

Paving the way towards a harmonised biodiversity accounting approach for the financial sector

Partnership for Biodiversity Accounting Financials (PBAF)

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The Partnership for Biodiversity Accounting Financials, or PBAF, was initiated by ASN Bank with the aim to improve biodiversity accounting in the financial sector and to work towards a harmonised biodiversity accounting approach.

Through this report, the Dutch participants share their findings with other interested parties to encourage others to adopt biodiversity accounting as a positive step towards a biodiversity friendly economy.

Today, PBAF Netherlands consists of the following partners:



We invite financial institutions to join the PBAF initiative. More information about PBAF can be found on the website: www.pbafglobal.com

Current Chair ASN Bank, Roel Nozeman, Senior Advisor Biodiversity
Email: roel.nozeman@asnbank.nl

Main authors at CREM and PRé Sustainability: Wijnand Broer, Daniël Kan and Mark Goedkoop
Graphic design: Katja Visser, www.katjavisser.nl

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Message from Arie Koornneef, CEO of ASN Bank, the Netherlands

ASN Bank, a division of de Volksbank, was founded in 1960. Ever since its inception, the bank has been deeply committed to nature protection and social justice. At ASN Bank, we focus on our customers while making a positive impact in three important areas: climate, human rights and biodiversity.

In 2014, we embarked on a journey to explore how we could contribute to, and learn about the impact of our investments on, biodiversity. At the time, there was no appropriate methodology or data available. So we decided to start a pilot with consultants CREM and PRÉ Sustainability to find out whether we could develop our own.

This first pilot led to a deeper understanding and garnered more internal support for our efforts. It resulted in an ambitious goal: *to have all our investments create an overall net positive effect on biodiversity by 2030.*

It also taught us a very valuable lesson, which I'm happy to share: sometimes you just have to get started before you have all the answers and learn as you go.

It's wonderful to see the growing awareness on the part of regulators and financial institutions of the importance of biodiversity. Now is a crucial time for the financial sector to take bold new steps and start measuring, reporting and acting on the negative and positive impacts the sector has on biodiversity.

Our reason for wanting to preserve biodiversity is obvious. Nature is what keeps us and our economy alive. The conclusions of the 2019 report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) are shocking. We humans are destroying the earth's natural ecosystems at an unprecedented pace. We need to protect nature and manage it responsibly, giving the generations that come after us the chance to enjoy the same benefits from nature as we enjoy today.



Financial institutions have a vital role to play in protecting, restoring and making responsible use of our natural resources. We have initiated the Partnership for Biodiversity Accounting Financials (PBAF) to drive the much-needed change in the financial sector. Our ambition is to engage with pioneering global financial institutions and team up with them to develop a set of harmonised principles for biodiversity impact assessment and disclosure.

We're delighted and proud to present PBAF's first report. We hope that you enjoy reading it and will join us on this crucial journey.

Message from Humberto Delgado Rosa, Director for Natural Capital in DG Environment of the European Commission

At present business accounts are focused on the financial positions and performance and exclude our relationship with the natural environment. These partial data sets do not enable executives, Boards of Directors and investors to understand the contribution that natural capital, ecosystems and biodiversity make to a business, including related risks and opportunities inherent in business models and strategy. The World Economic Forum points increasingly to the hidden risks nature loss poses for businesses. Crossing the ecological limits of our planet directly affects businesses that depend on and have an impact on nature. Insufficient accounting for these impacts and risks could have unintended consequences: just one example, between \$235 billion and \$577 billion of global crop output is at risk annually from pollinator loss. This can lead to ill informed decisions with potential long term impacts for the business and society, as well as the natural world we all depend upon, let alone blind spots on a key area of risk for investments.

As a key pillar of the European Green Deal, the European Commission has adopted the EU Biodiversity Strategy for 2030 as a comprehensive, ambitious and long-term plan for protecting nature and reversing the degradation of ecosystems. It states clearly that biodiversity considerations need to be better integrated into public and business decision-making at all levels. Complementing the management accounting systems through measuring and integrating the value of nature and developing a holistic approach that includes biodiversity impact is a key enabler to achieve this.

In line with the European Green Deal, the Commission is now considering actions to deliver the strategy for green financing, including the improvement of the reporting and comparability of sustainability performance data and the underlying environmental and social accounting practices.

It is against this background that I commend the valuable contribution by the Partnership for Biodiversity Accounting Financials (PBAF) set out in this report on a harmonised biodiversity accounting approach for the financial sector. With this common ground paper this group of frontrunners is paving the way to address the following key challenges:



1) suggesting ways to blend (potential) impacts on biodiversity and ultimately the value of nature into "traditional" management and investment information processes;

2) contributing to the need for better comparability of natural capital and biodiversity information produced by different companies;

3) ensuring that biodiversity is the central pillar of this from the outset.

I hope this publication will receive a wide recognition and application, and that it will trigger inspiration for the financial sector and beyond.

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Peter Blom, CEO Triodos Bank

The loss of biodiversity is one of the greatest challenges for the existence of life on earth. The damage to biodiversity caused by our way of living, specifically agriculture, is considerable. We are at the point that we should not talk about reducing harm to biodiversity, but about regeneration. That is exactly what Triodos Bank aims to do with its loans and investments. In order to measure and report on the financial sector's impact on biodiversity, a common methodology is needed. That is why the work of the Partnership Biodiversity Accounting Financials is so important. The collaboration between several financial institutions to find common ground will help formulate business strategies that have a positive impact on biodiversity.'



Steven Evers, Managing Director, Triple Jump

Investors are only just beginning to factor in biodiversity in their allocation decision, and this at a time when over half the world's GDP is at risk because of nature loss. We believe that transitioning to an economy that preserves nature presents an opportunity for financial institutions to play a crucial role in restoring biodiversity. The PBAF report offers guidelines to measure and assess the impact of investments on biodiversity. Building on the pioneering work of ASN Bank, Triple Jump is proud to contribute its expertise in impact investing and measurement to this partnership and looks forward to furthering this dialogue.



Carola van Lamoen, Head of Sustainability Investing Center of Expertise Robeco

Robeco recognizes the financial risks of biodiversity loss and actively engages to mitigate the negative impact of deforestation in the global supply chains where our investments have exposure to. On top of that we are committed to find ways to measure the biodiversity footprint of our portfolio and aim to provide transparency on this topic to our clients and to society. The work of the Partnership Biodiversity Accounting Financials that is collected in this Common Ground report is crucial for us to make the next step on this journey.



Dennis van der Putten, Director of Sustainability & Corporate Strategy, ACTIAM

The preservation of the world's Biodiversity is essential to ensure thriving businesses and societies, on which resilient economies strongly depend. As investors, it is our fiduciary duty to support the transition to a sustainable society and halt the depletion of natural resources. Action by the financial sector on the Biodiversity topic is therefore a must, and measuring the impact of investments on the quality and availability of biodiversity resources is an important step in this path. The need for standardized measurement methods is clear. In line with ACTIAM's commitment to zero net-loss biodiversity across our portfolios by 2030, we support PBAF and its pursuit for improved methods to assess and report the impact of financials on natural resources.



Jorim Schraven, Director of Impact and ESG, FMO

The transition towards a sustainable financial system can be accelerated by combining forces. Harmonized accounting for impact is essential in this as it gives financial institutions the understanding of the risks they take, and the ability to align with global goals. We have managed to do this on a global scale with carbon accounting, now let us take the next step and make Partnership Biodiversity Accounting Financials the foundation for Biodiversity impact accounting for financial institutions all over the world."

Stakeholders



Frank Elderson, Executive Board Member Nederlandsche Bank N.V.

It is now widely accepted that climate-related risks are a source of financial risks. However, so far too few are aware of financial risks arising from biodiversity loss. The work of the Partnership Biodiversity Accounting Financials (PBAF) is therefore essential as it enables financial institutions to track their impact on biodiversity. This is an important step towards understanding, measuring and managing biodiversity-related financial risks by financial institutions.



Caroline van Leenders, Senior policy maker Dutch Ministry of Agriculture, Nature and Food Quality, Directory Nature.

Halting the loss of biodiversity is a policy objective of the Ministry of Agriculture, Nature and Food Quality (LNV). In addition to more traditional policy instruments aimed at the conservation of nature, LNV is also interested in the leverage that the financial sector can have when it comes to reducing the negative impact on biodiversity and investing in projects with a positive contribution to nature. An important policy goal is the increase in transparency about the relationship with nature in the financial sector. That is why the Ministry has been supporting the Partnership for Biodiversity Accounting Financials for several years by co-financing research into methodology development and the dissemination of knowledge and insights on international fora. We are proud to work alongside Dutch financial institutions and their worldwide leading position with regard to biodiversity.



Jacqueline Duiker, Senior Manager Sustainability & Responsible Investment, Association of Investors for Sustainable Development (VBDO)

The materiality is crystal clear. Without protecting our planet's biodiversity, we will no longer have a liveable society, let alone a functioning economy. It is vital that the financial sector employs criteria on negative and positive biodiversity impact associated with its loans and investments. PBAF is a fantastic example of emerging initiatives within and beyond the financial sector to put a stop to the ongoing loss of biodiversity by setting a standard on how to assess and disclose real world and portfolio impact on biodiversity.



Romie Goedicke, Senior Expert Green Economy, IUCN-NL

Nature is the basis of all life. With over 1 million estimated species at risk of extinction in the near future, concerted action by all relevant stakeholders is needed now before it is too late. We believe the financial sector is a key lever for change, and an important avenue to put international biodiversity agreements and treaties into action. But how do you measure impact on nature effectively? In order to achieve the biodiversity goals and targets, biodiversity impact measurement is vital to improve transparency and accountability and drive change. Biodiversity footprinting is an effective approach to measure and mitigate business pressures and impacts on biodiversity. We are very pleased to see that the Partnership Biodiversity Accounting Financials (PBAF) is stepping up to the challenge of working towards a common ground on biodiversity footprinting in the financial sector and we are looking forward to further cooperation with the partnership in this process.



Dirk Schoenmaker, Professor of Banking & Finance, Rotterdam School of Management, Erasmus University and Academic Director of the Erasmus Platform for Sustainable Value Creation

It is high time that the financial sector looks beyond climate change. Biodiversity is multifaceted and interrelated with climate change and water use. That makes it a fascinating area, but also difficult to measure and manage. PBAF is a great advance in harmonising accounting for biodiversity. Importantly, it does not only take a risk perspective (avoiding negative impact) but also an opportunity perspective (creating positive impact). Moreover, it covers several asset classes. Using PBAF proactively, the financial sector can become part of the solution to restore biodiversity.



Martin Lok, Deputy Director Capitals Coalition

To tackle climate change and reverse the loss of nature we must reshape the way we make decisions to include the value created by nature, people and society. But we can only do this in a credible way if we standardize how we account for this value. The role of the financial sector in meeting this challenge is key. Building on the Natural Capital Protocol and its companion Finance Sector Supplement, this report presents an important next step by demonstrating how metrics used to include the value of nature in financial decision-making can be harmonized in a practical and comparable way. The fact that the project was run by financial institutions themselves testifies to the increased attention this issue is receiving from traditional economic actors and to the importance of collaboration in moving the needle and achieving our shared ambitions.



Dr. Rudolf de Groot, Chair Ecosystem Services Partnership, Associate Professor in Integrated Ecosystem Assessment & Management with the Environmental Systems Analysis Group of Wageningen University, the Netherlands

The protection of biodiversity and sustainable use of ecosystems can only be achieved if the full value of nature is accounted for in every day decision making. Therefore, fundamental changes are needed in the current economic system. Financial institutions need to understand not only the intrinsic value but also the economic importance of animals, plants and healthy ecosystems, in their own environment and in those in which they invest. To do this it is essential to assess the economic value of the affected ecosystem services. The development of accepted valuation methodologies is the next step to better informed decision making by investors. Therefore we are enthusiastic supporters of

the PBAF initiative. Developing a systemic financial assessment which takes these ecosystem services into account has the promise to be the gamechanger we are all searching for. We are very pleased to see how PBAF is setting a tone for a more complete and balanced view on financial investments and the impact they have on the future of our planet.



Corli Pretorius, Deputy Director, UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC)

There are increasing drivers for businesses to measure and report on impacts and dependencies on biodiversity with a growing awareness of the material risks that biodiversity loss presents to business performance. As approaches to measure biodiversity develop, it becomes vital to exchange best practice approaches through initiatives like the Partnership for Biodiversity Accounting Financials, to learn lessons within and across industries, and address gaps to enable action to sustainably manage biodiversity at scale. The alignment of these measurement approaches will allow common language and consistency in decision-making and foster greater uptake by businesses and financial institutions. We look forward to continuing our collaboration with the Partnership as part of the Aligning Biodiversity Measures for Business collaboration to this aim.

1 Introduction

1.1 Purpose and Scope

The Partnership for Biodiversity Accounting Financials (PBAF) is a partnership of financial institutions that work together to explore the opportunities and challenges surrounding the assessment and disclosure of the impact on biodiversity associated with their loans and investments. Through discussions, the exchange of experiences and case studies, the PBAF partners cooperate in the development of a set of harmonized principles underlying biodiversity impact assessment. Such principles are not reserved to one specific impact assessment methodology and may offer a valuable starting point for both qualitative and quantitative biodiversity impact assessments or biodiversity 'footprints'. By means of these principles, PBAF wants to contribute to the development of a harmonised biodiversity accounting approach in the financial sector.

The financial institutions participating in PBAF have different reasons for joining the initiative, for example:

- To develop a biodiversity metric in order to expand a focus on deforestation to biodiversity as a whole.
- To share experiences with other financial institutions in order to facilitate and enhance the uptake of the topic, creating more (positive) impact.
- To understand how a negative impact on biodiversity of listed equity can be assessed and addressed/mitigated.
- To develop a holistic approach for biodiversity impact, including definitions and a standardised way to report to investors.
- To inform the sustainable impact-funds invested in, thereby enhancing these funds.
- To use impact assess results for engagement purposes: where to push companies?
- To expand a focus on negative impacts on biodiversity to positive impacts, including definitions and impact assessment principles. Enabling a shift from do no harm to do good.

In this first paper, PBAF focuses on definitions and the assessment of negative impacts, avoided negative impacts and positive impacts.

1.2 About the initiators and supporters of this common ground paper

About ASN Bank

ASN Bank is a Dutch retail bank. From the time it was founded in 1960, ASN Bank has been deeply committed to nature protection and social justice. The bank has €15 billion worth of assets under management. Dominant asset classes are mortgages, government bonds, sustainable project financing, green bonds and investment funds (listed companies). ASN Bank is a division of Dutch-based de Volksbank Group, whose total assets amount to €62 billion.

ASN Bank has adopted the following mission: 'Our economic conduct is aimed at promoting sustainability in society. We help to secure changes that are intended to put an end to processes whose harmful effects are shifted to future generations or foisted onto the environment, nature and vulnerable communities. In doing so, we do not lose sight of the necessity to yield returns in the long run that safeguard the continued existence of our bank. We manage the funds that our customers entrust to us in a manner that does justice to their expectations'

We have translated our mission into policy. Our three sustainability pillars, i.e. climate, biodiversity and human rights, are at the heart of this policy.

ASN Bank has set itself three long-term goals in line with its sustainability pillars:

- Climate: all of ASN Bank's investments and loans will be net climate-positive by 2030.
- Biodiversity: all of ASN Bank's investments and loans will have an overall net positive effect on biodiversity by 2030.
- Human rights: By 2030 the garment sector will have implemented all necessary processes to enable a living wage for workers in its supply chain.

For more information about ASN Bank and sustainability, please visit our [website](#).

About ACTIAM

ACTIAM is a globally operating asset manager with a strong legacy in responsible and impact investing. We manage around €60bn (June 2020) primarily for insurance companies, pension funds, banks and intermediaries, offering a comprehensive range of investment funds and solutions, both actively and passively managed.

We impose strict criteria on investments and follow a robust selection process. Our capabilities are focused towards generating higher financial returns hand in hands with social and environmental returns. In our strategies we focus on three material themes: climate, water and land, for which we have defined targets that we measure in footprints, such as:

1. Climate: 30% reduction of greenhouse gas emissions in our portfolios by 2030 (compared to 2010).
2. Water: a water-neutral portfolio by 2030.
3. Land: zero net deforestation across its portfolios by 2030.

Through these themes, we capture the biodiversity risks and/or opportunities in our portfolios. We believe that companies adopting sustainable business practices are better prepared for the future. This is why we aim to invest actively in companies that help to create a sustainable future and that contribute to the accomplishment of the Sustainable Development Goals. Together with our partners, we strive to continually generate positive impact.

About FMO

FMO is the Dutch entrepreneurial development bank. We invest in over 85 countries, supporting jobs and income generation in order to improve people's lives in the parts of the world where we can make the biggest difference. Our role extends beyond financing, as we help businesses to operate and grow transparently in an environmentally and socially responsible manner. With our clients serving millions of customers, their adoption of good practices will have a broad positive impact on local development. They create jobs, provide people with an income, generate taxes and contribute to a healthy private sector. This makes it possible to build a local economy that offers opportunities for people today without compromising the opportunities of future generations.

Through our approach, we aim to demonstrate to other investors that strong financial returns and positive impact in developing countries and emerging markets can go hand-in-hand. Our success in higher-risk markets provides them with the confidence to get on board, allowing us to mobilize more funding for our clients.

Working with partners ranging from our partner European Development Finance Institutions (EDFIs) to civil society organizations and investors, we serve the many entrepreneurs all over the world who have set up and built their companies to contribute to positive change.

Through our financing and investments, we enhance our and others' impact and can contribute to a sustainable society on a liveable planet. We support the 17 United Nations Sustainable Development Goals (SDGs) and aim to contribute to their achievement through our mission and activities.

About Robeco

Robeco is an international asset manager offering an extensive range of active investments, from equities to bonds. Research lies at the heart of everything we do, with a 'pioneering but cautious' approach that has been in our DNA since our foundation in Rotterdam in 1929. We believe strongly in sustainability investing, quantitative techniques and constant innovation. We know that sustainability is a long-term force for change and a driver to integrate ESG across our investment solutions, actively engage with companies, and work on real impact. By diving deeper to understand dynamics and impact, our comprehensive sustainable approach leads to better-informed investment decisions. Creating better returns – and looking after the world we live in.

About Triple Jump

Triple Jump is an impact-focused investment manager founded in 2006 that provides meaningful and responsible investment opportunities in developing countries. We believe that opportunities are not spread equally around the world, but talented people are. By providing financing and support to entrepreneurs in developing countries, we aim to empower individuals to improve their quality of life and unlock the potential to overcome global challenges such as poverty, inequality and climate change.

Headquartered in Amsterdam and with asset under management of EUR 910M, Triple Jump focuses on investment and advisory solutions around four impact themes: Financial Inclusion, Affordable Housing, Small and Medium Enterprise (SME) Finance, and Climate & Nature.

About Triodos Bank

Founded in 1980, Triodos Bank has become one of the world's leading sustainable banks. Triodos Bank wants to promote human dignity, environmental conservation and a focus on people's quality of life in general. Key to this is a genuinely responsible approach to business, transparency and using money more consciously. Triodos Bank puts values-based banking into practice. It wants to connect depositors and investors with socially responsible businesses to build a movement for a sustainable, socially inclusive society, built on the conscious use of money.

Its mission is to make money work for positive social, environmental and cultural change. By lending to, and investing in, sustainable enterprises Triodos Bank helps create a better, more sustainable world. At the same time, the bank aims to change finance by influencing the banking sector to become more transparent, diverse and sustainable.

Triodos Bank has banking activities in the Netherlands, Belgium, the UK, Spain and Germany as well as Investment Management activities based in the Netherlands but active globally.

1.3 About this common ground paper

1.3.1 Context

In 2014, ASN Bank decided to develop a long term objective on biodiversity. The stakeholder engagement process following this decision showed that, to decide on such an objective, the bank needed to understand how its investments were impacting on biodiversity. In the following years, this resulted in the development of a footprinting methodology (the biodiversity footprint financial institutions, BFFI) and footprint calculations of the bank's investment portfolio. The results showed both the value and the challenges of biodiversity footprinting on the level of an investment portfolio and the need to discuss the approach with experts and other financial institutions interested in this topic. In 2018, a cooperation between ACTIAM, ASN Bank, CDC Biodiversité and Finance in Motion, supported by CREM and PRé Sustainability, resulted in a first 'Common ground paper on biodiversity footprint methodologies for the financial sector'. Among others, this report was used as an input to the 'Aligning Biodiversity Measures for Business Initiative', coordinated by the World Conservation and Monitoring Centre of UNEP (UNEP-WCMC).

In order to continue the discussion on biodiversity footprinting in the financial sector and to create wider support, the Partnership for Biodiversity Accounting Financials (PBAF) was established by ASN Bank at the end of 2019, together with ACTIAM, Triple Jump, Triodos, Robeco and FMO. The PBAF initiative is walking in the footsteps of the Partnership Carbon Accounting Financials (PCAF), initiated by ASN Bank a few years earlier, an initiative which has now grown into a worldwide initiative.

PBAF is starting in a time of growing awareness among financial institutions that impacts and dependencies on biodiversity play an important role, both from a risk and from an opportunity perspective. Economic sectors invested in impact on biodiversity and depend on the ecosystem services nature provides. These services are increasingly at risk as a result of the loss of biodiversity. Through their investments, financial institutions can play an important role in the conservation and sustainable use of biodiversity, contributing not only to the biodiversity targets of the Convention on Biological Diversity (CBD¹), but also to the reduction of investment risks.

The important role of the private financial sector in the conservation and sustainable use of biodiversity is not only endorsed by the sector itself, but also by nature conservation organisations and governments. Interaction between these three actors is key to ensure that biodiversity related government policies, advocacy, field research and investment policies and procedures reinforce each other, creating synergies.

COMBINING FORCES; THE EXAMPLE OF THE NETHERLANDS

Cooperation between the Dutch Ministry of Agriculture, Nature and Food Quality (Ministry of LNV) and the Dutch financial sector illustrates how the transition towards a 'green' financial system can be accelerated by combining forces. Not just by creating the financial means if needed, but especially by combining knowledge and networks, building support within government and creating access to international platforms.

In 2015, the Ministry of LNV, joined by ASN Bank, organised the side event on 'Greening Finance & Financing Green' at the 13th Conference of the Parties of the CBD (COP13) in Cancun (Mexico), discussing how to bridge the gap between the green/biodiversity world and the financial world. This fruitful cooperation was continued in the years to come, including the launch of the 'common ground paper on biodiversity footprint methodologies in the financial sector' at COP14 in Egypt (joined, among many others, by ASN Bank and CDC Biodiversité) and sessions on biodiversity impact assessment at the Global Landscape Forum (Luxembourg, 2019), the annual meeting of the Ecosystem Services

The growing interest in biodiversity in the financial sector has resulted in a wide range of initiatives, including the following recent initiatives (not a comprehensive overview):

On a global level:

- Launch of the '*Finance for Biodiversity Pledge*' (see annex 1). Financial institutions that sign the pledge "ask global leaders during the 15th meeting of the Conference of the Parties (COP 15) to the Convention on Biological Diversity

Partnership (Hannover, 2019) and the European Business and Nature Summit (Madrid, 2019). Wider support within the Dutch government is created by emphasizing the key role of the finance sector in policy letters of other Dutch ministries and by making sure the topic is addressed in speeches of high government officials. The initiatives within the sector, again supported by the Ministry of LNV, provide the ammunition to do this, like the work on the Biodiversity Footprint Financial Institutions (BFFI, see below), the establishment of the Working group on Biodiversity under the Sustainable Finance Platform (see below) and the Partnership for Biodiversity Accounting Financials.

¹ Signed by 150 government leaders at the 1992 Rio Earth Summit, the Convention on Biological Diversity is dedicated to promoting sustainable development, recognizing that biological diversity is about more than plants, animals and microorganisms and their ecosystems – it is about people and our need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which to live. (<https://www.cbd.int/convention/>)

(CBD) to agree on effective measures to reverse nature loss in this decade to ensure ecosystem resilience". Moreover, signatories commit to "make every effort to take our share of responsibility and contribute to the protection and restoration of biodiversity and ecosystems via our financing activities and investments" and to "assess our financing activities and investments for significant positive and negative impact on biodiversity and identify drivers of its loss."

- The establishment of the '*Taskforce Nature-related Financial Disclosure*' (TNFD), to be launched in Q1 2021, with the aim to establish a reporting framework for finance sector impacts and dependencies on nature. Coordinated by Global Canopy, the United Nations Development Programme (UNDP), the United Nations Environment Programme Finance Initiative (UNEP FI), and the World Wide Fund for Nature (WWF).
- Development of *ENCORE*, developed by the Natural Capital Finance Alliance (NCFA) in partnership with UNEP-WCMC, a tool showing how businesses across all sectors of the economy depend on nature, and how these dependencies might represent a business risk if environmental degradation disrupts them.
- The '*Aligning Biodiversity Measures for Business Initiative*', initiated by UNEP-WCMC, aiming to form a common view amongst key stakeholders on the measurement, monitoring and disclosure of corporate biodiversity impacts and dependencies.
- The publication of '*Connecting Finance and Natural Capital: A Supplement to the Natural Capital Protocol*', a tool for financial institutions to assess how their business is impacted by, and depends upon the natural world (Natural Capital Coalition, Natural Capital Finance Alliance, UNEP FI, Global Canopy, VBDO, 2018).

On a European level:

- The *EU Taxonomy*, aiming to classify economic activities that are environmentally sustainable, covering six objectives, including the 'sustainable use and protection of water and marine resources' and 'protection and restoration of biodiversity and ecosystems'.
- The *Community of Practice Finance@Biodiversity*, focusing on integrating biodiversity into investment decisions of financial institutions.
- The '*Assessment of biodiversity accounting approaches for businesses and financial institutions*' by the EU Business @ Biodiversity Platform.
- Development of the *Product Environmental Footprint (PEF)*, a harmonised methodology for the calculation of the environmental footprint of products and organisations. Current focus on biodiversity in the PEF is limited, but a working group has started to improve this focus.

On a national level (in The Netherlands):

- Publication of '*Indebted to nature; Exploring biodiversity risks for the Dutch financial sector*', published by De Nederlandsche Bank (DNB, the Dutch Central Bank) and PBL Netherlands Environmental Assessment Agency (2020).
- The establishment of the *Working Group on Biodiversity*, chaired by NWB Bank, and part of the Sustainable Finance Platform established by DNB. In 2020, the working group published two papers: 'Biodiversity; Opportunities & Risks for the Financial Sector' and 'A Guideline On The Use Of Deforestation Risk Mitigation Solutions For Financial Institutions'.
- Development of the *Biodiversity Footprint Financial Institutions (BFFI)* by ASN Bank, PRé and CREM (2015) and calculation of the biodiversity footprint of ASN Bank's investment portfolio.

1.3.2 This common ground paper

To take up their role in the conservation and sustainable use of biodiversity, the availability of science based, reliable data on the impacts on biodiversity is an important precondition for financial institutions. PBAF partners believe that cooperation and an open discussion on biodiversity impact assessment approaches is essential for the development of a widely supported methodology that will deliver the biodiversity data required.

The common ground paper focuses on the assessment and disclosure of negative impacts, avoided negative impacts and positive impacts on biodiversity resulting from the investments of financial institutions as a way to contribute to the conservation and sustainable use of biodiversity. The aim of the paper is to define harmonized principles underlying biodiversity impact assessment approaches/methodologies. These harmonised principles can be used by financial institutions interested in assessing the impact of investments on biodiversity. Although the focus is very much on quantifying this impact, the principles are also relevant for a qualitative analysis of biodiversity impact (e.g. to understand what should be included in the analysis and how impacts can be defined). These principles could also support financial institutions with the formulation of strategies and the setting of goals.

There is no need to start from scratch. The paper builds on previous work focusing on the assessment and disclosure of the impact of financial institutions on biodiversity, including:

- 'Common ground in biodiversity footprint methodologies for the financial sector', ASN Bank, ACTIAM, CDC Biodiversité, Finance in Motion, 2018
- 'Positive Impacts in the biodiversity footprint financial institutions', CREM, PRé, 2019
- 'Biodiversity-positive investments in the Biodiversity Footprint Financial Institutions (BFFI); Description of methodology for three case studies', PRé Sustainability, 2019

Moreover, the approach presented in this paper builds on the approach with regard to carbon accounting, as presented in the publication 'Accounting GHG emissions and taking action: harmonised approach for the financial sector in the Netherlands' (PCAF The Netherlands, report 2019).

The common ground paper was developed by the PBAF partners, supported by CREM and PRé Sustainability, but not just with PBAF partners in mind. Other financial institutions and organisations involved in biodiversity impact assessment are invited to provide feedback on the paper and use the principles in their work.



2 Steps in a biodiversity impact assessment

2.1 Introduction

This chapter provides an overview of the four main steps of a biodiversity impact assessment or 'biodiversity footprint' for a loan or investment. After an introduction on the concept of a biodiversity footprint (paragraph 2.2), each step is briefly explained:

- Step 1 Analysis of the focus of the investment (paragraph 2.3)
- Step 2 Analysis of the pressures induced by the economic activity (paragraph 2.4)
- Step 3 Analysis of the impact on biodiversity (paragraph 2.5)
- Step 4 Interpretation of the footprint result (paragraph 2.6)

Most of the biodiversity footprinting methodologies developed so far, like the Biodiversity Footprint Financial Institutions (BFFI) and the Global Biodiversity Score (GBS), include these or similar steps (see figure 1 for the steps in the BFFI).

Steps in a biodiversity impact assessment: the BFFI

The figure below shows the steps in the Biodiversity Footprint Financial Institutions (BFFI) from understanding the investment to the interpretation of the results and the type of data used in each step.

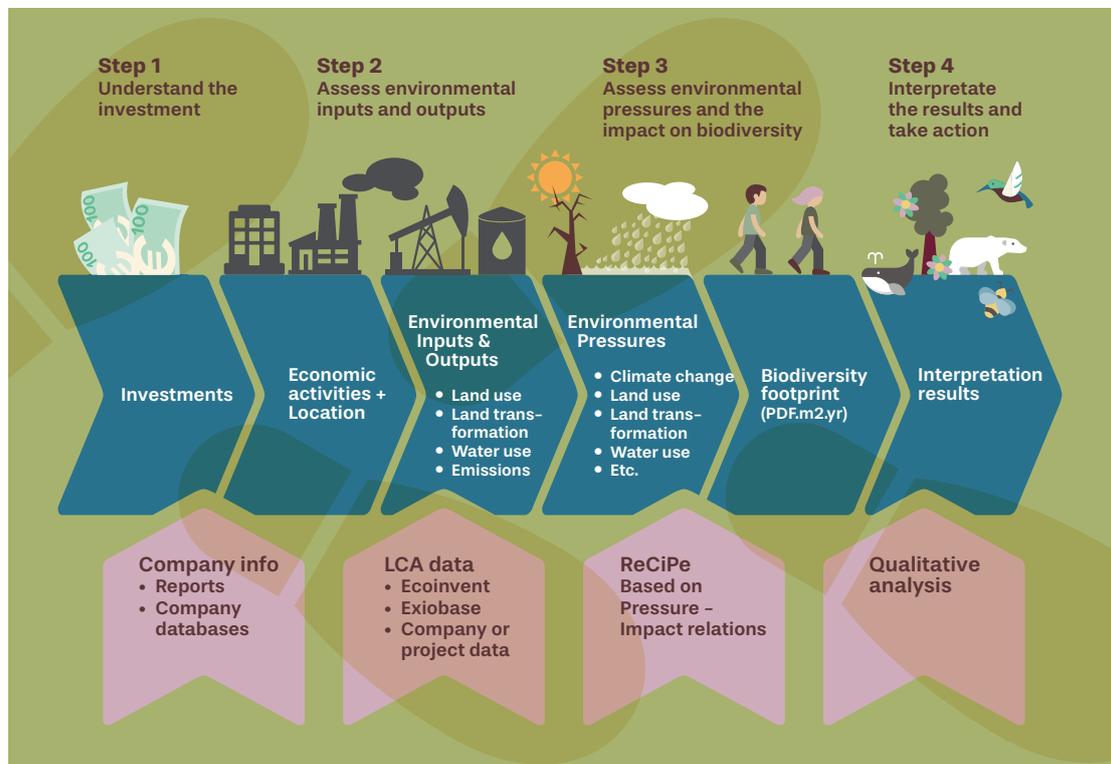


Figure 1: Impact assessment steps in the BFFI

In each of these footprinting steps, a number of definitions (e.g. how is biodiversity defined?) and impact assessment principles (e.g. what is the reference situation for the impact assessment?) will be relevant. Some of these definitions and principles are directly addressed in this chapter, some (more technical principles) are presented in chapters 3. Building on these steps, definitions and principles, chapter 4 provides an overview of the biodiversity footprinting approach for a selection of asset classes.

2.2 What is a biodiversity impact assessment or biodiversity footprint?

Most human activities impact biodiversity, either positively (e.g. reforestation activities) or negatively (e.g. agricultural and mining activities). These impacts can be measured and expressed as a biodiversity footprint. A biodiversity footprint can be based on monitoring of actual changes in biodiversity through time (assessment of actual impact), or by assessing the 'potential' or expected impact, based on the contribution of an economic activity to drivers of biodiversity loss or biodiversity gain (assessment of potential impacts).²

In addition to a quantitative calculation of a biodiversity footprint, a qualitative assessment can be used to analyse and address impacts not (yet) adequately covered by the quantitative footprint calculation. The complementary use of both assessments enable a correct interpretation of the footprinting results.

In the case of a biodiversity footprint for financial institutions, the footprint may focus on the impact of the financial institution itself (e.g. impacts resulting from land use and energy use by a bank's buildings) and on the impact of the economic activities the financial institution invests in. The latter impact will generally be much larger. This paper focuses on the biodiversity footprint of the investments and loans of a financial institution.

How does a biodiversity footprint relate to other footprints?

A biodiversity footprint is in many ways similar to carbon or water footprinting. However, contrary to carbon or water footprinting, there is no broadly accepted metric for a biodiversity footprint yet; there is no equivalent of an Intergovernmental Panel on Climate Change (IPCC) endorsed carbon metric.

Since the impact on biodiversity is the result of a number of environmental pressures, like climate change and water use, financial institutions that have already gathered data or conducted a footprint for carbon, water and/or other environmental themes can use this data in the assessment of the impact on biodiversity.

An important extra value of conducting a biodiversity footprint is the fact that the footprint will provide insight in potential trade-offs between policies addressing one or more of the underlying environmental pressures. For example, the biodiversity footprint will show if the climate benefits of the use of biomass as an energy source leads to trade-offs with regard to land use and water use. In other words, a biodiversity footprint allows a financial institution to make better balanced investment decisions considering all underlying environmental issues.

How does a biodiversity footprint relate to the EU Taxonomy?

The EU Taxonomy focuses on classifying economic activities that are environmentally sustainable, covering six objectives: (1) Climate change mitigation; (2) climate change adaptation; (3) sustainable use and protection of water and marine resources; (4) transition to a circular economy; (5) pollution prevention and control and (6) protection and restoration of biodiversity

² From 'Common ground in biodiversity footprint methodologies for the financial sector', ACTIAM, ASN bank, CDC Biodiversité, Finance in Motion, 2018.

and ecosystems. At a later stage, the EU taxonomy might be extended to the social dimension of sustainability.

The EU Taxonomy now covers the first two objectives, climate change mitigation and climate change adaptation, but is expected to extend its focus to the other objectives, including the protection and restoration of biodiversity and ecosystems. Technical screening criteria have been developed for activities which substantially contribute to this objective. Financial institutions that have conducted a biodiversity footprint will have a better understanding of the reasons why activities do or do not substantially contribute to the biodiversity objective and will be better equipped to play into the changes the EU Taxonomy will bring about.

2.3 Step 1 Analysis of the focus of the investment

Investments to be defined in terms of economic activities

Each investment in a business, organization or project needs to be defined in terms of the economic activities linked to the investment. This can be quite straightforward, e.g. in case of an investment in a mining or agricultural company, but can also be more challenging, e.g. in case of an investment in a company producing a wide range of products or services.

Scope: covering the entire value chain

An important question when calculating the biodiversity footprint of an investment is to what extent the financial institution takes responsibility for the impacts in the investees' value chain(s). For example, an investment in a sportswear brand selling sportswear, may be treated as an investment in a retailer when the sportswear brand does not produce the products itself. However, one might also argue that by investing in the brand, the financial institution is indirectly also responsible for the production of the sportswear products and the materials used in these products.

From the perspective of carbon footprinting, the inclusion of scopes 1 (impacts of the company itself) and 2 (impacts of the energy companies the company sources its energy from) is a generally accepted approach. The inclusion of the full scope 3 (the impact of suppliers and of sub-suppliers), however, is not. In biodiversity footprinting scope 3 should be included since the impact on biodiversity is typically highest in the supply chain: raw material production and processing, like agriculture and mining, mainly due to land use intensity and land use changes.

Identifying the indirect activities and impacts linked to an investment may be a challenge, depending on the data made available by investees. When direct data on supply chains are missing, the use of indirect data from databases may be necessary (e.g. the use of financial databases showing in what sectors a company's turnover is realised).

Attribution of impact

The following applies to the attribution of impacts on biodiversity (based on the PCAF attribution principles, PCAF The Netherlands, 2019):

- Follow the money is a key principle for the attribution of bio-diversity impacts to financial assets, i.e. the money should be followed as far as possible to understand and account for the biodiversity impact in the real economy.
- If the influence of the financial institutions on steering the investment is bigger, the proportional share of the footprint attributed to the investment should be larger.
- The denominator, i.e. the financial value of the asset that, in relation to the investment, determines the proportional share of biodiversity impact, should include all financial flows (i.e. equity and debt) to the investee as much as possible. When deviating from this, it should be made clear why.

2.4 Step 2 Analysis of the pressures induced by the economic activity

The impact assessment shall be relevant and cover the most important pressures
Five main pressures on biodiversity can be distinguished (IPBES, 2020):

- Habitat change (land use change and physical modification of rivers or water withdrawal from rivers) or Land/sea use change
- Overexploitation / Resource extraction
- Invasive alien species
- Pollution
- Climate change

For the biodiversity footprint to be relevant, the main pressures on biodiversity should be covered in this step. Drivers that cannot be included in the quantitative impact assessment should be covered by means of a complementary qualitative analysis (see also the example of the ReCiPe-model in the textbox below).

Environmental pressures in the ReCiPe model

Environmental pressures included in the ReCiPe model (also used by the BFFI):

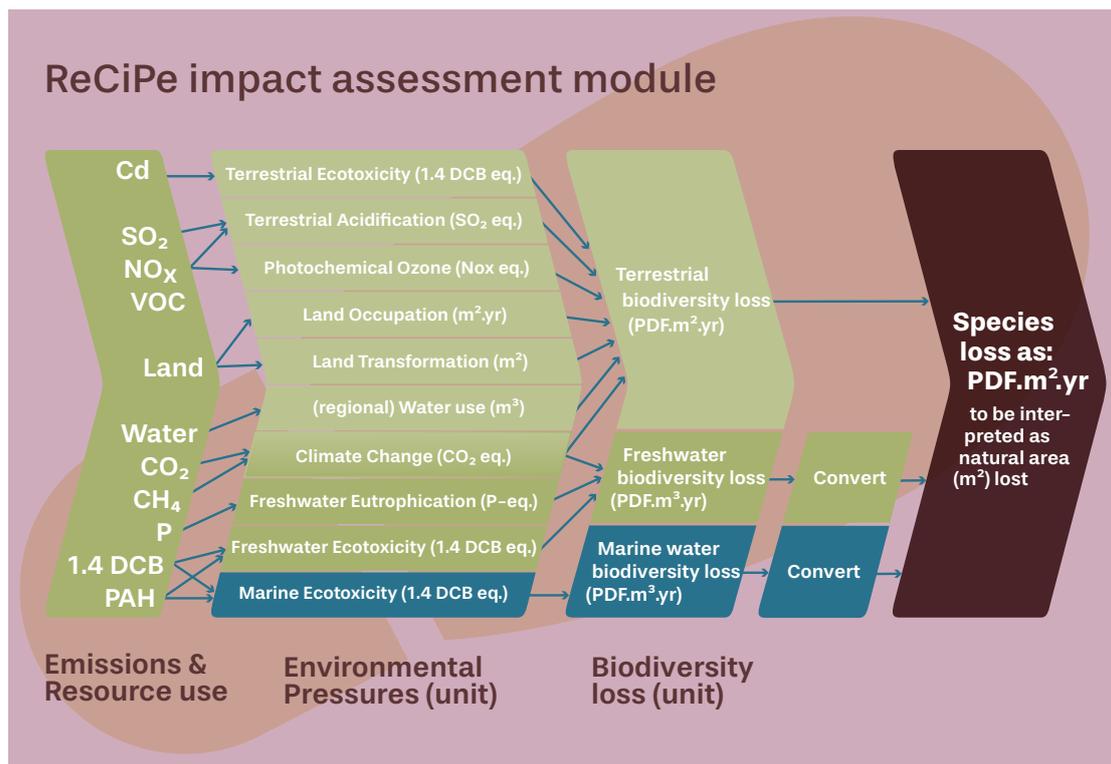


Figure 2: ReCiPe impact assessment module

As can be seen from this figure, the introduction of alien invasive species is not included in the pressures covered by ReCiPe. This means that the relevance and significance of this pressure needs to be covered by means of a qualitative analysis of the investments included in the footprint.

2.5 Step 3 Analysis of the impact on biodiversity

Quantitative link between pressures and impacts

Changes in the intensity of pressures must be translated into impact changes and the links need to be explicit and quantitative. This ensures that the impact assessment is responsive to change, relevant for companies and investors and results are replicable.

The spatial dimension of impact

Impacts on biodiversity have a spatial dimension in the sense that the impact takes place in a specific impact area (e.g. expressed in ha or km²). The impact area may be different for different pressures on biodiversity. For example, emissions contributing to climate change will have a global effect, while the emission of toxic substances will have a localised effect.

The time dimension of impact

Apart from a spatial dimension, impacts also have a time dimension. Land use for economic activities, reducing the level of biodiversity, may take place during a certain period of time and converted land may at some point in time become nature again. This time dimension also plays a role in emission related pressures. An emission does not cause an impact for eternity; it will, at a certain time, vanish or be converted in a less harmful substance. For instance, a methane emission will be converted into CO₂ after one or two decades, and this CO₂ will be absorbed by plants and oceans in one or two centuries. Likewise, many toxic substances will often have an impact during a few days or weeks before they break down.

TIME AND SPACE DIMENSION IN THE METRICS PDF AND MSA

Both the spatial and time dimension of impacts on biodiversity are taken into account in a biodiversity footprint. In the BFFI metric, PDF.m².yr, area and time are interchangeable, as long as the multiplication of PDF, area and time results in the same score. For example, a footprint of 5000 PDF.m².yr can have the following meanings:

- 50% species loss in 10 000 m² during 1 year or
- 50% species loss in 1 000 m² during 10 years or
- 5% species loss in 100 000 m² during 1 year.

The MSA metric (Mean Species Abundance) has the same composition of a spatial and a time dimension: MSA.m².yr. Note that PDF expresses the (potential) loss of species, while MSA expresses the abundance of species remaining. For this reason, in case of the MSA metric, a negative impact on biodiversity is often expressed as 1-MSA.m².yr.

How to deal with an impact which takes place over a longer period of time or only after a longer period of time?

As explained, environmental pressures may have an impact on biodiversity over a longer period of time. In a biodiversity footprint, the impacts over time are treated like they happen at one point in time (now). This so called 'time integration' of future impacts is the mainstream approach in life cycle assessment and is also used by, for example, the IPCC.

The same approach is used for claiming avoided negative impacts or positive impacts in a footprint: the impact is claimed in the footprint when the investment has been made, even if the actual impact may take several years to materialise (no discounting of future positive and negative impacts as of yet; this could however be part of future discussions). For example, in case of an investment in a water treatment plant, the expected/estimated long term impact on biodiversity is taken as the impact, even if this impact takes 10 years to materialise.

2.6 Step 4 Interpretation of the footprint result

2.6.1 Complementary qualitative analysis

Any quantitative biodiversity footprint will have its limitations from the viewpoint of the characterisation of the economic activities invested in, the data available to assess the environmental pressures and the pressure–impact models used to calculate the impact on biodiversity. These limitations shall be recognised, reported and taken into consideration in the interpretation and use of the footprint results. A qualitative analysis serves to put the quantitative results into perspective, to identify scope/methodological limitations and provide an assessment (quantitative and/or qualitative) of uncertainty.

CASE STUDY: ASN BANK: COMPLEMENTARY QUALITATIVE ANALYSIS

ASN Bank is using the Biodiversity Footprint Financial Institutions (BFFI) to calculate the biodiversity impact of the bank's investment portfolio since 2015. This methodology uses the ReCiPe pressure–impact model. When the first biodiversity footprint was executed in 2016, a qualitative analysis was conducted of the methodology, including the limitations of the ReCiPe model, the effect these limitations could have for the footprint results, the relevance/significance of this effect for the bank's investments and how these limitations could be addressed.

An example of the limitations discussed is the fact that the introduction of exotic invasive species is not included in the ReCiPe model. Because the introduction of invasive species can be an important driver of biodiversity loss, an analysis was made of the relevance/significance of this limitation looking at the

sectors ASN Bank invests in. For example, sectors like aquaculture, agriculture and forestry are high-risk sectors from the viewpoint of invasive species (the risk that invasive species are introduced is relatively high). This could mean that the footprint result (the calculated potential impact) of direct or indirect investments in these sectors is an underestimation of the actual impact.

In a next step an analysis was made of how this limitation can be addressed. One option that was explored is to see if this driver of biodiversity loss can be taken 'out of the footprint equation' through the use of invasive species related investment criteria for companies in or linked to high risk sectors, like paper producing companies. By requiring proper management of the risk of introducing invasive species or by requiring certification with a sustainability standard that addresses the intro-

duction of invasive species. For example, in case of paper producing companies, an investment criterion requiring FSC certification of forest or plantation will cover the issue. Since FSC certification is included in ASN Bank's investment policy, the introduction of invasive species will play a small role in the bank's investments in forestry related sectors.

Other limitations of the ReCiPe model and the data used were analysed in a similar way, resulting in insight in the footprint limitations and ways to deal with these limitations.

More information is available in the publication 'Towards ASN Bank's Biodiversity footprint; A pilot project', CREM, PRé and ASN Bank, 2016. (available through ASN Bank)

2.6.2 The role of science based targets

It is expected that 'science based targets' for biodiversity will be developed in the next few years. These science based targets may (this is not yet fully clear at the time of writing of this paper) provide insight in the level of biodiversity and the type of biodiversity needed/required in different regions and locations. Such science based targets may offer important guidance in the decisions regarding biodiversity positive investments and investments the avoidance of negative impact: does the estimated or calculated impact contribute to the science base target in the impact area influenced by the investment? When such science based targets become available,

it is recommended that these targets are used in the interpretation of the impact assessment/ footprint results.

2.6.3 The role of ecosystem services and value to society

The focus of this paper is limited to the assessment of impacts on biodiversity. From the viewpoint of local stakeholders and the sustainable development goals, investments in the conservation and sustainable use of biodiversity should take into account of the relations between biodiversity/ecosystem quality, the services the ecosystem provides and the beneficiaries of these services ('natural capital' thinking). In practice, impact investing can target any kind of impact, ranging from specific environmental benefits (like the impact on biodiversity) to specific social and economic benefits (like sanitation and livelihoods). Many of these benefits cannot be separated since the benefits to (local) people will also influence the permanence of biodiversity gain. Moreover, linking biodiversity conservation to the benefits for ecosystem services and people, will strengthen the support for investments in biodiversity and will offer guidance in the allocation of funds.

For this reason, it is recommended to always verify whether information on ecosystem services and beneficiaries is available and to take this information into account in investment decisions.

N.B.: Impacts on ecosystem services can also play a role from an investment risk perspective. All economic activities depend on ecosystem services, either directly (like agriculture depending on pollination services) or indirectly through supply chains. The loss of ecosystem services can therefore pose a risk to economic activities and the return on investment of investors.

A biodiversity impact assessment can potentially be expanded to an assessment of dependency risks. This is one of the possible next steps for PBAF (see chapter 6).



3 Principles underlying the assessment and disclosure of impact on biodiversity

3.1 Introduction

In this chapter, principles underlying the assessment and disclosure of an impact on biodiversity are described, including definitions and principles relevant in different steps of an impact assessment. In practice, an impact assessment may not (yet) be able to fulfil all of the principles presented. If this is the case, this shall be taken into account in the interpretation and use of the footprint results.

The following definitions and principles are discussed:

- Biodiversity: definition and focus of a biodiversity impact assessment
- Indicators and metrics
- Definitions of impact: negative impact, avoided negative impact and positive impact
- Reference situations: regular investments and impact investments
- Taking account of recent biodiversity loss and permanence of biodiversity gain
- Use of data: direct data versus indirect data and ex-ante data versus ex-post data

N.B.: It must be realised that the definitions and impact assessment principles presented here are never final. When the experience with biodiversity impact assessment grows, definitions and principles will further develop in order to address footprinting challenges encountered. Moreover, definitions and principles may change when the context of biodiversity footprinting changes. For example, when science based targets for nature are established and/or the availability of impact data from investees changes.

3.2 Biodiversity: definition and focus of a biodiversity impact assessment

Definition of biodiversity

PBAF uses the definition of biodiversity from the convention text from the Convention on Biological Diversity (CBD):

“Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.”

Biodiversity focus of a biodiversity impact assessment

PBAF values biodiversity as the life support system for society and acknowledges its intrinsic value. PBAF believes there are several reasons why it makes sense to seek to protect all biodiversity and not just endangered species, charismatic species or species supporting specific ecosystem services:

- Biodiversity maximizes ecosystem resilience, thereby securing the future of current ecosystem services and contains an 'option' on ecosystem services that have yet to be discovered or used.

- Ecological functionality depends on common as well as charismatic or endangered species. It is therefore necessary to assess the changes in the populations of common species to maintain these functions. Focusing only on species extinction risk overlooks rapid declines in the number of individuals of species that are not at risk of extinction.
- The intrinsic value of biodiversity prevents a focus on ecosystem services only.

PBAF partners focus on biodiversity as a whole and not on ecosystem services or endangered species. PBAF believes not only terrestrial, but also fresh water and marine biodiversity needs to be covered.

3.3 Indicators and metrics

According to the Biodiversity Indicators Partnership (BIP), an indicator can be defined as a 'measure based on verifiable data that conveys information about more than just itself'. This means that indicators are purpose dependent – the interpretation or meaning given to the data depends on the purpose or issue of concern.

According to the BIP, experience has shown a number of key factors in determining whether an identified indicator is taken up and produced over time:

- Scientifically valid – a) there is an accepted theory of the relationship between the indicator and its purpose, with agreement that change in the indicator does indicate change in the issue of concern; b) the data used is reliable and verifiable.
- Based on available data – so that the indicator can be produced regularly over time.
- Responsive to change in the issue of interest.
- Easily understandable – a) conceptually, how the measure relates to the purpose, b) in its presentation, and c) the interpretation of the data.
- Relevant to users' needs.
- "Championed" by an institution responsible for the indicator's continued production and communication.
- Used – for measuring progress, early-warning of problems, understanding an issue, reporting, awareness-raising, etc.

In biodiversity impact assessment, widely used metrics include the 'Mean Species Abundance' (MSA) metric and the 'Potentially Disappeared Fraction of Species' (PDF) metric. The PDF is used in the ReCiPe pressure-response model (see also 2.4) as an indicator for ecosystem quality, while the MSA is used as an indicator for biodiversity intactness. Impacts are described by means of an increase or decrease in the number of species, taking into account a spatial factor (the area where the impact takes place) and a time factor (the assessment period). Both MSA and PDF can be used across all sectors and across all countries and (eco)regions.

3.4 Definitions of impact

In order to be clear about what is meant with terms like negative impact, avoided impact, positive impact and net impact, the definitions below show how these terms are defined for *the purpose of this common ground paper*.

Potential impact versus actual impact on biodiversity

A potential impact on biodiversity is the impact on biodiversity that might take place as a result of changes in the drivers in biodiversity loss and gain. Whether this potential impact will result in an actual impact also depends on the characteristics of the impact location. For example, water use is an important driver of biodiversity loss. Therefore, the use of water has a potential impact on biodiversity. The actual impact of water use will depend on, amongst others, the level of water scarcity in the impact area. The assessment of actual impacts on biodiversity will

require monitoring of changes in biodiversity over a longer period of time and may be costly and time consuming.

A biodiversity footprint can be based on a calculation of the potential impact on biodiversity, focusing on changes in drivers of biodiversity loss and gain, on an assessment of actual impacts on biodiversity (which requires monitoring data) and on a combination of both.

In case of a biodiversity footprint of an investment portfolio, the assessment of actual impact will often not be feasible, which means that the potential impact is calculated. This potential impact provides insight in the relations between investments and drivers of biodiversity loss and gain. This insight can be used to address these drivers (e.g. through engagement).

Negative impact

A negative impact means a (potential) loss of biodiversity resulting from interventions/economic activities compared to a reference situation (see 3.5). A negative impact may be the result of a direct negative impact of the activity itself and/or an indirect negative impact taking place in the supply chains and use phase of a product/service. In practice, when an economic activity is said to have a negative impact, it is often meant that the activity has a net negative impact. This means that the direct and indirect negative impacts of the activity exceed the direct and indirect positive impacts of the activity (see 'Net impact').

Avoidance of negative impact

The avoidance of negative impact on biodiversity refers to the reduction or prevention of negative impacts resulting from an intervention/economic activity by means of, for example, better management practices or the replacement of raw materials with a high impact on biodiversity with raw materials with a lower impact on biodiversity. The avoided negative impacts can refer to existing impacts, but can also relate to future, expected impacts. An example of the latter is the production of non-timber forest products which may prevent (future) deforestation by creating value for a forest.

Positive impact

A positive impact means a (potential) gain in biodiversity resulting from interventions/economic activities compared to a reference situation (see 3.5). An example of such an intervention is reforestation or nature restoration. In practice, when an economic activity is said to have a positive impact, it is often meant that the activity has a net positive impact. This means that the direct and indirect positive impacts of the activity exceed the direct and indirect negative impacts of the activity (for a discussion on net impacts, see below).

Net impact

The impact of an economic activity can be negative, positive or neutral (no impact) compared to a reference situation (see 3.5). Summing positive and negative impacts to calculate a net impact is debatable, since impacts may take place at different locations and even in different regions. For example, a wind park may have a negative impact on biodiversity through the use of raw materials (like metals which need to be mined) and a positive impact through avoided greenhouse gas emissions (use of wind as an energy source instead of fossil fuels). A large part of the indirect negative impacts resulting from the use raw materials will probably take place in other countries (e.g. mining in India), while the positive impact of avoided greenhouse gas emissions takes place at a global scale. Calculating a net impact implies that a negative impact in location A can be compensated with a positive impact in location B, which is, of course, not true. The consequences of biodiversity loss to stakeholders in location A cannot be compensated with the benefits of biodiversity gain to stakeholders in location B.

Although negative, avoided and positive impacts cannot just be added up to calculate a net impact, in practice the calculation of a net impact is sometimes used as a way to compare investments in different companies, projects and asset classes. Further guidance on how to deal with net impacts may be developed by PBAF at a later stage.

For more information on the spatial dimensions and time dimensions of impact, see section 2.5.

3.5 Reference situation

To assess the impact on biodiversity of an investment in an economic activity or 'intervention' (an action that is expected to lead to an impact on biodiversity), a 'reference' or 'baseline' needs to be defined: a negative or positive impact compared to what? The choice of this reference will directly influence the assessment of the impact and is different for negative impacts and avoided negative or positive impacts:

Reference situation negative impacts

The negative impact on biodiversity of an economic activity is the result of the environmental pressures linked to this activity in a specific impact area. These pressures are caused by inputs (like water use, use of raw materials and land use) and outputs (emissions to air, water and soil). To calculate the impact of the activity, the baseline is the situation in which the activity does not take place (no land use, no water use, no emissions, etc.). This results in the 'absolute' impact. An investor that invests in such an economic activity is considered to be (partly) responsible for this (absolute) negative impact (see the attribution of impact in 2.3).

REFERENCE SITUATION FOR LAND USE IN THE RECIPE MODEL

To assess the impact on biodiversity of land use, a comparison is made with the level of biodiversity without human activities, using the 'potential natural vegetation'. The potential natural vegetation (PNV) describes the expected state of mature vegetation that would develop if all human activities were to be stopped at once. The species richness of the PNV is approximated using monitoring data from current, (semi-) natural habitats, which are considered a valid reference if they are located within the same ecoregion (De Baan et al. 2013) or biome (Elshout et al. 2014) as the land use situation. The species richness in different types of natural vegetation can vary significantly (e.g. tropical rain forest vs. tundra) and characterisation factors (CFs, factors in the impact calculation that represent the level of biodiversity) will vary accordingly. The ReCiPe model assumes that nature will restore over time once human activities are stopped. Passive recovery times are assumed in calculating the midpoint CFs for land relaxation. This means that for the default land use scenario's, active measures to restore nature are not included."

This approach is comparable to the calculation of absolute impact in a carbon footprint, where the baseline is zero greenhouse gas emissions.

Reference situation avoided impact or positive impact

In case of an avoided negative impact, resulting from actions like better management practices or the use of green energy, the baseline is the situation in which these actions do not take place; the 'business as usual' situation. The impact calculated is a 'relative' impact. An investor that invests in such actions is considered to be (partly) responsible for this avoided negative impact. The same is true for actions with positive impacts on biodiversity, like nature restoration. The baseline is the situation in which the action does not take place, the 'business as usual' situation.

This approach is similar to the calculation of relative impact in a carbon footprint, like the footprint of green energy, which is calculated using energy from an energy mix as the baseline (resulting in avoided impact).

In order to limit the chances of overstating the avoided negative/positive impact realised, it is important to be conservative in the choice of the baseline (the level of biodiversity in the business as usual situation). Moreover, the choice of the business as usual situation needs to be transparent and supported with sufficient evidence.

WHY A DIFFERENT REFERENCE SITUATION?

The need for different reference situations can be illustrated by the example of an impact investor investing in the preservation of biodiversity on an existing coffee plantation:

Assumed data (fictional):

- The level of biodiversity of the traditionally managed coffee plantation area is 2
- The level of biodiversity in the area without the coffee plantation (the potential natural vegetation) is 5
- The impact investor invests 1 million in agroforestry measures on the coffee plantation, resulting in a level of biodiversity of the coffee plantation of 3 (an increase of biodiversity of 1 compared to the traditionally managed plantation)
- The total market value of the coffee plantation is 10 million

We can distinguish two options:

- If the impact assessment is treated as an assessment of (absolute) negative impact, the reference situation is the situation without the coffee plantation, with the potential natural vegetation. The investor is held responsible for: $(1 \text{ million} / 10 \text{ million} = 10\% \text{ attribution of impact}) * (5 - 3 = 2 \text{ biodiversity loss}) = 0,2 \text{ biodiversity loss}$
In other words, the biodiversity impact of this investment is negative

- If the assessment is treated as an assessment of (relative) avoided negative impact, the 'business-as-usual' situation is taken as a reference and the impact investor is held responsible for:
 $(1 \text{ million} / 10 \text{ million} = 10\% \text{ attribution of impact}) * (2 - 3 = -1 \text{ biodiversity loss}) = -0,1 \text{ biodiversity loss}$
Since a negative loss is a gain, the biodiversity impact of this investment is positive.

The example shows that a different reference situation is needed to reward the impact investor in a biodiversity footprint. From the viewpoint of the overarching objective (contributing to the conservation and sustainable use of biodiversity) the choice for two references is necessary.

Both reference situations are often used to calculate impact

Both reference situations may play a role in an impact assessment. For example, to calculate the impact on biodiversity for a recycling company, the avoided negative impact on biodiversity resulting from recycling is calculated using the 'business as usual' situation as a reference: the use of virgin materials. To calculate the negative impact of the actions needed to enable recycling, like land use for the recycling plant and transport of waste, the situation without these activities is used as a reference.

CASE STUDY: BIODIVERSITY IMPACT OF BRAZIL NUT HARVESTING

This case study focuses on a private debt investment to a producer of wild Brazil nut in Bolivia. Brazil nut trees grow only in the wild. The source of income they provide for the local communities who harvest them incentivize the protection of the Amazon forest where they grow and discourage more harmful activities such as logging or slash and burn farming. Hence this investment aims to generate a positive impact on biodiversity by allowing the Brazil nut company to increase the number of communities it sources its product from and thereby increasing the area of the Amazon forest that is under protection. In addition, the company has set-up its operations in such a way that they are sustainable, processing products close to the collection areas and running on solar power.

For big (multinational) companies with long value chains, site specific data on the beginning of the value chain is often missing. In this case, modelling the impact with sector average data is an acceptable, second best approach. For investments in small and medium-sized enterprises (SME), such as the Brazil nut company, direct data can more easily be collected because their activities are better traceable to a specific location. This allows for more detailed biodiversity impact modelling. Furthermore, when such SME-related or project investments are made with the purpose of generating a positive impact on biodiversity it is likely that there are SME/project-specific data available on this (expected) positive impact.

The following steps are taken to calculate the impact of the investment in the Brazil nut company:

1. Calculation of the negative impact on biodiversity

The negative impact on biodiversity of the harvesting of Brazil nuts is the result of the environmental pressures linked to this activity, like emissions from transport and processing. The negative impact is calculated using the situation in which the activity does not take place as a reference/baseline. Data on the environmental pressures of Brazil nut harvesting are either based on specific data from the company/project, or (if such data are not available) on sector average data from database like EXIOBASE. EXIOBASE provides country specific, sector average environmental data for the 'Cultivation of vegetables, fruit, nuts'. This dataset includes the inputs from nature (such as land and water), inputs from other sectors (e.g. energy and other purchased goods like fertilizer, transport), and direct emissions (like greenhouse gas emissions, particulate matter and emissions of pesticides).

2. Calculation of the avoided negative impact on biodiversity

The avoided negative impact of Brazil nut harvesting is calculated using the 'business as usual' situation as a baseline: the situation in which the investment does not take place. In this case, the harvesting of Brazil nuts is expected to prevent slash and burn agriculture, which would take place in a business as usual situation. The avoided negative impact is calculated by comparing the level of biodiversity in a forest where wild Brazil nuts are harvested to a situation of (slash and burn) agriculture. Scientific data on the level of biodiversity in different land use types and forest manage-

ment types can be used to estimate the avoided loss in biodiversity (unless better data are available).

In order to limit the chances of overstating the avoided negative impact realised, it is important to be conservative in the choice of this reference situation/baseline. Moreover, the choice of the baseline needs to be transparent and supported with sufficient evidence.

3. Interpretation of the results

The chart shows a fictive calculation of the impact of the investment in a Brazil nut project. In this example, the avoided negative impact is significantly higher than the negative impact of Brazil nut harvesting. This means that there is some negative impact from the wild Brazil nut producer, but the negative impact would be much higher if this project would not take place.

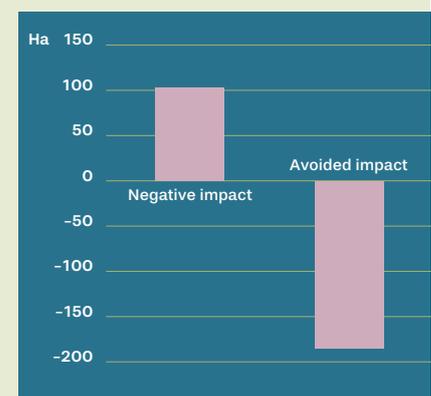


Figure 3: Impact from Brazil nut harvesting. The chart shows the negative impact of Brazil nut harvesting and the avoided impact compared to the business as usual scenario (slash and burn agriculture). The results are in PDF.ha.yr (expressed in ha).

3.6 Recent biodiversity loss and permanence of biodiversity gain

In case of impact investments with the aim to avoid negative impacts or create positive impacts, it is important to take into account the risk of biodiversity loss preceding the investment and the permanence of biodiversity gain. Whether and if yes, how to include both topics in a footprint calculation has not been decided yet. This may be part of future PBAF discussions.

Recent biodiversity loss

In order to ensure that impact investment with a biodiversity focus contributes to the conservation and sustainable use of biodiversity, these investments shall take notice of potential recent biodiversity losses which can be linked to the economic activity invested in (like clearing primary forest that can be causally linked or attributed to a plantation). Since it is not possible to define a single criterion or rule (comparable the 'cut off' date in the RSPO and RTRS standards) on how to deal with such risks for the wide variety of biodiversity related impact investments, an investor should include an analysis of this risk in its investment decision. e.g. using data from local NGOs and/or tools like satellite monitoring. This risk of recent biodiversity loss is not (yet) included in the calculation of a biodiversity footprint.

Permanence of biodiversity gain

The sustainability of the impact shall be taken into account in case of investments aiming for an avoided negative impact or a positive impact. What happens to the level of biodiversity after the project/investment has ended? For example, part of the long term viability of the biodiversity invested will depend on the connectivity to other landscape elements and the regional context ('Resource Paper – No Net Loss and Loss-Gain Calculations in Biodiversity Offsets', BBOP, 2012). This should be addressed in projects aiming for a biodiversity gain.

The World Bank Group publication 'Biodiversity offsets: A User Guide' (October 2016) discusses the following features of successful long-term conservation:

- Formal legal protection
- On the ground protection and management
- Financial sustainability

Although it may be possible to address the permanence of biodiversity gain in the investment process and conditions, it is accepted that permanence cannot always be guaranteed. This uncertainty is not necessarily incorporated in a biodiversity footprint (e.g. by using a risk factor).

3.7 Use of data

Different type of data can be used in a biodiversity footprint to calculate the impact on biodiversity of an economic activity. A distinction can be made between direct data and indirect data and between ex-ante data and ex-post data.

Regardless of the type of data that is being used to assess the pressures on biodiversity, data use and methodological decisions should be fully transparent to allow for a traceable and replicable assessment.

3.7.1 Direct data versus indirect data

In general, the use of direct data provided by investees (companies, projects) can be more accurate than the use of indirect data. However, gathering direct data may be too time consuming and too costly (e.g. in the case of a biodiversity footprint at the level of an investment portfolio) or may not be available. In that case, indirect environmental data from databases like EXIOBASE (see textbox) and ecoinvent may be used to calculate a biodiversity footprint. Other

sources of indirect data include data from literature on (for example) different types of land use and related impacts on biodiversity.

However, since it is the responsibility of the investee to provide the data required to assess the impact on biodiversity, it is recommended to always ask investees for biodiversity impact data and provide support where possible.

3.7.2 Ex ante data versus ex post data

Ex-ante impact data, i.e. the estimated future impact of an investment, are collected before an activity takes place, e.g. to support funding decisions in case of project finance. Such data may include both direct data and indirect data. Ex-post measurement involves actual impact data collected after an activity, like a project, is implemented. In general, an ex-post measurement of actual changes in biodiversity can be more accurate than the ex-ante calculation of potential impacts, provided a monitoring system is in place and the data is collected by trained staff.

When *ex-post* monitoring data of actual impacts become available (e.g. during the implementation of a project), these data shall be compared with the *ex-ante* data on estimated impact. In case of significant differences between actual impact and estimated impact, these differences shall be analysed. The result shall be used to either adjust the estimated impact or improve the quality of monitoring. In those cases where a loan is paid back or an exit is made before the impact has (fully) materialized, the investor preferably uses ex-post monitoring data available at the time of the exit and ex-ante data on estimated impact from that date onwards to assess the impact.

EXIOBASE

The **EXIOBASE database** is a public database covering 43 countries, that together represent 90% of the World's economy and 5 'Rest of the World' regions that cover the remaining 10% of the economy. It has collected data for all 48 regions on economic activities, environmental inputs (like resource use, land use) and outputs (like emissions) and some social aspects. The database distinguishes 163 industrial and service sectors. The trade flows between these sectors are also specified, which leads to millions of trade flows. There are also some special categories, like the activities caused by the total consumption in a country and the impacts of government expenditure and purchases.

EXIOBASE can be used to assess the environmental inputs and outputs of an investment in a sector, in a specific country. Since the trade flows of the sector are included in the database, the indirect impacts of supply chains (linked to this sector) can be included. This also means that if a company is defined by the revenue it realises in different sectors, the environmental impact of the company can be calculated.

There are some important limitations to this approach. First of all, EXIOBASE provides average input/output data for a sector in a country, not for individual companies. Secondly, dividing an economy in 163 sectors provides a rather coarse classification of economic activities. If an investment is made in a specific industrial activity, it may not always be clear to which sector it belongs. For companies active in sectors with very heterogeneous products, the EXIOBASE dataset might not be very representative for the products manufactured by the company under assessment.

Although the EXIOBASE database has its limitations, it can be used in a footprint calculation to gain insight in the most likely location of biodiversity impact hotspots in an investment portfolio. Based on the result, the next step could be a more detailed assessment for these impact hotspots, based on more specific, direct data (when available).

Combinations of data

In practice, an impact assessment of an investment portfolio often involves the combination of different types of data. For example, indirect data from databases are used to calculate the impact of listed equity while direct data from projects are combined with data from literature to assess the ex-ante, expected/estimated impact on biodiversity.

For an illustration of the use of indirect data in the calculation of a biodiversity footprint for listed equity, see the case study on a dairy company in paragraph 4.3.

3.7.3 Biodiversity impact data of certification standards

Many financial institutions refer to the use of certification standards in their investment criteria. Some of the certification standards are widely accepted as being beneficial to biodiversity, like the FSC or MSC certification standard. The use of these certification standards is preferably reflected in the assessment of a biodiversity footprint, in order to award and stimulate the use of the standard. However, data on the impact of certification standards is often still limited or lacking. Moreover, impact assessments can be based on sector average data (like data from the EXIOBASE database), not reflecting the use of a certification standard.

FSC CERTIFICATION AND LAND USE

In case of FSC (Forest Stewardship Council) certification, average impact data for forestry-related land use can be replaced by impact data reflecting the type of forest management required by FSC certification. To do this, data can be used from the publication 'Impact of Forest Management on Species Richness' from Chaudhary et al³.

If a certification standard includes requirements aimed at reducing specific environmental pressures, compared to standard practices, this reduction can be taken into account in the impact assessment, provided there is data to back this up. For example, in case of a certification standard for sustainable agriculture, average data on water use and pesticide use from a database can be replaced by data matching the requirements of the label or data available for a specific farm.

However, sometimes, data is not available. A (temporary) solution to the lack of impact data and the use of average sector data is the use of certification specific 'impact correction factors' for the certified resource (e.g. X% impact reduction for using a product certification compared to the sector average). This approach is accepted as a temporary solution until more accurate data are available, provided:

- The certification standard is a member of ISEAL.
- The certification standard explicitly addresses the avoidance of negative impacts on biodiversity and/or the enhancement of biodiversity.
- Sufficient evidence is available on the contribution of the certification standard to the avoidance of negative impacts on biodiversity and/or enhancement of biodiversity.
- The impact correction factor takes into account the percentage of produce which has been certified when applying the correction factor to assess the impact of a production company.
- There is no evidence of net negative impacts associated with the certification

Developing a list of certification standards that meet these criteria could be part of future work by PBAF. The decision to reward a standard/certification with an impact correction factor will be made on a case-by-case basis. In case such impact correction factors are used, this is reported explicitly, including information on:

3 Chaudhary et al. (2016), 'Impact of Forest Management on Species Richness'.

- The certification standard for which an impact correction factor is used.
- The evidence supporting the expectation that the certification standard will contribute to the avoidance of negative impacts on biodiversity and/or enhancement of biodiversity.
- The correction factor used and an explanation of the magnitude of this factor.



4 Biodiversity footprinting methodology per asset class

4.1 Introduction

This chapter describes the biodiversity footprinting approach for different asset classes. All methodologies build on the overarching principles outlined in the previous chapter. The asset classes covered in this paper are:

- Sovereign bonds
- Listed Equity
- Project finance
- Mortgages
- Investments in green energy
- Indirect investments

Each of the paragraphs below covers an asset class and includes a table with a fixed format (see below) outlining the footprinting requirements, enabling a direct comparison between asset classes.

	Requirement
Scopes covered	Decision on minimum requirements.
Portfolio coverage	Decision on minimum requirements.
Attribution	How is the investor's share of the total impact of the investee attributed?
Data	What data to use? What considerations are important for this decision?
Reference situation	What is the reference situation for the impact assessment?
Absolute vs. relative impact	<p>What type of impact metric needs to be presented and how should the reporting institution arrive at this?</p> <p>An example of an absolute impact metric is the impact of an investment expressed as the percentage or fraction of species that are no longer found due to a man-made impact of some kind (PDF = potentially disappeared fraction of species), calculated with the surface area or water volume and the time.</p> <p>An example of a relative impact is the impact on biodiversity per euro invested.</p>
Avoided impact	A description of how to account for avoided impact when applicable.
Asset class specific considerations	Room for additional, asset class-specific considerations.
Limitations	The limitations of the proposed methodology are briefly discussed.

4.2 Sovereign bonds

A sovereign bond is a 'debt security' issued by a national government. Sovereign bonds can be denominated in a foreign currency or the government's domestic currency. The biodiversity footprinting requirements regarding sovereign bonds are outlined in the table below.

Topic	Requirement
Scopes covered	<p>A sovereign bond is considered to be a debt security issued by a central government to support government spending. As such, the sovereign bond lead to impacts caused by the central government's own operations, predominantly by how the government finances other sectors within the country. According to the follow the money principle, scopes 1, 2, and scope 3 purchased goods and services of the government are covered.</p> <p>For steering and risk mapping purposes it is useful to see what parts of governmental spending are most exposed to biodiversity impacts. A separation of scopes will allow government decision makers to draw informed conclusions</p>
Portfolio coverage	All bonds should be covered.
Attribution	Attribution is proportional to the exposure of the financial institution (the sum invested in a sovereign bond) to the government debt plus equity. As government equity is often not disclosed and a financial institution cannot invest in government equity, only government debt can be used as a denominator.
Data	<p>eurostat provides up-to-date and credible data on a country's gross debt. By dividing a financial institution's investment in a country's sovereign bonds by the country's gross debt, the attribution factor can be calculated</p> <p>The biodiversity impact of government expenditure can be calculated using EXIOBASE data for 'Final consumption expenditure by government'.</p>
Reference situation	<p>The reference situation or baseline in case of sovereign bonds is the situation in which the economic activities linked to the government's spending would not have taken place.</p> <p>When green bonds are issued by a government, underlying projects may aim for avoided negative impacts or positive impacts. The impact of such projects will be assessed using a business as usual situation as a reference. See also section 3.5.</p>
Absolute vs. relative impact	The methodology results in an absolute impact on biodiversity for each sovereign bond invested in, which can be aggregated as total impact for the sovereign bond portfolio. This information can be translated into a relative impact to report the impact on biodiversity per euro invested in sovereign bonds. The latter enables a comparison of relative impact between countries and between different asset classes, showing where impact hotspots in an investment portfolio are (likely to be) located.
Avoided impact	<p>Green bonds issued by a government could lead to avoided impact. How this should be accounted for will need to be assessed on a case by case basis (also see 'reference situation').</p>
Asset class specific considerations	<p>State-owned companies are not included in this analysis. Their impact could be attributed to scope 3 of government bonds but it is not certain if state-owned companies are already taken into account in the money flows of economic input-output tables. There is also no publicly</p>

	available database with state-owned enterprises per country. Including state-owned enterprises is recommended but requires governments to disclose this information.
Limitations	No specific limitations, other than limitations resulting from the quality of the data used.

4.3 Listed equity

The biodiversity footprinting requirements regarding listed equity are outlined in the table below.

Topic	Requirement
Scopes covered	The biodiversity footprint should cover scope 1, 2 and 3. Including scope 3 is important since many impacts on biodiversity will originate in primary production, like agriculture and mining. The indirect impacts on biodiversity from the production of raw materials purchased, product or service use and the product end-of-life phase are often significant and higher than the direct impact of a company's operations. Assessing the impacts throughout the entire value chain is therefore critical to properly account for impacts and look for actions that can effectively reduce these impacts, like engagement and the use of biodiversity related investment criteria.
Portfolio coverage	Ideally, 100% of the investment portfolio is covered. If this is not feasible, at least the majority of the portfolio should be covered and an indication should be provided for a pathway to full coverage. Provide an explanation of which financial product types (futures, ETFs, fund of funds, external mandates, prefs) were included or excluded and what the main method was for estimating missing portfolio data. Cash positions can be considered as having zero impact. Short positions can be ignored.
Attribution	Impacts are attributed to equity investors as 'owners' of the companies. In other words, attribution in this case is the ratio of invested value per company over the total market capitalisation (market value of all of a company's outstanding shares) of this company. This follows the so-called ownership approach and is aligned with financial reporting and consolidation rules. It also aligns voting rights and rules for reporting substantial interest in listed companies and is aligned with the principles in the GHG Protocol.
Reference situation	The reference situation in case of listed equity is the level of biodiversity when the economic activities linked to the equity would not have taken place. In those case where listed equity is focusing on business activities aiming to avoid negative impacts on biodiversity, the business as usual situation shall be used as a reference to calculate the avoided impacts. For example, in case of listed equity of a company producing meat substitutes, the avoided impact on biodiversity is calculated using the impact of meat consumption in the business as usual situation. The net avoided impact is calculated by also taking into account the negative impacts of producing these substitutes.
Data	No preferred resource is recommended. Data should be transparent, consistent, fit for purpose and as much as possible broadly accepted by the scientific community. Actual, direct data provided by companies should be preferred over indirect, estimated or averaged data from databases.

	If actual, direct data are not available or the use of direct data is not feasible (e.g. due to the amount of data needed in case of footprint on portfolio level), the use of indirect data is accepted provided that this is reported explicitly and taken into account in the interpretation of the footprint results.
Absolute vs. relative impact	The methodology results in an absolute impact on biodiversity for each listed equity invested in, which can be aggregated as total impact for the listed equity portfolio. This information can be translated into a relative impact to report the impact on biodiversity per euro invested in listed equity. The latter enables a comparison of relative impact between different asset classes, showing where impact hotspots in an investment portfolio are (likely to be) located.
Avoided impact	If the impact of a company is positive because of avoided impacts, for example in case of the production of 'green energy' (avoided greenhouse gas emissions), the avoided impact can be included in the overall footprint on a portfolio level. This avoided impact should be reported separately from negative impacts and biodiversity positive impacts (see chapter 4).
Other considerations	When it is clear that the companies invested in have taken specific measures to limit their impact on biodiversity, e.g. by sourcing certified raw materials/produce, such measures should be taken into account as much as possible. When indirect, estimated or averaged data are used, impact correction factors may be considered to take account of these measures. The footprint should be fully transparent about the steps taken.
Limitations	In case of the use of indirect data from databases, the footprint will not be responsive to biodiversity action by the companies involved in the listed equity invested in. When the footprint shows that the listed equity invested in constitutes a potential biodiversity impact hotspot, it is advised to zoom in on the companies concerned and assess to what extent these companies have addressed the drivers of biodiversity loss responsible for the impact calculated. The result should be integrated in the footprint to the extent possible.

CASE STUDY: BIODIVERSITY FOOTPRINT OF INVESTMENTS IN LISTED EQUITY

When a financial institution wants to calculate a biodiversity footprint for an entire investment portfolio with dozens to hundreds of companies, a detailed impact assessment for each company will not be feasible, unless the data to do this are readily available. This is not yet the case. For this reason, a 'screening approach' is chosen using the data companies are reporting externally and data from publicly available datasets. This approach can also be used in a biodiversity footprint for listed companies. Below, the foot-

print for a fictive dairy company (company A) is presented, using the BFFI methodology as an example.

The first step in assessing the biodiversity footprint of dairy company A is to analyse the activities of the company. In the BFFI methodology this is done using the revenue generated by the company per sector and country. Data on revenue can be found in annual reports. Company A generates its revenue in three sectors: Dairy and Plant Based Food Products, Specialized Nutrition and Water.

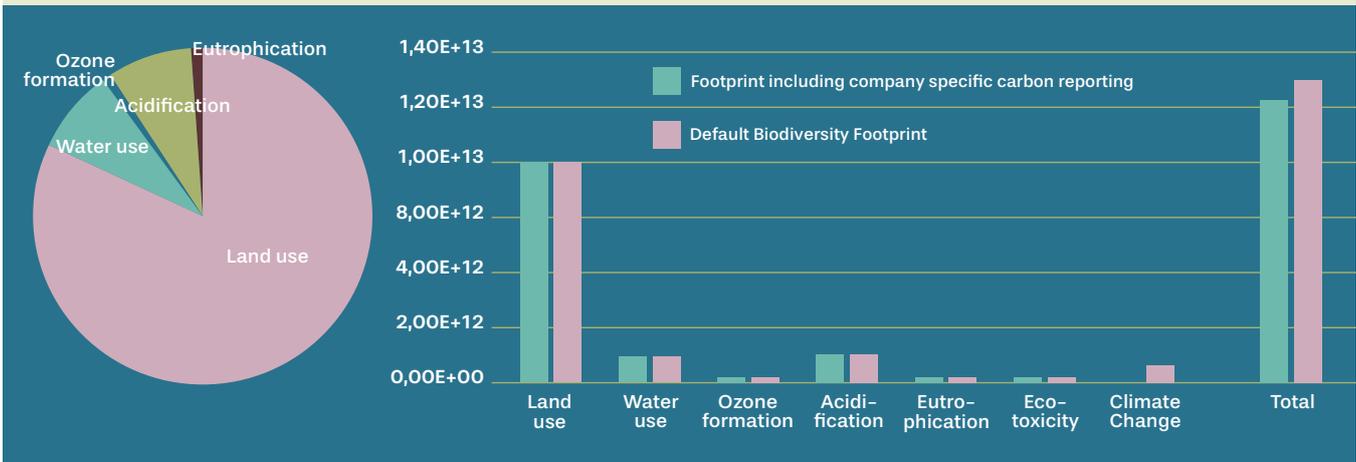
Therefore, the environmental input and outputs of these sectors are used for the footprint calculation.

The second step is assessing the environmental inputs and outputs, using (country specific, sector average) data from the EXIOBASE database. To use this database, a selection needs to be made of the sectors and countries or regions involved. Based on the revenue of company A, the following sectors are selected in EXIOBASE: Processing of Dairy products, Cultivation of Plant-

Based Fibers and Manufacture of Beverages. The dairy company reports the revenue very roughly in three regions; Europe and North America, France and the 'Rest of the World'. In the footprint analysis, the revenue reported per region is split evenly over the different countries in those regions.

In the figure below the impact on biodiversity is split by driver of biodiversity loss and a comparison is made between the impact with and without (the 'default' footprint) company specific emission data. Results can also be split by division, sector or region (not included in the figure below).

More specific calculations with publicly available data can be made when listed companies start reporting on their land and water use. Land use however, is rarely reported. Sometimes companies report their total water use, but not their water use per country or per watershed. Disclosure of site specific informa-



In the next step, these data are used to calculate the environmental pressures resulting from all products sold by the company in 2019. These pressures are translated into a potential impact on biodiversity using the ReCiPe pressure-impact model. The resulting biodiversity footprint is specific for the activities of the company (the products sold), but is based on sector average environmental data. To make this footprint more accurate, sector average data can be replaced with company specific data, if these are available. Our dairy company is reporting on the carbon impact of its own operations (scope 1), its energy purchases (scope 2) and the carbon footprint of its suppliers (scope 3). Assuming these data are accurate, the use of these data instead of average data will make the footprint more accurate.

Figure 4: Biodiversity impact of dairy company A split by driver of biodiversity loss (left) and the biodiversity footprint of the dairy company using sector average data ('default biodiversity footprint') and company specific carbon emission data (right). Results are expressed in PDF.ha.yr, a combined unit which is a multiplication of the Potentially Disappeared Fraction of species, the area and the duration. To facilitate interpretation, the PDF is set to 100% (all biodiversity lost) and a duration of one year to match the reporting period. This results in an impact in ha (size of the area where all species are lost during one year).

The footprint shows that the majority of the biodiversity impact of the dairy company is caused by land use, followed by water use and acidification. The calculations also show the causes behind these drivers of biodiversity loss, like land use for dairy farming and the production of fodder. Even though the accuracy of the footprint may be limited due to a lack of company specific data, it offers valuable information for an investor that wants to address its potential impacts on biodiversity (e.g. through investment criteria and engagement).

tion on water and land use would enable a more accurate calculation of impact on biodiversity and a more accurate steering on biodiversity performance in listed equity.

4.4 Project finance

The biodiversity footprinting requirements regarding project finance are outlined in the table below.

Topic	Requirement
Scopes covered	<p>The biodiversity footprint should cover scope 1, 2 and 3. Including scope 3 is important since many impacts on biodiversity will originate in primary production, like agriculture and mining. The indirect impacts on biodiversity from the production of raw materials purchased, product or service use and the product end-of-life phase are often significant and higher than the direct impact of a company's operations. Assessing the impacts throughout the entire value chain is therefore critical to properly account for impacts and look for actions that can effectively reduce these impacts, like engagement and the use of biodiversity related investment criteria.</p>
Portfolio coverage	<p>In case of an assessment of the biodiversity impact of an investment portfolio, ideally 100% of all project finance is covered. In practice, an assessment of biodiversity impact may also take place to decide on an investment in a specific project.</p>
Attribution	<p>Impacts are attributed to equity investors as 'owners' of the projects. In other words, attribution in this case is the ratio of invested value per project over the total investments in the project.</p>
Data	<p>Within the due diligence and monitoring of a project finance transaction, the availability of project-specific data is generally good. As a result, higher quality data on pressures can be obtained than would be available through generic input/output models, without adding an unrealistic amount of additional work to the process. Therefore, it is proposed that impact data for project finance should not be based on generic input-output models, but on project-specific source data.</p> <p>However, since an impact assessment at the start of a project investment needs to be based on expected/estimated impact data, a combination may be necessary of project-specific source data (like area size and interventions foreseen) and indirect, estimated or averaged data from databases, scientific studies and/or case studies of comparable interventions. The type of data used shall be reported and shall be taken into account in the interpretation of the footprint results.</p>
Reference situation	<p>The avoided negative or positive impact on biodiversity of projects is calculated using a business as usual situation as a reference (the project does not take place). The negative impact of project implementation is calculated using the situation without the activities needed to implement the project (like the use of land and resources) as a reference. See section 3.5.</p>
Absolute vs. relative impact	<p>The methodology results in an absolute impact on biodiversity for each project invested in. The result can be used to decide on the investment, investment criteria, engagement with the project owners and monitoring requirements. The results can also be aggregated as total impact for the project finance portfolio.</p> <p>The absolute impact can also be translated into a relative impact to report the impact on biodiversity per euro invested in projects. This enables a comparison of different projects within project finance and, on a portfolio</p>

	level, a comparison of different asset classes, showing where impact hotspots in an investment portfolio are (most likely to be) located.
Avoided impact	If the investment in a project results in avoided negative impact, this avoided impact can be included in the overall footprint on a portfolio level. For the calculation of avoided impact for green energy projects: see 'Investments in green energy' (section 4.6). Avoided impact should be reported separately from negative impacts and biodiversity positive impacts (see chapter 5).
Other considerations	<p>In case of an earmarked impact investment in an intervention/project with the aim to avoid negative impact, it shall be clear how the investment intends to deliver the avoided impact, the investment shall be earmarked exclusively to the intervention which is expected to lead to this avoided impact and there shall be a mechanism in place for verifying that the capital invested has been used for the intervention and that the intervention has taken place.</p> <p>Certification standards can play an important role in projects which intend to deliver a positive outcome for biodiversity (either a positive impact or avoided negative impact). Under certain conditions, the use of biodiversity-relevant sustainability standards (e.g. an investment in a paper company is only made when the wood used is FSC certified) may be rewarded by using an impact correction factor for the certified resource until more accurate data are available. The decision to reward a standard/certification with an impact correction factor will be made on a case-by-case basis. In case such impact correction factors are used, this is reported explicitly. See section 3.7.3 for more information.</p>
Limitations	At the time of the investment in a project, the actual impact on biodiversity has yet to take place. This means that an expected/estimated impact is calculated. When monitoring of the impact following the investment shows that the actual impact is significantly different from the expected/estimated impact, these differences shall be analysed and processed (e.g. to adjust the footprint score and/or to revise engagement activities or monitoring requirements).

4.5 Mortgages

The biodiversity footprinting requirements regarding mortgages are outlined in the table below.

Topic	Requirements
Scopes covered	The biodiversity footprint should cover scope 1 and scope 2, including land occupation and energy use resulting from having a house occupied. Impacts related to the construction of the housing should not be included, since this would lead to double counting with investments in construction.
Portfolio coverage	Ideally, 100% of the mortgage portfolio should be covered. If this is not feasible, at least the majority of the portfolio should be covered and an indication should be provided for a pathway to full coverage.
Attribution mortgage.	100% of the building is attributed, even if a lower share is covered by the Use of the loan-to-value (LTV) ratio (the amount of the mortgage loan divided by the appraised value of the property, expressed as a percentage) for attribution purposes is not advised, because it leads to emissions fluc-

	tuating with property value. Each year a mortgage is continued, the land occupied and energy used is attributed to the mortgage.
Data	<p>Actual data on the energy consumption of the properties should be used, if available. For the Netherlands, PCAF are in contact with Netbeheer Nederland to provide actual energy consumption data.</p> <p>An alternative approach is to use the average use of electricity and natural gas of the energy labels of the housing for which the mortgages are provided.</p> <p>Actual data on the land use of the properties should be used, if available. If such data are not available, the average land use of housing in the country or region considered can be used. This average land use should at least include the housing itself. If data are not available in such detail, the land use can also include the garden, communal spaces and roads. The latter would be based on the average number of houses per hectare in suburban areas.</p>
Reference situation	The reference situation in case of mortgages is the situation in which the land occupation and energy use resulting from having a house occupied would not have taken place.
Absolute vs. relative emissions	<p>The methodology results in absolute land use and emissions per household, which can be aggregated as total impact for the mortgages portfolio. This information can be translated into a relative impact to report the impact on biodiversity per euro invested in mortgages. The latter enables a comparison of relative impact between different asset classes, showing where impact hotspots in an investment portfolio are (likely to be) located.</p>
Avoided emissions	A mortgage on a house that is climate-positive, i.e. generating more energy than it consumes, can be seen as avoided greenhouse gas emissions. Such avoided emissions, reducing one of the drivers of biodiversity loss, can be included in the calculation of the biodiversity footprint of the mortgage.
Other considerations	Land transformation that may have occurred before construction of the housing does not have to be taken into account, since information on this transformation, including the biodiversity value of the land before transformation, will often not be available.
Limitations	No specific limitations, other than limitations resulting from the quality of the data used.

4.6 Investments in green energy

Investments in green energy may overlap with project finance and indirect investments. The biodiversity footprinting requirements regarding investments in green energy are outlined in the table below.

Topic	Requirements
Scopes covered	The biodiversity footprint should cover scope 1, 2 and 3, including the use phase.
Portfolio coverage	Ideally, 100% of the green energy portfolio should be covered. If this is not feasible, at least the majority of the portfolio should be covered and an indication should be provided for a pathway to full coverage.

<p>Attribution</p>	<p>Impacts are attributed to investors as 'owners' of the green energy projects. In other words, attribution in this case is the ratio of invested value per project over the total investments in the project.</p>
<p>Data</p>	<p>Data should be transparent, consistent, fit for purpose and as much as possible broadly accepted by the scientific community. Since an impact assessment at the start of a project investment needs to be based on expected/estimated impact data, a combination may be necessary of actual, direct data provided by projects (like electricity production data) and indirect, estimated or averaged data from databases, scientific studies and/or case studies of comparable interventions. Ideally project specific electricity production data will be used. The type of data used shall be reported explicitly and shall be taken into account in the interpretation of the footprint results.</p>
<p>Reference situation</p>	<p>The avoided negative impact of investments in green energy is calculated using a business as usual situation (the production and use of 'grey' energy from the grid) as a reference. The negative impact of the production of green energy (like material use for the production of wind mills and solar panels) is calculated using the situation without these activities as a reference. Positive and negative impacts which cannot yet be quantified, like the creation of new habitats by off-shore wind mills and impacts of wind mills on birds and bats shall be included in the qualitative analysis.</p>
<p>Absolute vs. relative emissions</p>	<p>The methodology results in an absolute impact on biodiversity for each project invested in. The result can be used to decide on the investment, investment criteria, engagement with the project owners and monitoring requirements. The results can also be aggregated as total impact for the green energy portfolio.</p> <p>The absolute impact can also be translated into a relative impact to report the impact on biodiversity per euro invested in green energy projects. This enables a comparison of different green energy projects. On a portfolio level, a comparison can be made of different asset classes, showing where impact hotspots in an investment portfolio are (most likely to be) located.</p>
<p>Avoided emissions</p>	<p>Investments in renewable energy can take into account the avoided electricity production from grey electricity sources, as renewable energy replaces grey electricity from the grid. This can be done using the average grid mix from the country where the renewable energy is produced. Since the share of renewables in the electricity mixes worldwide is growing, the avoided emissions will decrease over time.</p> <p>The avoided impact can be included in the overall footprint on a portfolio level. This avoided impact should be reported separately from negative impacts and biodiversity positive impacts (see chapter 4).</p>
<p>Other considerations</p>	<p>For investments in renewable energy funds with multiple projects across different countries, the impact can be calculated based on the technological spread (wind, solar, hydro) and the regional spread of the fund.</p>
<p>Limitations</p>	<p>The assumption that renewable energy replaces grey electricity from the grid (see 'reference situation') will not always reflect reality. However, investments in renewable energy should be rewarded in a biodiversity footprint, since climate change is one of the main drivers for biodiversity loss. For this reason, technologies that facilitate low-carbon electricity production will contribute to a reduction of further biodiversity loss.</p>

CASE STUDY: BIODIVERSITY FOOTPRINT FOR INVESTMENTS IN RENEWABLE ENERGY

Climate change is one of the main drivers for biodiversity loss and the use of fossil fuels for energy is a key source of GHG emissions contributing to climate change. Investments in green electricity can contribute to a reduction of this pressure on biodiversity. The following case study illustrates a biodiversity footprint calculation for a solar PV project using the BFFI methodology.

Solar PV energy projects

When calculating the impact from solar energy projects, the first step is to translate the investment in euro, into the annual production of energy in MJ (or kWh). First, the expected installed capacity from an investment in wind energy is calculated. To do so, the expected installed capacity from an investment in solar energy is calculated. This is done by multiplying the value of the investment by the investment costs in euro per kW. These costs differ per country (and project). Unless project specific values for installed capacity, or annual electricity production data are available, data on an “average” solar energy project in a country can be used.

For the calculation of all inputs and emissions of the supply chain, construction, maintenance and operation of solar PV projects, the ‘Production of electricity by solar photovoltaic’ from the corresponding country in EXIOBASE was used. In order to incorporate the benefits of renewable energy compared to the current electricity mix, the avoided emissions were calculated using the EXIOBASE dataset ‘Electricity Mix’ for the corresponding country. It is assumed that the

energy produced will displace the average grid mix electricity in that country. The ‘avoided’ impacts were subtracted from the negative impacts of producing solar energy.

The assumption that solar energy replaces a national grid mix is compatible with the PBAF guidelines, but is in fact a conservative way to calculate this. When we look what actually happens in the energy market we will see that if more solar or wind energy enters the grid, the market will switch off those energy generation plants that have the highest marginal costs. Hydropower and nuclear energy plants are characterized by high investment costs and very low operating costs, so these will almost never be switched off. Fossil energy plants have relatively low investment, but high operating costs because they use much fuel. It is therefore much more logical that these will be switched off first, and thus one can safely assume that solar and wind energy replaces

fossil fuel based power generation. This also applies in a country like France, that hardly has any fossil fuel based electricity production. France is a relatively high exporter of electricity in Europe (because of the low costs of nuclear energy), so a surplus production will lead to a reduction of fossil fuel in other countries.

The following chart shows the biodiversity impact of solar PV projects in the Netherlands, Belgium, and France. The benefit of renewable energy sources is highest in countries with a carbon intensive energy mix, as the production of renewable energy will replace the average grid mix. In France we find that the grid mix has a relatively low carbon intensity due to the high share of nuclear energy in the French grid mix, which causes significantly less climate change than other fossil energy sources. The results are expressed in hectares where all biodiversity is lost during one year. This unit is

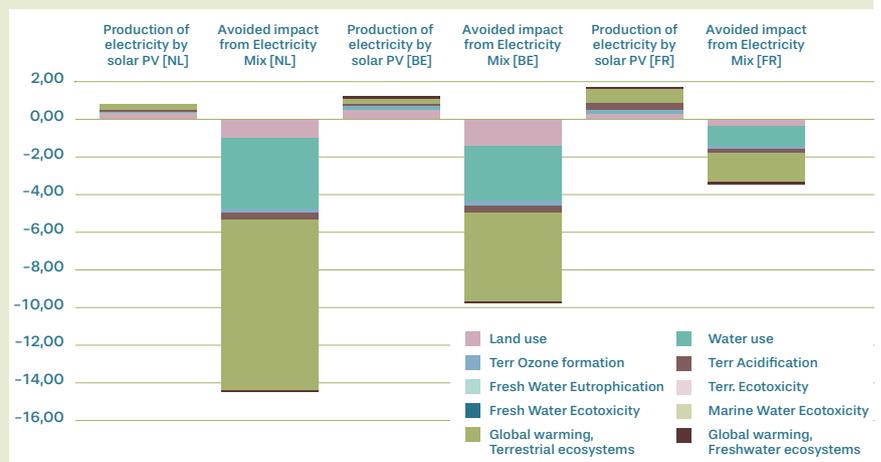


Figure 5: Biodiversity impact from investing 1MEUR in Solar PV in The Netherlands, Belgium and France. The chart shows the biodiversity loss from PV production and the avoided impact from the grey electricity mix in PDF.ha.yr (expressed in Ha where all biodiversity is lost during one year)

derived from the PDF.m2.yr unit from the ReCiPe pressure-impact model. This unit is a multiplication of the potential disappeared fraction of species (PDF), the area where they are lost and the duration of the loss. For simplicity the disappeared fraction is set to 100% and since the reporting period is one year, the duration time is fixed to 1 year. This allows us to report in hectares where all biodiversity is lost during one year. Note that a negative value is in fact a negative loss of biodiversity and therefore positive.

In the case study, the negative impact on biodiversity from an

investment of 1 million euro in solar PV varies between 1 and 2 ha, depending on the country. The avoided negative impact from solar energy compared to the grid mix (the ‘business as usual’ situation) varies between -3 and -15 ha. The main drivers of negative impact are climate change, land use and water use. Other drivers such as eutrophication, acidification and ecotoxicity are less important in this case study.

N.B.: it must be realized that not all impacts of investments in green energy can be captured by the ReCiPe model. For example, negative impacts of windmills on birds

and bats are not included in the ReCiPe methodology. The same is true for potential positive impacts of offshore wind parks (like the creation of artificial reefs). This is the reason why the quantitative analysis is accompanied by a qualitative analysis. This qualitative analysis provides input for a correct interpretation of the results and for biodiversity relevant investment criteria (e.g. no investments in wind parks close to bird migrating routes) or engagement with investees.

4.7 Indirect investments, e.g. in green bonds and investment funds

The biodiversity footprinting requirements regarding indirect investments are outlined in the table below.

Topic	Requirements
Scopes covered	Regardless of the nature of the underlying assets of the indirect investments, the biodiversity footprint should cover scope 1, 2 and 3.
Portfolio coverage	<p>Ideally, 100% of the indirect investments should be covered. If this is not feasible, at least the majority of the portfolio should be covered and an indication should be provided for a pathway to full coverage.</p> <p>Examples of indirect investments include:</p> <ul style="list-style-type: none"> ● Equity vehicles, like investment funds (including ETFs and fund of funds) in public and private markets. ● Bond vehicles, like green bonds, covered bonds and asset-backed securities. ● Derivatives, like FX forwards, IRS, Options, Futures, CDS ● Collateral, like pledged for derivatives (cleared and OTC), securities lending, or reinsurance.
Attribution	<p>Attribution is based on the PCAF approach: The attributed impacts of the underlying assets for indirect investments should be aggregated and calculated according to the methodology for each specific asset class, such as sovereign bonds, listed equities or mortgage loans. Cash holdings are considered as having zero emissions.</p> <p>Impacts of the underlying assets in an indirect investment are proportionally attributed to the investor's share in the total vehicle</p> <p>The approach for the most common used derivatives by financial institutions is the following:</p>

	<ul style="list-style-type: none"> ● FX forwards: indirect exposure to cash, so no impacts ● Interest rate swaps: indirect exposure to cash, so no impacts ● Options: impacts of the underlying assets are proportionally attributed using the market value of the option ● Futures: not decided yet ● Credit Default Swaps: impacts of the underlying assets are proportionally attributed using the market value <p>As pledged collateral is typically not owned, no impacts are attributed. We promote as best practice to (1) restrict acceptable collateral with additional guidelines in line with the SRI policy of the financial institution, and (2) attribute the impact of the collateral for informational purposes.</p>
Data	<p>The first and most reliable source for the emissions of an indirect investment should be the asset manager or issuer, following the existing PBAF guidelines and independently verified. Investors should engage with these asset managers and issuers to disclose the attributable impacts of these indirect investments.</p> <p>If not provided, impact data could be made available by other providers, like public data sources or designated data vendors. Investors could engage with data vendors to provide these data. Finally, the investor could assess the indirect investment impacts by capturing the underlying portfolio (look through) and calculating the pro rata impacts with his own PBAF models and data sources.</p> <p>Investors should engage with asset managers and issuers to fully disclose the holdings of their investment funds. This approach is only realistic for underlying assets in public markets.</p>
Reference situation	<p>The choice of the reference situation in case of indirect investments depends on the underlying assets. See also the choice of reference situation for the other asset classes discussed.</p>
Absolute vs. relative emissions	<p>The methodology results in an absolute impact on biodiversity for indirect investments. The result can be used to decide on the investment, investment criteria, engagement with the asset manager or issuer and monitoring requirements.</p> <p>The absolute impact can be translated into a relative impact to report the impact on biodiversity per euro invested in indirect investments. This enables a comparison of different indirect investments. On a portfolio level, a comparison can be made of different asset classes, showing where impact hotspots in an investment portfolio are (most likely to be) located.</p>
Avoided impact	<p>If indirect investments result in avoided negative impact (e.g. in case of green bonds), this avoided impact can be included in the overall footprint on a portfolio level. This avoided impact should be reported separately from negative impacts and biodiversity positive impacts (see chapter 4).</p>
Other considerations	<p>See 'project finance' (section 4.4) for considerations regarding the reference situation in case of impact investments and the role of certification standards in projects.</p> <p>See 'investments in green energy' for considerations regarding green energy bonds.</p>
Limitations	<p>See 'project finance' (section 4.2) and 'investments in green energy' (section 4.6) for limitations regarding footprint calculations for projects and investments in green energy. General limitations in case of indirect investments (also mentioned in PCAF):</p>

- Not all providers of indirect investments disclose biodiversity impacts according to the PBAF methodology.
- Not all providers of indirect investments disclose the relevant biodiversity impacts for investors.
- Not all providers of indirect investments disclose their full underlying portfolio, so investors cannot calculate the impacts themselves.
- Indirect investments may have an international universe and part of that can be in private markets. It will be challenging (or impossible) for the investor to make the PBAF calculation with a look through approach, because of the required biodiversity impact data for the underlying assets.



5 Disclosure of the impact on biodiversity

5.1 Disclosure of the impact assessment / footprint

A financial institution may decide to disclose the results of a biodiversity footprint in an annual (sustainability) report. In order to be transparent about the biodiversity footprint of an investment portfolio, the report shall differentiate between positive impacts, avoided negative impacts and negative impacts.

Reporting on the drivers behind the impacts on biodiversity allows a financial institution to link the results to other policies and objectives the financial institution has in place, like policies and objectives on climate change, water use, land use, deforestation, etc.

5.2 Reporting on a no-net-loss or net-gain

Financial institutions aiming for a no net loss or net gain of biodiversity must be aware of and take into account two important considerations:

1. For many stakeholders, a no-net-loss implies a strategy which meets the requirements of initiatives like the Business and Biodiversity Offsets Programme (BBOP). This includes, for example, 'like-for-like' compensation: the biodiversity gains should be comparable (in ecological terms, from a conservation-priority perspective, and to local stakeholders) to the losses occurred. Since this is not realistic on a portfolio level due to a lack of detailed and location specific footprint data, a financial institution with a no-net-loss or net-gain objective on a portfolio level needs to explain how this objective is interpreted.
2. To reach a no-net-loss or net-gain on a portfolio level, financial institutions will be inclined to use investments in positive impact and avoided negative impact to 'balance out' negative impacts. However, the strategy of reaching a no-net-loss or a net-gain always needs be based on the '*mitigation hierarchy*' (see figure 6): ways to avoid, minimize or restore a negative impact need to be explored first before compensation of residual impacts is considered.

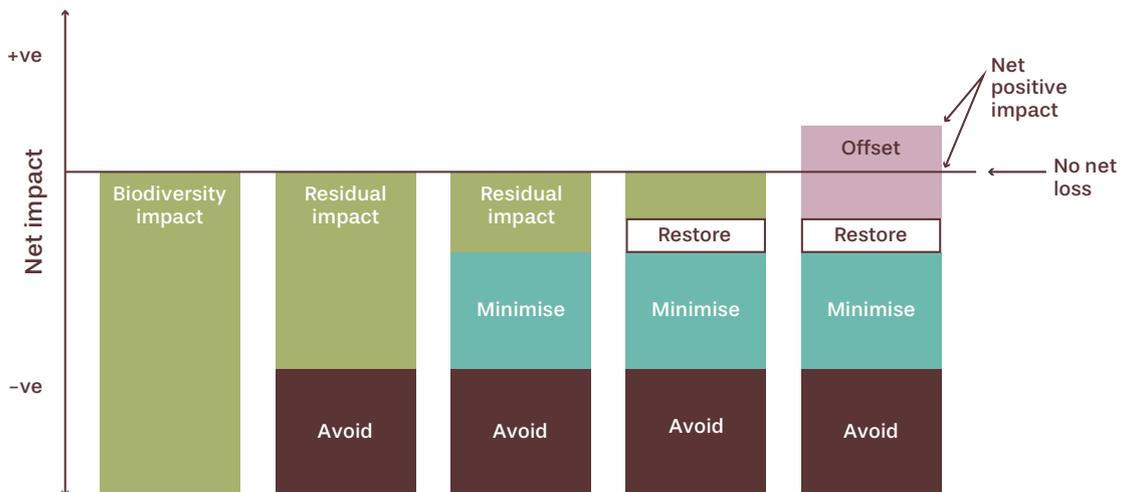


Figure 6: The mitigation hierarchy (source: The Biodiversity Consultancy)

6 Next steps

This common ground paper is written in a period when the number of biodiversity related initiatives by financial institutions and companies is rapidly growing, a revision of the biodiversity objectives on a global and European level is underway and science based targets are being developed. It is expected that these international developments will find their way into biodiversity impact assessment, the interpretation of footprint results and the focus of investments on the conservation and sustainable use of biodiversity, potentially also covering the linkages between biodiversity, ecosystem services and beneficiaries.

In other words, the principles included in this paper will be subject to change and regular updates. The need for such updates will therefore be actively monitored and discussed by the PBAF partners.

A platform for sharing experiences and discussion

This common ground paper has been developed by a select group of Dutch financial institutions interested in the assessment of biodiversity impacts of their investments in order to contribute to the conservation and sustainable use of biodiversity. An important next step will be to turn the Partnership for Biodiversity Accounting Financials into an international platform where a wider group of financial institutions can discuss the opportunities and challenges surrounding biodiversity footprinting, discuss methodological issues and the use of footprinting results and update the principles in this common ground paper on a regular basis. Not with the objective to develop one footprinting methodology or one impact metric, but with the objective *to strengthen the (potential) role of biodiversity footprinting in the financial sector as a means to contribute to local, national and international biodiversity targets.*

We invite financial institutions to join the PBAF initiative in reaching this objective.

Steps foreseen for 2021

Under the chairmanship of ASN Bank, the following next steps are foreseen for the partnership in 2021, besides the creation of the PBAF-platform and a continued exchange of experiences between the PBAF partners:

- Aligning the PBAF footprinting principles with (new developments regarding) the Product Environmental Footprint, The EU Taxonomy and The Taskforce Nature Related Financial Disclosure (TNFD).
- Exploring the potential value of expanding the principles on biodiversity impact assessment with principles on the assessment of dependencies on biodiversity and ecosystem services.
- Exploring the ways in which Science Based Targets (SBTs) might influence biodiversity footprinting and how SBTs could be used in the interpretation of footprinting results
- Identifying ways in which the relations between biodiversity, ecosystem services and beneficiaries can feed into biodiversity footprinting and/or build on biodiversity footprinting results.

7 Glossary

Negative impact	A negative impact means a (potential) loss of biodiversity resulting from interventions (like economic activities) compared to a reference situation. A negative impact may be the result of a direct negative impact of the activity itself and/or an indirect negative impact taking place in the supply chains and use phase of a product/service.
Avoided negative impact	The avoidance of negative impact on biodiversity refers to the reduction or prevention of negative impacts resulting from an intervention/economic activity by means of, for example, better management practices or the replacement of raw materials with a high impact on biodiversity with raw materials with a lower impact on biodiversity. The avoided negative impacts can refer to existing impacts, but can also relate to future, expected impacts. An example of the latter is the production of non-timber forest products which may prevent (future) deforestation by creating value for a forest.
Positive impact	A positive impact means a (potential) gain in biodiversity resulting from interventions (like economic activities) compared to a reference situation. A positive impact may be the result of a direct positive impact of the activity itself and/or an indirect positive impact taking place in the supply chains and use phase of a product/service.
Reference situation	The situation which is used as the baseline against which the impact of an investment is assessed.
Absolute impact	Impact attributed to an investment or investor. The term 'absolute impact' is also used to indicate the calculation of negative impact of an activity, using the situation in which the activity does not take place as a baseline.
Relative impact: per invested value	Impact attributed to an investor (absolute impact) normalised for the sum invested. Expressed in, for example, PDF.m ² .yr / M€ invested, m ² /M€. The term 'relative impact' is also used to indicate the calculation of avoided or positive impact, using the 'business as usual' situation as a baseline.
Metric	A unit of measurement capturing changes in biodiversity.
PDF	Potentially disappeared fraction of species, a metric used to assess the potential decline in species richness in an area over a time period. Larger PDF values indicate a higher level of impact for the activity
MSA	Means Species Abundance, a metric used to measure biodiversity intactness or the remaining level of biodiversity in an impact area. MSA offers a value from 0 (completely destroyed ecosystem with no original species) to 1 (species abundance is unchanged).
Sovereign bond	A debt security issued by a government to support government spending.
Project finance	The financing of infrastructure projects, industrial projects and other projects, like ecotourism, species protection, etc.
Investments in green energy	Investments in the production of energy from sustainable (green) resources, like wind energy and solar energy, resulting in avoided greenhouse gas emissions compared to the production of fossil-based energy.
Indirect investments	Indirect investments are characterised by having an investment exposure through a 'vehicle', ideally with a look through for the underlying or ring-fenced assets where the financial institution is ultimately invested in.

	The exposure can consist of a single asset, a local or international universe, and listed as well as private markets.
Mortgages	A mortgage is a debt instrument, secured by the collateral of specified real estate property, that the borrower is obliged to pay back with a predetermined set of payments.
Listed equity	Equity is typically referred to as shareholder equity, which represents the amount of money that would be returned to a company's shareholders if all of the assets were liquidated and all of the company's debt was paid off.
Investment	The term 'investment' (unless explicitly stated otherwise) is used in the broad sense: 'putting money into activities or organisations' with the expectation of making a profit'. This in contradiction to the more narrow definition sometimes used within for example a bank: as one of several financing options, besides e.g. debt finance, equity finance. Most forms of investment involve some form of risk taking, such as investment in equities, debt, property, projects, and even fixed interest securities which are subject to inflation risk, amongst other risks.

Annex 1

Finance for biodiversity pledge

We, X financial institutions, representing over EURO X trillion in assets, ask global leaders during the 15th meeting of the Conference of the Parties (COP 15) to the Convention on Biological Diversity (CBD) to agree on effective measures to reverse nature loss in this decade to ensure ecosystem resilience.

As financial institutions we know that healthy societies, resilient economies and thriving businesses rely on nature. Together let's protect, restore and sustainably use our natural resources. We will make every effort to take our share of responsibility and contribute to the protection and restoration of biodiversity and ecosystems via our financing activities and investments.

We therefore commit to do the following by 2024 at the latest:

Collaboration and knowledge sharing

We will collaborate and share knowledge on assessment methodologies, biodiversity-related metrics, targets and financing approaches for positive impact.

Engaging with companies

We will incorporate criteria for biodiversity in our ESG policies, while engaging with companies to reduce their negative and increase positive impact on biodiversity.

Assessing impact

We will assess our financing activities and investments for significant positive and negative impact on biodiversity and identify drivers of its loss.

Setting targets

We will set and disclose targets based on the best available science to increase significant positive and reduce significant negative impact on biodiversity.

Reporting publicly

We will report annually and be transparent about the positive and negative contribution to global biodiversity goals linked to our financing activities and investments in our portfolios.