: Substantially and progressively increase the level of financial flows to biodiversity towards the target of $200 billion per year.

Additionally, as discussed in chapter 2, targets 7 and 8 also create synergies for addressing the nexus. Financial institutions can use the GBF as a starting point to explore setting targets based on it.

On the policy side, we advise financial institutions to create a nexus strategy and extend their climate policy to the nexus, by committing to the Do No Significant Harm (DNSH) principles and by adding measures to address the synergies and trade-offs of nexus issues, as mentioned in chapter 3.

In regard to reporting, the Taskforce on Nature-related Financial Disclosures (TNFD) guidelines are inspired by and aligned with the Taskforce on Climate-related Financial Disclosures (TCFD) pillars on governance, risk (and impact) assessment, strategy and metrics and targets. We suggest to financial institutions to integrate biodiversity-related disclosures into the TCFD reporting, adding information as required, to ensure that neither climate nor nature risks and opportunities are overlooked.

FfB Foundation members work on target setting for the nexus

By Charlotte Apps, Co-Chair of FfB Foundation's Target Setting working group

To set meaningful and effective targets on nature, we advise financial institutions to understand both the synergies and potential trade-offs between addressing nature and climate change. As such, the climate-nature nexus is a key concept that the FfB Foundation's Target Setting working group is using to inform its work on target setting:

1. **Nature targets and net-zero targets must be complementary:** Targets on nature must be aligned to and help to accelerate the trajectory to net zero. In addition, as nature-based pathways are developed, existing net-zero targets may have to be adapted to avoid unintended negative outcomes for nature, recognising that there are both synergies as well as potential trade-offs when addressing climate and nature. The Target Setting working group is closely following the work of the SBTN, as they develop nature-based pathways and associated target-setting guidance for companies and will use this information to inform its target-setting guidance for financial institutions, ensuring its work is aligned to the latest science.

2. **Building on net-zero frameworks:** As financial institutions look to develop targets on nature, they are advised to leverage the knowledge and expertise that the industry continues to build on climate and adapt these principles and frameworks for the use case of nature. As such, the target-setting framework that the working group is developing for nature is built around the same principles and structure as leading net-zero frameworks: portfolio-level targets, asset-level targets and engagement targets.

3. **Establishing a baseline level of knowledge:** As with climate, we recommend financial institutions to upskill their workforce to be able to effectively set and deliver on targets for nature. As such, while nature-based pathways and scientific guidance is being prepared, we suggest to financial institutions to set process targets. These allow organisations to prepare themselves for the time when science-based portfolio targets can be set. A key element of setting such targets is clearly communicating the close link between nature and climate, and the critical role that nature must play in achieving net zero.

5. Conclusion

Without transformative action in line with the goals of the Paris Agreement, average global temperature rise of around 4 degrees Celsius can be expected to result in an estimated $23 trillion of associated global economic losses over the next 80 years (CA 100+). This would harm all economies, asset classes and industries, whether directly or indirectly, with increasingly damaging consequences for all financial market actors.

But while both climate and biodiversity actions are essential, they cannot be treated separately. Nature and climate are intrinsically correlated – we cannot solve one without considering the other. In the 30 years since the Rio Conventions were initiated to enable international cooperation on climate, biodiversity and land issues, the biodiversity and climate crises have worsened.

Global biodiversity and climate change mitigation plans up to 2030 lack detail and suitable levels of ambition. Critical funding gaps of about $536 billion per year risk destabilising biodiversity and climate efforts (Environment and Society Programme, 2022). Meanwhile, temperature rise and biodiversity loss continue, increasing the possibility of irreversible climate impacts and ecosystem destabilisation. In the decade ahead, we need to foster a major turning point by tackling both critical issues in an integrated way to avoid the worst impacts.

As this guide has discussed, there are numerous synergies and trade-offs to consider. To protect and restore nature, businesses and financial actors need to identify, assess, mitigate and disclose on nexus-related topics. This approach can lead to a win-win outcome for nature, climate, people and the economy. The most common trade-offs of nexus themes such as Nature-based Solutions, alternative energy, regenerative agriculture and circular economy solutions can already be avoided by changing the way how these projects are undertaken. By using renewable energy to power solutions, taking a results-based approach and considering the impact of activities on both climate and nature at every step, financial institutions can help mitigate trade-offs and exploit synergies.

Addressing nature and climate solutions in an integrated way can be seen as a fundamental risk management approach. Supporting economic development without considering climate change and biodiversity loss, makes financial institutions highly vulnerable to both. They are destined to face physical risks by financing companies that will be affected by declining ecosystem services and climate change. Ignoring the nexus will also lead to rapidly increasing transition risks.

Nevertheless, financial institutions have multiple tools at their disposal to address the nexus, exploit synergies and mitigate trade-offs, including holistic impact assessments, prioritising sectors, carrying out engagements, investing in specific solutions, establishing sector policies and exclusion lists, and setting up nexus-related targets. At every step, financial institutions need creativity, innovation and collaboration to address the nexus. We hope this paper provides a foundation to start this process.

6. Sources

Executive Summary

Guide on engagement with companies. Finance for Biodiversity Foundation, Finance@Biodiversity Community, 2022.

Chapter 1

The Economic Case for Nature. International Bank for Reconstruction and Development /World Bank, 2021

The Climate-Nature Nexus. Implications for the financial sector. Finance for Biodiversity Initiative, 2021

Act now! The why and how of biodiversity integration by financial institutions. Finance for Biodiversity Foundation, 2022.

Chapter 2

Climate Change 2022: Impacts, Adaptation and Vulnerability. Summary for policymakers. IPCC, 2022

Climate Change 2021: The Physical Science Basis. Chapter 11: Weather and Climate Extreme Events in a Changing Climate. IPCC, 2021

Australia's 2019-2020 bushfires: The wildlife toll. WWF, 2020

The Bramble Cay melomys Melomys rubicola (Rodentia: Muridae): A first mammalian extinction caused by human-induced climate change? Wildlife Research, Waller et al, 2017.

Global warming of 1.5°C. Chapter 3: Impacts of 1.5°C of Global Warming on Natural and Human Systems. Global Warming of 1.5°C. IPCC, 2018

Future effects of climate and land-use change on terrestrial vertebrate community diversity under different scenarios. Proceedings of the Royal Society B, Tim Newbold, 2018

Amazonia as a carbon source linked to deforestation and climate change. Nature, Gatti et al, 2021

Spreading like Wildfire: The Rising Threat of Extraordinary Landscape Fires. UNEP, GRID-Arendal, 2022

Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Chapter 7: Agriculture, Forestry and Other Land Uses (AFOLU). IPCC, 2022

Defaunation affects carbon storage in tropical forests. Science Advances, Bello et al, 2015

IPBES-IPCC Co-Sponsored Workshop Report on Biodiversity and Climate Change. IPBES and IPCC, 2021

Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Chapter 4: Strengthening and Implementing the Global Response. IPCC, 2018

Chapter 3

State of Finance for Nature. UNEP, 2021

Aligning regenerative agricultural practices with outcomes to deliver for people, nature and climate. The Food and Land Use Coalition, 2023

Temperature increase reduces global yields of major crops in four independent estimates. Proceedings of the National Academy of Sciences of the United States of America (PNAS), Zhao et al, 2017

Climate Change, biodiversity and nutrition nexus. Evidence and emerging policy and programming opportunities. The Food and Agriculture Organisation of the UN (FAO), 2021

Soil and the intensification of agriculture for global food security. Environment International, Kopittke et al, 2019

Food wastage footprint. Impacts on natural resources. The Food and Agriculture Organisation of the UN (FAO), 2013

Cultivating farmer prosperity: Investing in regenerative agriculture. Boston Consulting Group, One Planet Business for Biodiversity (OP2B), WBCSD, 2023

Electricity Market Report 2023. International Energy Agency (IEA), 2023

Mitigating biodiversity impacts associated with solar and wind energy development. International Union for Conservation of Nature and Natural Resources (IUCN), 2021

Controlling biodiversity impacts of future global hydropower reservoirs by strategic site selection. Scientific Reports, Dorber et al, 2020

Renewables 2021. International Energy Agency (IEA), 2021

Oil palm and biodiversity. IUCN, 2018

Biodiversity Impacts of Increased Ethanol Production in Brazil. Land, Duden et al, 2020

Palmed Off. Rainforest Foundation UK, 2019

A nuclear future for biodiversity conservation? Biological Conservation, Mateo-Tomas et al, 2022

Consequences of nuclear accidents for biodiversity and ecosystem services. Conservation Letters, Von Wehrden et al, 2011

Circular Economy, Banks, and Other Financial Institutions: What's in it for them? Circular Economy and Sustainability. Ozili, 2021

Completing the Picture: How the Circular Economy Tackles Climate Change. Ellen MacArthur Foundation, 2021

Risk and sustainability: trade-offs and synergies for robust decision making. Environmental Sciences Europe. Hauschild et al, 2022

Bioplastics for a circular economy. Nature Reviews Materials, Rosenboom et al, 2022

Chapter 4

Financing Nature: Closing the global biodiversity financing gap. Paulson Institute, The Nature Conservancy, Cornell Atkinson Centre for Sustainability, 2020

Mobilizing Private Climate Financing in Emerging Market and Developing Economies. International Monetary Fund (IMF), 2022

The Second Progress Report of the Net-Zero Asset Owner Alliance: Advancing Delivery on Decarbonisation Targets. UNEP, 2022

Top 10 biodiversity-impact ranking of company industries. Finance for Biodiversity Foundation, 2023

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

Global sector strategies: Recommended investor expectations for food and beverage. Climate Action 100+, Ceres, PRI, 2021

Aligning food systems with climate and biodiversity targets. Environment and Society Programme, Harwatt et al, 2022

Colophon

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Invitation to join

This guide is one of the many steps in our journey towards fully integrating biodiversity as financial institutions. We encourage financial institutions from all continents to start integrating biodiversity into their activities and decision-making in order to accelerate the transition towards nature-positive businesses. The Finance for Biodiversity Foundation working groups with leading banks, investors and insurers will continue to collaborate on joint actions. Financial institutions are welcome to join as a member.

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