



Platform voor
Duurzame
Financiering

Biodiversity Opportunities and Risks for the Financial Sector

The Sustainable Finance Platform

Working Group Biodiversity
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The Sustainable Finance Platform

This report is a reflection of the deliberations of the Biodiversity Working Group set up under the auspices of the Sustainable Finance Platform. The working group consists of Actiam, APG, ASN Bank, a.s.r., FMO, Rabobank, Robeco, Ministry of Agriculture, Nature and Food Quality, Erasmus University Rotterdam and is sponsored by NWB Bank.

The Sustainable Finance Platform is a cooperative venture of De Nederlandsche Bank (chair), the Dutch Banking Association, the Dutch Association of Insurers, the Federation of the Dutch Pension Funds, the Dutch Fund and Asset Management Association, Invest-NL, the Netherlands Authority for the Financial Markets, the Ministry of Finance, the Ministry of Economic Affairs and Climate, and the Sustainable Finance Lab. Platform members meet twice a year to forge cross-sectoral links, to find ways to prevent or overcome obstacles to sustainable funding and to encourage sustainability by working together on specific topics.

The Sustainable Finance Platform fully supports this paper. However, the practices and advice described herein are in no way binding for the individual financial institutions comprising the industry organizations which are members of the Platform, nor are they committed to take any specific follow-up actions. Furthermore, this paper outlines private sector initiatives and as such does not contain any supervisory requirements.

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Executive Summary

The Value of Biodiversity

From the functioning of our society and economy, down to our health and safety, biodiversity affects our lives in a multitude of different ways. As an example 75% of the global food crop types, which include the most important fruit and vegetables species along with plants such as coffee and cocoa, rely on animals for their pollination (Díaz et al., 2019). Together, these crops have an economic value between USD 235 – 577 billion (OECD, 2019). Furthermore, marine and terrestrial biota are significant carbon sinks and are able to sequester 60% of global emissions, thereby playing a critical role in mitigating climate change (Díaz et al., 2019). But many more commodities and economic sectors directly or indirectly depend on the variety of plants, animals and insects in the world. In order to guarantee the stability of our society and economy today, but also for future generations, it is important that we conserve biodiversity.

Biodiversity Loss

According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the world's most comprehensive biodiversity monitor, we have significantly altered 75% of the earth's land surface (Díaz et al., 2019). As clearly illustrated by the concept of the planetary boundaries and by resilience theory, we are approaching a global biodiversity threshold which, if crossed, can lead to a significant, possibly irreversible, decrease in global biodiversity and to large-scale economic and social costs. Our major terrestrial biomes have already seen a decline of 20% in the number of their native species. Another 25% of global species of animals and plants are threatened and up to 1 million species can face extinction if urgent action on biodiversity is not taken. Due to our actions, we are currently experiencing an extinction rate estimated at being 1000 times higher than the background (pre-human) rate. Thereby threatening to induce our planet's sixth mass extinction (Díaz et al., 2019).

Risk, Return and Impact for Financial Institutions

Financial institutions have an impact on biodiversity. The majority of this impact is not through our own operations, but rather through our investments, insurance and loans to companies and households (Natural Capital Coalition, 2018; Mulder & Koellner, 2011). Especially investments in companies with a high exposure to biodiversity throughout their supply chain might pose a risk to a financial institution (Natural Capital Coalition, 2018; Mulder & Koellner, 2011).

To put the urgency in perspective, it was calculated that the long run economic damages of greenhouse gas emissions, based on 2008 figures, would be around USD 1.7 trillion per year. Those from biodiversity loss are estimated to range between USD 2-4.5 trillion per year. This comparison provides a clear message that both phenomena are equally urgent, also for financial institutions, and require immediate action (Evison & Knight, 2010). These damages however, do not necessarily have to materialize. Sustainable and biodiversity positive business models provide opportunities for business. It is expected to lead to longer-term viability of business models, increased market share, new business models and better relationships with stakeholders (OECD, 2019).

The financial sector can play an important role to realize these opportunities and halt the global loss of biodiversity. For example, it was estimated by the Convention on Biological Diversity (CBD) that a per annum global investment of USD 150 – 440 billion is needed in order to achieve the goals set within the 2020 Aichi Targets (Bor, Müller, & Duke, 2018) and realize the opportunities as indicated above. These 20 targets, created in 2010 and signed by 194 countries, have the purpose of aligning the global community in the fight against biodiversity loss. By altering our investments towards more sustainable uses of biodiversity, we can help to reach this goal.

Next Steps

There are already many examples showing what we can do to manage our impact on biodiversity. This report gives examples why biodiversity is relevant for financial institutions and what we can do to integrate it in our financial decision-making. The report also includes examples of best practices from various institutions in the Dutch financial sector that together form the working group. As a first follow-up, an explorative paper on deforestation monitoring and management tools will be published.

Foreword

The year 2020 marks the end of the United Nations Decade on Biodiversity. Over the last decade, all kinds of parties have been working on the implementation of the Strategic Plan for Biodiversity and to promote its overall vision of living in harmony with nature. Yet, according to the 2019 IPBES report *Global assessment of biodiversity and ecosystem services*, nature is still declining at rates unprecedented in human history. It therefore became even clearer that there is still a lot of work to do. Fortunately, awareness is growing. "For the first time in the history of the Global Risks Perception Survey, environmental concerns dominate the top long-term risks by likelihood among members of the World Economic Forum's multistakeholder community", according to the executive summary of the Forum's 2020 Global Risks Report. Furthermore, I'd like to refer to the initiative of 'The Deltaplan for Biodiversity recovery' (December 2018) in our own country.

The financial sector is experiencing a growing sense of urgency that it needs to contribute to biodiversity preservation and restoration. Not only because further loss of biodiversity is a material risk for financial institutions, but even more so because we are becoming more and more aware of our own impact on biodiversity, both positive and negative. To further increase the awareness of risks and opportunities of biodiversity and to share the already many initiatives within the Dutch financial sector, a special working group has been established under the umbrella of the DNB Sustainable Finance Platform.

I am very honored to have been asked to chair this working group. It has been a pleasure to work together with a motivated group of colleagues coming from all angles of the Dutch financial sector. In addition, we had great support from representatives of the Ministry of Agriculture, Nature and Food Quality and the Erasmus University. I especially want to thank Wouter van Ingen, master student at the Erasmus University Rotterdam (Platform for Sustainable Value Creation) for his research and the preparation of this paper. It is truly encouraging to see that there are already many examples of financial institutions that have implemented biodiversity into their daily business practices. They are willing to share their knowledge and experience in this paper called 'Biodiversity; Opportunities and risks for the financial Sector'.

Let this paper be a first step towards making biodiversity as much a common feature within the financial sector as climate. I would like to thank all that have contributed to this paper and look forward to presenting many more inspiring products.

Warm regards,

Lidwin van Velden

Sponsor of the Working Group Biodiversity and chair of the Managing Board of NWB Bank

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Introduction

By 2020, the world is supposed to achieve the Aichi Biodiversity Targets, and a zero draft for post-2020 targets has already been set-up (Convention on Biological Diversity, 2020). The 20 Aichi targets, created in 2010 and signed by 194 countries, have the purpose of aligning the global community in the fight against biodiversity loss. The first target states that people have to be “aware of the value of biodiversity and the steps they can take to conserve and use it sustainably” (Convention on Biological Diversity, 2018). This paper aims to increase awareness of biodiversity amongst financial institutions, thereby contributing to achieving the Aichi targets

Based on 2010 figures, it was calculated that USD 51 – 53 billion per annum was spent globally on funding biodiversity and ecosystem services. However, according to the Convention on Biological Diversity (CBD), a global investment of USD 150 – 440 billion per annum is needed in order to achieve the Aichi Targets (Bor, Müller, & Duke, 2018). This significant financing gap highlights an underdeveloped understanding of the materiality of biodiversity and its subsequent loss for financial institutions. While biodiversity might only seem relevant to actors that rely on it in their supply chain, financial institutions need to better realize that continued biodiversity loss will affect everyone. The latest Global Risk Report of the World Economic Forum concluded that biodiversity loss and ecosystem collapse are within the top three global risks based on impact and likelihood of occurring. It presents a greater threat than for example interstate conflict (World Economic Forum, 2020).

This paper aims to convey the importance of biodiversity and its effects on the security of financial institutions and the economy. With global biodiversity reaching a critical tipping point, it is important that financial institutions realize how their investments both directly and indirectly impact biodiversity. Next to highlighting the material risks of biodiversity loss, we also aim to provide inspirational case studies that show that people, planet and profit can work in tandem and create positive biodiversity outcomes. Furthermore, by providing case studies of the members of our working group, we want to give readers insight into how leading financial institutions in the Netherlands are managing biodiversity into their day-to-day activities. If we work together and learn from each other, the financial sector can become an even larger driving force in securing a planet that can be enjoyed for generations to come. Join us!

1 The Value of Biodiversity

Biodiversity and ecosystem services (see glossary for definitions) are vital for life on earth. They influence the functioning of our society and economy, down to our health and safety. Importantly, natural capital, ecosystems, biodiversity and their services are all interrelated and connected. As visualized by the figure below, biodiversity creates flows of ecosystem services, which benefit and create value for business and society, through which financial institutions are ultimately influenced – although the latter is not explicitly illustrated below. Strikingly, it was estimated by the OECD that ecosystem services provide societal benefits worth USD 125 – 140 trillion per year¹. To put this into perspective, this value represents roughly one and a half times global GDP (OECD, 2019).



Figure 1: Biodiversity and natural capital stocks, flows and value (Natural Capital Protocol, 2016)

To comprehend the importance and value of biodiversity in our everyday lives, further examples are illustrated below. It has to be noted that the following global monetary values and approximations are estimates and therefore need to be interpreted as an indication of their importance instead of their definite values. Case studies, both on a national and local level, are considered more accurate than global estimates and have also been included. While the following examples only provide a glimpse of the various ways biodiversity impacts us, it does highlight the many different sectors it creates value for.

1.1 Examples on the Importance of Biodiversity

- 75% of the global food crop types, which include the most important fruit and vegetables species along with plants such as coffee and cocoa, rely on animals for their pollination (Díaz et al., 2019). The annual crop yields that depend on pollination together have an economic value between USD 235 - 577 billion (OECD, 2019). As a case study, agricultural production in Switzerland, due to bee pollination alone, was valued at USD 213 million between 1997 and 2006 (Besser, 2010).
- Roughly one gram of soil may typically contain one billion bacterial cells (corresponding to about ten thousand different bacterial genomes), up to one million individual fungi, about one million cells of protists, and several hundred types of nematodes. This soil biodiversity, which also includes organisms such as worms and moles, provide a plethora of ecosystem services. Soil biodiversity drives, amongst others, nutrient cycling, maintaining soil structure and aids in the detoxification of xenobiotics and pollutants. Together, it has

¹ Please note that monetized impacts mentioned throughout the report might be based on different scoping and monetization principles. Therefore, please refer to the sources of the respective figures to assess comparability of figures.

been estimated that the value of soil biodiversity, and their resulting ecosystem services, range between 1.5-13 trillion US dollars (Data European Soil Centre, n.d.).

- It has been estimated that four billion people rely on natural medicine to stay healthy and that roughly 70% of cancer drugs are based on compounds found in nature (Díaz et al., 2019). An example of the medicinal value of biodiversity is found in Lipitor. Being the most profitable drug to date, Lipitor, a cardiovascular drug based on a microbial natural product, had annual sales of USD 12-14 billion per year from 2004 -2014 (OECD, 2019). However, deterioration of biodiversity and ecosystem services can also have a direct and indirect negative impact on public health. Land clearing and habitat fragmentation can lead to the emergence of zoonotic diseases as animals are forced to live in closer contact with human beings. Zoonotic diseases are transmissible from animals to humans and they make up 17% of all infectious diseases worldwide (Díaz et al., 2019). Another example is the impact of infectious diseases linked to the illegal wildlife trade which made its impact on the global economy (Singh Khadka, 2020).
- Marine and terrestrial biota are significant carbon sinks and are able to sequester 60% of global emissions, thereby playing a critical role in mitigating climate change (Díaz et al., 2019). For example, microscopic marine algae sequesters roughly 40% of all the carbon dioxide in the atmosphere. To put this into perspective, the sequestration ability of phytoplankton in the ocean is equivalent to a tropical rainforest roughly four times the size of the Amazon rainforest. Even a 1% increase in the activity of phytoplankton would be like instantly planting two billion mature trees, these are considered nature based solutions. Interestingly, whales have a strong positive influence on algae populations. Through their excrements, whales provide rich growing conditions for algae populations to blossom. As a result, whales can play an important role in curbing climate change by stimulating algae growth in the oceans. As a result, through their provision of ecosystem services and their value for tourism, a whale is estimated to be worth above USD 2 million, with the global whale population thereby having a valuation of over USD 1 trillion (Bijlo, 2020).
- Natural structures such as forests, coral reefs, wetlands and dunes reduce the impact of natural hazards such as hurricanes and floods (Becker, 2010). For example, wetlands prevented USD 650 million worth of damages during the 2012 Superstorm Sandy (OECD, 2019). In addition, the total costs of hurricane Katrina (USD 150 billion) were significantly higher due to the loss of wetlands (Evison & Knight, 2010). Furthermore, terrestrial and marine biota play an important role in purifying water for drinking purposes. For example, around 60% of the groundwater that is used for drinking water in the Netherlands is purified by ecosystems (de Knecht et al., 2014).
- A high diversity of crop species improves the resilience of crops to pests and pathogens (Díaz et al., 2019). For instance, improving ecosystems and biodiversity within agro-ecosystems attracts insectivorous birds and microbial pathogens which help regulate pests and disease through biological control. As an example, the value of eliminating the soybean aphid through biological control in the US was estimated at USD 239 million between 2007-2008 (OECD, 2019).

2 Why is Biodiversity Relevant for Financial Institutions?

Financial institutions have an impact on biodiversity while they are at the same time exposed to the financial risks associated with biodiversity loss. The majority of a financial institution's impact on biodiversity is not through its own operations, but rather through its investments, insurance and loans to companies and households (Natural Capital Coalition, 2018; Mulder & Koellner, 2011). To put this in perspective, the greenhouse gas emissions induced by the investments and loans of Canadian banks to fossil fuel companies, were 100 times higher than the operational emission from the banks themselves (van Tilburg & Achterberg, 2016). The same reasoning applies to a financial institution's biodiversity footprint. For example, ASN Bank, one of our working group members, is the first bank globally to measure the biodiversity footprint across the full spectrum of its portfolio. Using the 'Biodiversity Footprint for Financial Institutions' (BFFI) framework, ASN Bank calculated that the biodiversity impact of its investments was equivalent to an area of roughly 6,600 km² being completely devoid of biodiversity. To put this into perspective, this land area is about the size of the provinces of North and South Holland combined (6,382 km²). This is not a yearly loss, but rather a one-time loss which can change per year (Lachmeijer, 2018). This shows the disproportionate impact a financial institution may have on biodiversity. It is therefore important to realize what financial risks are associated with biodiversity loss and how they can affect the operations of a financial institution.



Additionally, it is important to note that by working on biodiversity, financial institutions contribute towards SDG's 14 and 15 directly and multiple of other SDG's indirectly. A strategy to reduce biodiversity loss (SDG's 14 and 15), includes a pathway that accounts for sustainable production and consumption of food (SDG 2 and 12), feed, fibers and fuel (SDG 7), along with climate mitigation (SDG 13) - please refer to image 3 below which reflects the opportunity for cross sectoral solutions.

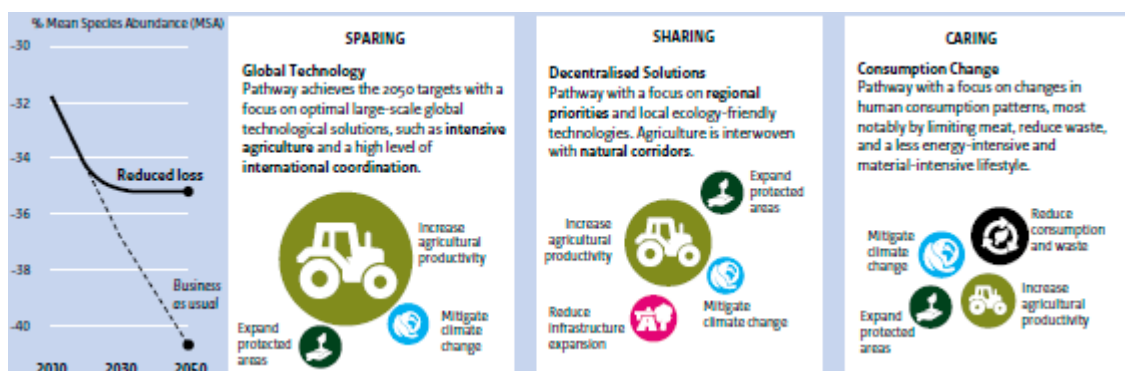
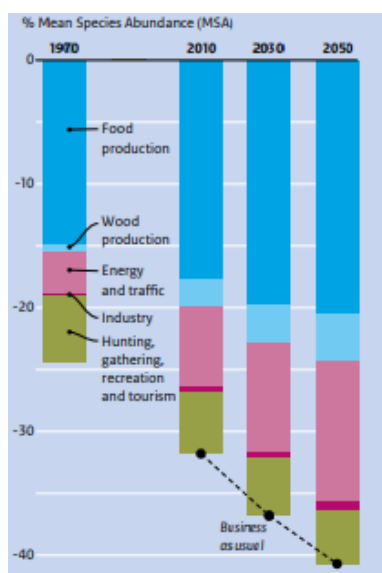


Figure 2: Biodiversity causes and pathways for reducing biodiversity loss (PBL, 2017b)



It should be noted however, that most pressure on biodiversity can be attributed to the production sector. To address and mitigate this pressure, businesses need to become aware of their impact on biodiversity and of the economic risks of losing natural capital and its benefits - please refer to image 4 which reflects the importance of chain responsibility when combating biodiversity loss. Agriculture, infrastructure and mining are some of the industries that impact biodiversity most severely. However, it should be noted that other sectors, such as the retail sector, have embedded impacts.

Figure 3: Biodiversity causes and pathways for reducing biodiversity loss (PBL, 2017b)

2.1 Types of Natural Capital Related Financial Risks

The materiality assessment of risks related to natural capital for financial institutions has improved over the past years, although further research is required. But, as DNB concluded in their report "Values at Risk" (2019) 'while determining the exact impact of biodiversity loss on the solidity of financial institutions remains challenging, specific risk channels are clearly identifiable'. Risk categories can be identified and real life examples have already presented themselves. According to the Sustainable Finance Lab, loss in natural capital and biodiversity results in the following risks for financial institutions (Van Tilburg & Achterberg, 2016 and University of Cambridge Institute for Sustainability Leadership, 2020).

Physical Risks:

Credit and investment risk:

As a result of failing ecosystem services, natural inputs can become inaccessible and therefore lead to production disruptions. This can lead to credit and investment risks for financial institutions and it can lead to business default or poor investment results.

- Example: as a result of local deforestation in the Ango River Basin, the Tana River in the Philippines has experienced such a level of siltation that the 100-megawatt Binga Hydroelectric facility can only operate intermittently (Evison & Knight, 2010).
 - Applies to: asset managers, commercial banks.

Systemic Risks:

Market risk:

Financial institutions can be confronted with a decline in the market value of their investment portfolios if crossing the tipping point of biodiversity leads to large-scale failure of ecosystem services and a resulting loss of production possibilities. As the result of the interconnectedness between such events, and the concentration of particular activities or sectors in certain regions, crossing the tipping point leads to global systemic risks. These interdependencies are difficult to analyze and discover, also because biodiversity and climate risk factors are not yet integrated into day-to-day risk management.

- Example: in 2011, catastrophic flooding in Thailand inundated its industrial areas, thereby affecting multiple computer hard drive manufacturers operating in the region. As roughly 25% of the world's computer hard drives are produced in Thailand, the flooding caused hard drive prices to increase globally by 20-40% (Suttor-Sorel, 2019).
 - Applies to: asset managers, commercial banks, insurers.

Legal liability risk:

Operations resulting in biodiversity loss may lead to lawsuits by the parties that incur damages. This risk may increase as governments and financial regulators ask for more disclosure and reporting regarding biodiversity impacts. With increasing transparency and companies not always pro-actively raising ESG issues, the risk increases of being sued for negligence.

- Example: BP and Exxon Valdez were sued for USD 65 billion for the damage incurred to natural resources and marine biodiversity following the 2010 Deepwater Horizon Oil Spill (OECD, 2019).
 - Applies to: asset managers, commercial banks, insurers.

Transition Risks:

Regulatory risk

New and stricter biodiversity related regulations are expected to be introduced, possibly resulting in transition risks and stranded assets (Suttor-Sorel, 2019).

- Example: in order to reduce nitrogen deposition (a contributor to biodiversity loss) in Natura 2000 areas, the Dutch state introduced nitrogen regulations under the PAS program. However, in 2019, the Council of State judged that the PAS program was no longer suitable and urged the government to make more stringent regulation, thereby affecting even more sectors in the economy (Programma Aanpak Stikstof: achtergrond en inhoud, 2019).
- Example: a recent law in the Netherlands has stated that all Dutch office buildings need to have at least a level C energy label by January 2023. If this is not achieved, these offices will need to be closed. Stringent biodiversity regulations could follow such an example and impose transition risks on financial institutions (Regelink, Reinders, Vleeschhouwer, & van de Wiel, 2017).
 - Applies to: asset managers, commercial banks, insurers

Reputational Risk:

Reputational risks

Clients and financiers may withdraw from companies if these companies neglect the risk their environmental externalities may have for their (client's) reputation. This risk occurs in two ways for financial institutions. On the one hand, clients can choose to opt for a bank with a more sustainable reputation. On the other hand, financial institutions may also be affected by negative behaviors of their clients. Financial institutions are therefore expected to have an engagement strategy in place to deal with ill client behavior.

- Example: a large forestry company lost five percent of its revenues overnight when its major buyers backed out following significant reputational damage done to the firm due to campaigning efforts by Greenpeace (Evison & Knight, 2010).
 - Applies to: asset managers, commercial bank, insurers.

2.2 Financial Biodiversity Risks in Practice

It is important to mention that not all financial institutions are subject to the same biodiversity related risks. Despite the differences between each financial institution, three main types of financial institutions can be distinguished: 1) banks, 2) asset managers/pension funds and 3) insurers. An important difference is that banks, pension funds and insurance companies mainly invest for their own account, while asset managers provide investment services for other institutions such as pension funds. The income of asset managers is dependent on the investment results they realize for their clients, where it is their fiduciary duty to realize the best results for their clients. They can also influence investment mandates by sharing knowledge and providing asset management services in the area of climate and biodiversity. Mulder (2007) discusses for each type of the aforementioned financial institutions their biodiversity risks, which often align with general environmental risks. A number of these are shown below and are complemented by the experiences of the working group. They show the practical implementation of the risks mentioned under 2.1.

Banks

Time horizon of the loan

Loans with longer time horizons are exposed to more risks over time. With the full extent of biodiversity loss not being known yet, this poses greater risks to loans with longer time horizons.

Non-recourse

"When the pay-back of a certain loan is fully determined by the revenue generated by a specific activity / project (i.e. non-recourse cc), there is a greater need to look beyond conventional types of risks and also take into account biodiversity considerations when the impacts on ecosystems are thought to be substantial" (Mulder, 2007, p. 48).

Asset Managers/Pension Funds

Investments in companies with high impacts on ecosystems and/or ecosystem dependent companies

Investments in companies that are highly dependent on ecosystems will be at risk if ecosystems degradation and biodiversity loss affect the value of the company.

Time horizon of the fund

Generally speaking, it can be argued that funds that operate over a longer time horizon are more prone to biodiversity risks than funds that typically turnover within months. The long-term horizon in which private equity (PE) funds operate, for example, make them potentially more prone to biodiversity risks than hedge funds based on this particular factor (Mulder, 2007).

Insurers

Environmental liability

Often biodiversity is difficult to insure directly therefore biodiversity issues for insurers mainly arise from property damage or personal injury. For example when a company has polluted the environment causing biodiversity damage to surrounding properties, or if deforestation leads to water damages which in return are covered by insurance policies, thereby increasing payouts by insurance companies.

Insurers also have investments for their own account and in that respect their risks are similar to those mentioned for asset managers/pension funds.

3 Humanity's Negative Impact on Biodiversity

Over the past 50 years, the global economy has grown roughly fourfold and our population size has doubled to nearly 8 billion people. During the same time-period, our ecological footprint has increased by 190% (Bluet & Ionescu, 2019). As a consequence, mankind is exerting ever increasing pressure on ecosystems and the services they provide. Sadly, according to the IPBES, the world's most comprehensive biodiversity monitor, humanity has significantly altered 75% of the earth's land surface and 66% of the ocean area is experiencing negative impacts due to biodiversity loss (Díaz et al., 2019). This significant decline is the result of the following biodiversity loss drivers listed below, which are ranked in descending order by their severity:

1. Changes in land and sea use, primarily agricultural expansion which comes at the cost of clearing natural environments.
2. Direct exploitation of natural resources.
3. Climate change.
4. Pollution.
5. Invasive (plant and animal) species.

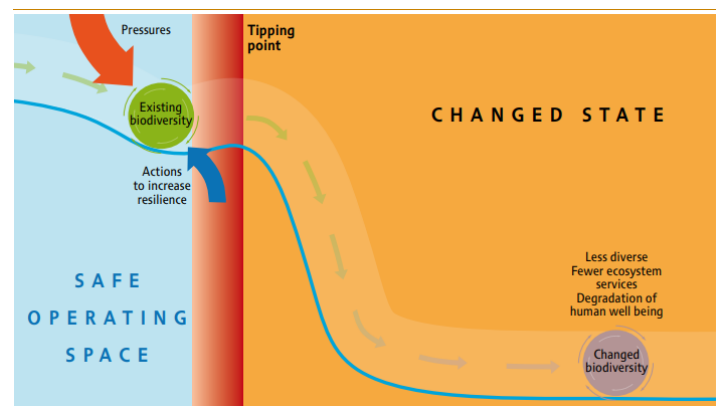
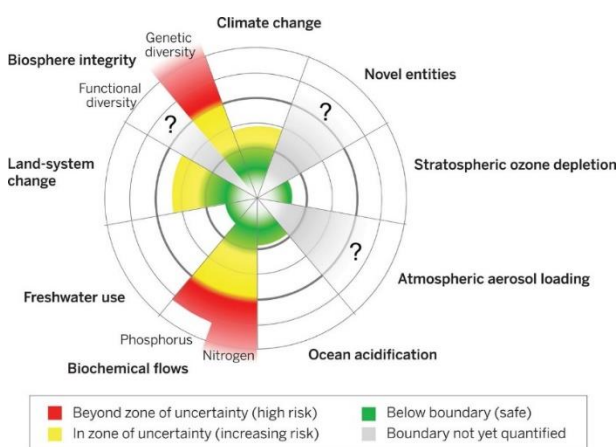


Figure 4: (left) The nine planetary boundaries within which humanity can continue to develop and thrive for generations to come (Steffen et al. 2015). Figure 5: (right) visualization of how passing a system threshold can lead to a deteriorated state of biodiversity (Secretariat of the Convention on Biological Diversity, 2010)

Our major terrestrial biomes have seen a decline of 20% in the number of native species. Another 25% of global species are threatened and up to 1 million species can face extinction if urgent action on biodiversity is not taken. If we continue our business as usual, we will continue to surpass the Planetary Boundary (see glossary) for biodiversity (genetic diversity in the framework) and exceed a threshold where a sudden and possibly irreversible decrease in global biodiversity is experienced. Importantly, with regards to genetic diversity, humanity is estimated to be already in the red zone and heading off to overstepping the global threshold (Steffen et al., 2015) (Figure 4). Once we cross this threshold, we could roll into a state characterized by a large-scale ecosystem collapse, food shortages and disease (Figure 5).

Importantly, according to the IPBES, as a result of the integrated and indivisible nature of the Sustainable Development Goals (SDG), biodiversity loss will also undermine 80% of the goals related to health, water, hunger, poverty, cities, land and oceans (Díaz et al., 2019). Because of biodiversity loss, humanity is already dealing with the following problems:

- Globally, land degradation has resulted in an agricultural productivity loss of 23% since 1970 (Díaz et al., 2019). Specifically, annual crop loss in Europe due to soil degradation is valued at around 1.25 billion euros. The EU agricultural area suffering from severe erosion, estimated at 12 million hectares, annually loses around 0.43% of their crop productivity (Panagos et al., 2018)
- Globally, the area of mangroves has declined by 20% between 1980 and 2005, the seagrass area has declined by 29% over the past 100 years and the world lost approximately half of its coral in the past 30 years. Together, the destruction of these habitats releases an estimated 0.15 – 1.02 gigatonnes of CO₂ per year, leading to economic damages ranging from USD 6 – 42 billion (OECD, 2019). Mangroves can also play an important role in coastal protection. This further contributes to the economic damage resulting from mangrove decline (Universiteit van Utrecht, n.d.).
- Changes to terrestrial land cover have resulted in an ecosystem loss worth USD 4-20 trillion per year (OECD, 2019). For example, due to urbanization and intensive agricultural practices, the Netherlands has lost 85% of its original biodiversity (Van Gerwen et al., 2014).
- Due to the loss of protective environments such as coral reefs, mangroves and wetlands, the lives and properties of 100 – 300 million people, living within coastal flood zones, face increased risk to hurricanes and floods (Díaz et al., 2019). In a business as usual scenario, countries which rely heavily on coastal agriculture, such as New Zealand and Singapore, will lose 2.1-4.7% of their GDP every year by 2050 (Roxburgh et al., 2019).

As demonstrated by the examples above, the consequences of biodiversity loss are already visible today. However, preserving biodiversity has not yet reached the same level of urgency as climate change. One contributing factor is that we still do not have a complete understanding of the interactions between nature and society. For instance, ecosystem services are not yet properly priced since they are considered public goods, thereby presenting little to no economic incentive to preserve them (Sutton-Sorel, 2019). To put the urgency into perspective, the long run economic damages of greenhouse gas emissions, based on 2008 figures, were estimated to be around USD 1.7 trillion per year. Economic costs from biodiversity loss, for the same year, were in the order of magnitude of USD 2-4.5 trillion². This comparison provides a clear message that both phenomena are equally urgent, also for financial institutions, and require immediate action (Evison & Knight, 2010).

² As mentioned, pricing ecosystem system services is difficult. Therefore, the following monetary valuation are rough estimates.

4 Opportunities for People, Planet and Profit

It is important for financial institutions to take the risk of biodiversity loss into account. However, it is also good to know that biodiversity can have a positive impact on operations, loan quality and investments. For example, agriculture is one of the main causes of biodiversity loss but by practicing sustainable agriculture it can also contribute to the mitigation of this effect (Díaz et al., 2019). Next to the positive influence on output, other positive externalities include:

- Lower operating costs due to reduced inputs of crop production products.
- Climate resilience as healthy soils are better suited to handle droughts and floods.
- Higher value for produce as consumers trends are moving towards organic foods.

Whether the sustainable practices are categorized as “Sustainable Intensification”, “Organic Farming”, “Regenerative farming”, “Agroforestry”, “Biological”, “Ecological” or “Biodynamic” farming, one will have to take these aspects into consideration, in order to ensure the continued sustainability of the agricultural business activities and good stewardship of the natural capital base of the land. Inspiring examples, showcasing the benefits of sustainable agriculture, are found below:

- The Costa Group a grower, packer and marketer of fresh fruit and vegetables in Australia, has, as part of their Sustainable Commercial Farming policy, commenced the use of Integrated Pest Management (IPM) and a nutritional program to enhance soil biology. IPM involves the use of beneficial insects as a way to reduce (the costs of) chemical usage and increase biodiversity while growing premium fruit. Slashing of grass is avoided in the lead up to using IPM in order to allow inter row weed and grass growth with these areas acting as an insectary and providing an important source of pollen for adult beneficial insects. The nutritional program involves the use of a blend of products from both synthetic and organic sources. The aim is to enhance soil biology by creating a more dynamic environment and increasing biodiversity, whilst maintaining soil quality and reducing soil degradation (Costa Group, 2019).
- The coffee cooperative of De La Gente produces shade-grown coffee to ensure its product is of high quality. All De La Gente coffee is arabica, which grows well at higher altitudes and in cooler temperatures. The cooler temperatures from the altitude and shade slows the growth of the beans, and causes the beans to be more dense. Beans with higher density develop more flavor and acidity meaning they are of a higher quality and are better tasting. Shade-grown coffee that is sold as specialty coffee can result in a greater income for the farmer although some of the land management practices are more labor intensive. A result from the increased biodiversity is that growing different varieties of crops together increases their resistance levels to pests and diseases. For example, having more diversity of trees can create more habitat for a greater diversity of bird species. Birds aid the growth of coffee by serving as natural predators for coffee pests. Sun grown coffee removes this natural barrier to pests and requires a greater use of chemical pesticides to keep pests and diseases at bay (Chudnovsky, 2017).
- Protix is an insect ingredient company and with that aims to contribute to a sustainable food system by developing ingredients from insects. The company uses a special insect chain to create feed from food scraps. The insects feed off these food scraps and are then processed sustainably into high quality proteins for animal feed. Protein is an essential nutrient of many animal feeds and is often derived from soy beans. However, increasing soy bean production is the cause of extensive deforestation in producing countries, whereas insects constitute a sustainable alternative (Protix, 2020).

- The Dutch supermarket chain Albert Heijn and the *Natuurmonumenten* organisation agreed with contracted Dutch potato growers to plant wildflowers and herbs across field borders. The expectation is this will increase biodiversity, improve water quality, and allow for a decrease of pesticide use, for instance by increasing the number of natural predators like ladybugs that can control pests like aphids (Albert Heijn, 2019). Moreover, the supermarket chain is working together with dairy farmers of Royal A-ware and Dairy Cooperative DeltaMelk to make the dairy that they sell more sustainable. As part of the initiative, they have taken a number of steps to enhance nature at the farms. These steps include each of the participating dairy farmers getting an insect hotel. Where possible and if the farmer agrees beehives will be placed and there will be a rest period for the land from April 1st till June 1st where the cows can go onto the grassland but the grass is not allowed to be mowed.
- The Loess Plateau around the Wei River valley in China had one of the highest erosion rates in the world due to overgrazing and overexploitation. This led to high poverty rates and low production. By introducing sustainable agricultural production, the environment was restored, Approximately 2.5 million people were lifted out of poverty and the average income of the local farmer doubled (World Bank, 2007).

Restoration of Loess Plateau, China



Source: J. Liu, *Hope in a changing climate* (2009)

Examples can also be found beyond agriculture. The business case for biodiversity conservation often centers around yield enhancements or cost savings, but in many business sectors also around the creation of new products and business lines, improved product quality, marketing and branding, regulation and control and/or social license to operate.

- Rehabilitation and mine closure are planned and considered across all stages of modern mine development and operations. Rehabilitation of a mine is important for improving basic ecosystem functions such as erosion control and water quality regulation.

The ENCI is an open pit limestone quarry and cement producer in the Netherlands and part of the HeidelbergCement group, one of the world's largest building materials companies. For decades the ENCI has caused disagreement locally. At the center of this conflict was the continuation of marl extraction versus the protection of nature, with local civil society groups demanding closure of the quarry in 2010. In the end ENCI, the City of Maastricht and the Province of Limburg agreed on the termination of limestone quarrying in 2018 and also on the future development of the area from 2010 onward (Arcadis, 2014).

- Ørsted is the largest energy company in Denmark and the largest offshore wind farm company in the world. It divested all of its upstream oil and gas assets in 2017, rebranding its name from DONG (Dansk Olie og Naturgas) to Ørsted. Their offshore wind biodiversity policy underpins Ørsted's efforts to protect the natural environment around their offshore wind farms. On its website the company states this policy is needed as the offshore wind industry becomes truly global, and as biodiversity protection becomes a competitive factor in the development of offshore wind farms. The focus areas of Ørsted for biodiversity impacts are (Ørsted, 2018):

 - Potential noise impact on marine mammals from installation of wind turbine foundations
 - Potential impact on birds' migration routes and feeding grounds from wind turbines
 - Potential impact on seabed ecosystems and coastal environments from installation of transmission cables

- L'Oréal, a leader in cosmetics, has committed to using plant-based materials that respect the principles of the Convention on Biological Diversity. Currently, 59% of its material are plant based, with the material being sourced from over 340 different plant species. Next to the incorporation of sustainable materials, L'Oréal is also trying to develop a sustainable and traceable supply chain. For example, by developing collaborative partnerships with its candelilla wax suppliers in Mexico, L'Oréal has improved the livelihoods of 165 local producers and helped preserve the fragile ecosystem of the Chihuahua desert (op2b, 2019).

- Kering is a French international luxury group with brands including Gucci, Balenciaga and Yves Saint Laurent. Through their pioneering Environmental Profit & Loss (EP&L) methodology, Kering is able to assign a monetary value to its environmental footprint. By using this corporate natural capital accounting methodology, Kering guides its prioritization of actions around mitigating impact and identifying supply chain and sourcing approaches that can deliver positive outcomes for biodiversity. Kering considers sustainability a driver of innovation and value creation (Kering, 2020).

- Rijnland is a Dutch water authority that has received the Pro Flora et Securitate (For Flowers and Security) award in 2020 for creating a safe and biodiverse dike. The so-called 'flower power dike' in Warmond has a vegetation consisting of a rich mixture of herbs and grasses. A wide variety of plant species results in a well-developed root-system making the dike much more resistant to erosion than solutions that are less biodiverse. It is also likely the dike is stronger and more resilient in a climate with increasing weather extremes. This nature based solution therefor also possibly provides future benefits to the water authority (STOWA, 2019).

5 What Steps Can Financial Institutions Take?

Based on 2010 figures, around USD 51 – 53 billion per annum is spent globally on funding biodiversity and ecosystem services. This capital comes primarily from bilateral aid, government funding, agricultural subsidies and the development of product certification (Parker et al., 2012). As previously mentioned, the Convention on Biological Diversity (CBD), however, has estimated that a global investment of USD 150 – 440 billion per year is needed in order to achieve the goals set within the 2020 Aichi Targets (Bor, Müller, & Duke, 2018). With post-2020 targets being drafted this investment need is not likely to decrease (Convention on Biological Diversity, 2020). It is clear that additional funding is required and that we, as financial institutions, need to play a leading role in redirecting investments towards biodiversity investment while at the same time minimizing the risks related to natural capital loss. As such, there is also a role for financial institutions to make their impact on biodiversity measurable and to develop new investment models and funding pipelines that will help achieve the 150-440 billion funding need (CPICfinance, n.d.). The EU Business@Biodiversity Platform advises financial institutions the following steps in order to accelerate the financing of pro-biodiversity innovation:

- Building capacities among financial institutions and businesses
 - Develop a better understanding of biodiversity and its role in pro-biodiversity projects and innovations.
 - Develop partnerships that allow the formulation of bankable biodiversity projects that deliver benefits to multiple stakeholders.
 - Stimulate the emergence of environmental brokers and orchestrators
 - Develop in-house knowledge and expertise regarding sectors that have significant negative impact on biodiversity
 - Build expertise amongst business and NGOs in how to design bankable pro-biodiversity projects
- Setting targets and establishing standards
 - Develop positive biodiversity targets, strategies and roadmaps in order to align natural capital restoration with the strategy of the firm.
 - Develop consistency and uniformity regarding corporate accounting and reporting for biodiversity. Financial institutions need to work together to create a criteria for biodiversity risk which can then be implemented in risk rating systems and pricing.⁸
 - Develop standards, metrics and open data sources in order to create a clear picture of pro-diversity projects and innovation.
 - Develop financial products that allow consumers to invest in pro-biodiversity projects
 - Applying innovative frameworks that allow the potential of products and supply chain for nature-based solutions (e.g. green infrastructure) to be assessed.

Inspiring biodiversity initiatives within the financial institutions can be found below.

Actions Being Taken in the Netherlands:

■ Deltaplan for Biodiversity Recovery

A large number of partners has set-up the Delta Plan for Biodiversity recovery. These partners include amongst others water authorities, commonland, as well as Rabobank and other land users/owners. The Delta Plan identifies five success factors that make it simple and attractive for land users to contribute to the restoration of biodiversity. These five success factors are shared values, development of new business models, incentivizing and

consistent laws and regulations, knowledge and innovation, and collaboration with all regional land users. By creating a single measurable performance standard for activities it becomes easier to reward those that take steps on biodiversity recovery. By becoming a partner or supporter of this initiative, organizations can contribute to biodiversity conservation in the Netherlands.

IUCN NL pledges

With support from the Dutch Ministry of Agriculture, Nature and Food Quality (LNV), IUCN NL is compiling and catalyzing pledges of existing and new initiatives for biodiversity to develop the Dutch Action Agenda for Nature and People. At the upcoming biodiversity summit in Kunming (China), a biodiversity agreement will be on the agenda to set concrete targets on biodiversity. The Dutch Action agenda will contribute to this. Each pledge for the Dutch Action Agenda contributes to the goals of the Biodiversity Convention (CBD): 1. conserve biodiversity; 2. sustainably use of biodiversity and 3. fairly and equitably share its benefits. Pledges can be made on the IUCN NL website.

International

Business for Nature

Business for Nature is amplifying a business movement for nature by a) convening a united business voice, b) demonstrating business ambition, c) showcasing business solutions and d) communicating the business case for reversing business decisions. The Business for Nature initiative is building a library for business solutions, the business case and policy solutions. On the website of the business for nature initiative institutions can engage with them.

Conservation international (CI) and BHP

CI and BHP have developed a multi-step Biodiversity Impacts and Benefits Framework that considers site-specific biological complexity and aims to evaluate the effectiveness of the biodiversity-focused activities undertaken by BHP, both 'inside the fence' as a part of mitigating its operational activities and 'outside the fence' as a part of its broader social investment contributions. In a proposal request they have asked others in the biodiversity community to contribute to advance thinking on corporate biodiversity indicators.

One Planet Business for Biodiversity (OP2B)

OP2B is an international cross-sectorial, action-oriented business coalition on biodiversity with a specific focus on agriculture. The coalition's aim is to drive transformational systemic change and action to protect and restore natural biodiversity within value chains. Furthermore, the coalition aims to engage institutional and financial decision-makers and develop/promote policy recommendations in the CBD COP 15 framework. It is hosted by the World Business Council for Sustainable Development (WBCSD) and currently consists of twenty-one companies.

6 Partner Best Practices

The final section of this paper will investigate how biodiversity measures are being implemented in the day-to-day operations of financial institutions. This will be showcased by case studies by the members of the Working Group Biodiversity. It shows how a wide spectrum of financial institutions, ranging from insurers to asset managers and from banks to pension funds, deals with biodiversity in its lending, investments and risk assessments. The following case studies show that even though biodiversity loss is a daunting problem and can be difficult to grasp for financial institutions, there are those who are leading the change. These case studies have been written by the individual working group member organizations and reflect the views of the working group members individually.

6.1 Case Study Actiam

Actiam is a Dutch asset manager with a portfolio worth over €60 billion, which offers sustainable solutions to a wide range of institutional and private asset owners. In light of the global trend of a growing world population and consequential scarcity of essential resources, Actiam developed a new strategic plan in 2015. This plan focused on three sustainable themes for its investments and asset management; climate, water and land. For each theme, Actiam defined targets and monitors progress by measuring the carbon, water and deforestation footprints of its investments. Since last year, Actiam updated its strategy, which expands its scope to include factors such as social and human capital, chemicals and biodiversity loss. Companies contributing to the loss of biodiversity are causing financial risks to Actiam. This can be due to reducing land productivity, preferences for sustainable consumption, which may reduce companies' value or companies' actions may result in lawsuits. It is therefore important for Actiam to properly assess the biodiversity footprint throughout its portfolio. Actiam is taking action and is cooperating with other financial institutions such as ASN Bank and CDC Biodiversité, to find common ground in biodiversity footprinting methodologies.

How does Actiam manage for biodiversity in its investments?

Actiam has set up its own rating system to categorize the companies in which it invests. This rating system assesses how companies are currently behaving and how they are preparing themselves for future sustainability transitions. Related to biodiversity, the key capture is that ACTIAM considers how companies are dealing with biodiversity risks. For this, ACTIAM uses scores and assessments supplied by several ESG data providers, such as MSCI. For biodiversity, the ACTIAM rating system puts emphasis, for instance, on certification, exposure of companies and their supply chains in high value conservation areas or fragile ecosystems, and efforts to reduce land disturbance or increase biodiversity protection. This is area- and industry-dependent. Actiam considers whether companies' biodiversity strategies are sufficiently flexible and agile to conform to new market standards and the transition required for a sustainable society. As a result, Actiam may start engagement with a company to promote a change in behavior or ultimately not invest in the company. Concentrating not solely on biodiversity impact, but also on a company's transition to enhance its biodiversity impact, is important in Actiam's sustainability policy.

Following the screening procedure, ACTIAM categorizes all companies into three different categories. They are either categorized as 'adaptive' if they sufficiently keep account of their biodiversity risks, 'at risk' if they have the capacity to take into account biodiversity risks but don't do so sufficiently or 'non-adaptive' if they lack the capacity to adapt to the ongoing sustainability transitions. Actiam does not invest in the last category of companies. Importantly, Actiam's sustainability funds are only allowed to invest in companies that qualify as 'adaptive'. The thresholds between each category were developed using scientific evidence, expert insight and by keeping a precautionary principle in mind.

Actiam engages companies that have the capacity to improve its policies and management practices of biodiversity-related topics, such as raw material sourcing, water management, supply chain certification, de/reforestation. Importantly, Actiam acknowledges that ensuring effective engagement depends on information that is not always readily available. For example, a company's supply chain can be non-transparent and therefore difficult to determine whether they are operating in high value biodiversity areas. As a result, Actiam has started a strategic partnership with Satelligence, a satellite imagery company that is able to detect and monitor activities that lead to biodiversity loss, such as deforestation. Using satellite imagery, Actiam plans to approach companies

in its portfolio and use evidence-based engagement to determine whether they are adhering to its biodiversity commitments.

What does Actiam need to move its biodiversity policy to the next level?

Actiam acknowledges that, due to the size of its portfolio, it is unable to screen all their investments in great detail individually. Many of the tools which are being developed today, such as ENCORE, are not readily applicable to an asset manager, as they are not company-specific enough and do not provide sufficient detail about annual biodiversity impacts for all companies in the investable universe. Importantly, Actiam would like to have data that allows them to map a company's supply chain more effectively, thereby adding transparency to the possible biodiversity risks a company is facing. Organizations, such as Trase.Earth and Trase.Finance, are working on this. However, significant strides still need to be made, also in the realm of public reporting on sustainability by companies.

How is Actiam accelerating the financing of pro-biodiversity innovation?

Actiam is undertaking a number of steps, mentioned in chapter 5, in order to accelerate the financing of pro-biodiversity innovation. For example, the cooperation between Actiam, ASN and CDC Biodiversité is a good example of an initiative that allows the formulation of common grounds to measure biodiversity impacts. This initiative also helps in setting targets and establishing standards, specifically, concerning developing consistency and uniformity regarding corporate accounting and reporting for biodiversity. Moreover, through its strategic partnership with Satelligence, Actiam is developing in-house knowledge and expertise regarding sectors that have a significant negative impact on biodiversity. Lastly, through these different initiatives, Actiam contributes to setting positive biodiversity targets, strategies and roadmaps with its customers.

6.2 Case Study APG

APG Group provides services such as executive consultancy, asset management, pension administration, pension communication and employer's services. APG performs these activities on behalf of (pension) funds and employers in the sectors of education, government, construction, cleaning and glass cleaning, housing associations, energy and utility companies, sheltered employment, medical specialists and practices of architects. APG manages € 533 billion (February 2020) in pension assets for its clients in these sectors.

APG's mission is 'Building your sustainable future together'. APG invests the pension contributions that members of their pension fund clients and employers pay each month in various asset categories, such as real estate, equities and bonds. In doing so, APG aims for the best possible return at an acceptable level of risk. In addition, APG wishes to invest in a manner that is sustainable and responsible, aiming to generate a return befitting a socially committed company, which, in the interest of the pension funds and their members, is both solid and financially stable.

How does APG manage for biodiversity in its investments?

Inclusion Policy

APG and its clients are convinced that companies that pay sufficient attention to people, the environment and good governance perform better in the long term. Through the Inclusion Policy we make conscious choices as to which companies to invest in, based on an integral assessment of risk, return, costs and sustainability. The entire investment universe of around 10.000 companies is assessed for responsible business conduct in the areas of environment, labor practices, human rights, and anti-corruption. Within the area of environment, we look at issues such as climate change, pollution, waste, natural resources and biodiversity.

APG only invests in companies where the assessment demonstrated that they pay sufficient attention to people, the environment and good governance. If companies lag in any of these areas, we only invest if we have a concrete plan and objectives for engagement with the company such that the company improves its performance. With the inclusion policy, APG has implemented the guidelines of the OECD (Organization for Economic Cooperation and Development) regarding the systematic identification of ESG risks in the portfolio and exerting influence on companies to reduce these risks.

Sustainable Development Investments

Besides carefully setting requirements for the companies that we invest in, APG's clients have also set concrete targets to contribute to sustainable development. At the end of 2018, APG had invested € 69.2 billion in companies that contribute to the Sustainable Development Goals of the United Nations. In addition, the carbon emissions of the companies in the equity portfolio was reduced by 28%.

In order to determine whether a company contributes to the UN Sustainable Development Goals (SDGs), APG together with PGGM have developed a taxonomy to identify products and services by companies that contribute directly to one of more of the SDGs. For example, windmills and solar panels contribute the SDG7 on clean energy. It requires a huge effort to determine to what extent companies produce SDG-related products and services. That is why ENTIS, APG's data analysis team, has developed a unique method to assess this with the aid of artificial intelligence. ENTIS uses smart algorithms to determine whether a (listed) investment can be regarded as a Sustainable Development Investment, (SDI). Human intervention is still

required, because the quality of available data is still insufficient and because the human expertise in interpretation of data cannot be simply replaced by technology. SDGs that are directly related to biodiversity include SDG14 (life under water) and SDG15 (life on land), in which APG has invested hundreds of millions.

Zero Deforestation

Given the large impact of land-use related industries on biodiversity, APG pays special attention to deforestation in food supply chains. Our focus is on key commodities including palm oil, soy and cattle. APG has a team of specialists who talk to the companies on location to encourage them to produce palm oil in a more sustainable manner. APG has been doing this since 2011, when we helped to establish the PRI Investor Working Group on Sustainable Palm Oil. Since 2017 APG expanded that collaboration with PRI and other investors to also address deforestation associated with soy and cattle production in Brazil. APG is engaging with a number of companies across the cattle and soy value chains to require appropriate management and disclosure of deforestation risks in their supply chains. The initiative is now called the UN PRI – Ceres Investor Initiative for Sustainable Forests.

Furthermore, in 2018, APG joined the initiative of seventy food producers and supermarket chains to stop the deforestation of the Brazilian Cerrado region. This savannah area is one of the most important and endangered ecosystems in the world. Due to deforestation in connection with agriculture, large sections of these forests have disappeared in recent years. Together with international buyers and investors, APG is supporting and encouraging local Brazilian industry and NGOs to get to a biome-wide agreement on zero-net-deforestation. In its real asset investments in agriculture APG applies strict zero deforestation policies where applicable.

What does APG need to move its biodiversity policy to the next level?

For global investors like APG it is critical that data and measurements are available regarding the sustainability performance of companies, such that these factors can be integrated into investment decision-making. While our policies include data and indicators related to biodiversity, as outlined before, there is much room for improvement in terms of data quality and availability. APG therefore supports the call for enhanced company disclosures regarding biodiversity measurements and impacts.

How is APG accelerating the financing of pro-biodiversity innovation?

Natural Capital stewardship is at the center of APG's investment policy in agriculture and forestry. Preserving the Natural Capital base of these investments is in the best interest of a long-term investor and its clients. The development and implementation of tools and policies to measure and control aspects of resilience and sustainability but also of future profitability, such as; soil health, water use and quality, greenhouse gas emissions and sequestration, biodiversity and responsible and efficient input use, is an important part of good stewardship.

6.3 Case Study ASN Bank

ASN Bank ('ASN') is a Dutch retail bank, founded in 1960, with a particular focus on socially responsible and sustainable investments. In order to preserve our environment, ASN believes that solely concentrating on climate is not sufficient. As different sustainability themes are systemically connected with each other, it is also important to concentrate on preserving ecosystems. As a result, ASN's sustainability policy consists of three pillars; human rights, climate and biodiversity. Importantly, ASN's biodiversity ambitions are highlighted by the bank's ambitious goal to have an overall net positive effect on biodiversity for all its investments by 2030. In order to achieve this, ASN became the first bank in the world to measure the biodiversity footprint of its investment portfolio using the Biodiversity Footprint for Financial Institutions methodology (BFFI).

How does ASN account for biodiversity in its investments?

As mentioned, ASN assesses its biodiversity footprint using the BFFI methodology. The development of this methodology started in 2015, following multiple stakeholder meetings, including expert organizations like PBL. The goal of the stakeholder meetings was to explore what stakeholders expect from ASN Bank with regard to biodiversity. Following this stakeholder process, it was decided that before ASN could make any improvements, the bank first needed to know what the impact was of its investments. As a result, the BFFI methodology was developed together with partners CREM and PRé Sustainability.

The first step of the BFFI involves investigating what economic activities companies (ASN's investees) are involved in and how these activities put pressure on the environment. This is determined by going through the annual reports of the companies and by using the Exiobase database, which provides environmental input-output data for roughly 90% of the global economic activity. In order to make the BFFI applicable on a portfolio level (which can contain thousands of companies), a biodiversity measurement on site is not realistic. Instead, the environmental impact of a specific sector, in a country, is determined using the Exiobase database. This expresses environmental impact not only in the form of carbon emissions, but also in pressures such as land use. Following this calculation, the environmental pressures are run through a program called ReCiPe. ReCiPe is an impact assessment model developed by LCA professionals, which quantitatively determines the pressure-impact relations for terrestrial, fresh water and salt-water biodiversity. ASN realizes that a lack of onsite measurements will lead to uncertainties in the results. Therefore, the BFFI also includes a qualitative assessment to enable a correct interpretation of the calculated footprint score. The qualitative assessment looks at the limitations of the calculations and identifies areas where the actual footprint might be higher or lower than calculated using the ReCiPe methodology. The results of the BFFI can then be used to start effective engagement with the companies in question.

Since the pilot study, the methodology has continuously been improved and in 2019 the footprint step of identifying the economic activities of investees (a relatively time-consuming step) was automated. This was an important step, as it means that the BFFI methodology could then be broadly employed by larger financial institutions. In addition, ASN is constantly seeking to contribute to the improvement of biodiversity measurement methodologies throughout the financial sector. These efforts were showcased in the groundbreaking 'Common Ground' report published in 2018 together with Actiam and CDC Biodiversité.

Furthermore, ASN Bank is also a leading member in the Partnership Biodiversity Accounting Financials (PBAF) initiative. This partnership aims to investigate how a bank or investor can measure and contribute to the

conservation and sustainable use of biodiversity. By working together throughout the financial sector, PBAF aims to become as successful as PCAF, which focuses on carbon accounting. Next to measuring the negative impact on biodiversity, PBAF is also focusing on ways to measure biodiversity positive investments.

What does ASN need to move its biodiversity policy to the next level?

ASN states that more data is required in order to get to conclusions that are more robust. Furthermore, more interest from the financial sector and government in biodiversity would lead to an influx of time and energy into the subject. If biodiversity is to become a common term in the financial sector, more companies will join initiatives such as PBAF.

How is ASN accelerating the financing of pro-biodiversity innovation?

ASN plays a significant part in accelerating pro-biodiversity innovation, as mentioned in chapter 5. Firstly, by setting the ambitious goal of being biodiversity-positive by 2030, ASN is aligning natural capital restoration with the strategy of the firm. In addition, through its BFFI methodology, ASN is making strides in developing consistency and uniformity regarding the corporate reporting for biodiversity. With the biodiversity footprint methodology automated, there is potential for the BFFI to be used on a wider scale within the financial sector.

Not only does the BFFI allow a company's supply chain to be assessed, it also contributes to creating a clearer picture for pro-diversity action and innovation. By working with external organizations, such as CREM and Pre Sustainability, ASN is also developing in-house knowledge on sectors that have a large impact on biodiversity. This knowledge can be used by the bank in its investment policy and investment decisions.

6.4 Case Study a.s.r.

a.s.r. is a Dutch insurance company with a history going back 300 years. Next to being an insurer, with its business fully restricted to the Netherlands, a.s.r. also has its own asset management branch with a portfolio of roughly 70 billion euro AuM. It is specifically through its investment portfolio where a.s.r. believes it has the largest impact on biodiversity, and is therefore, as a company, looking to how to make this impact measurable.

How does a.s.r. manage for biodiversity in its investments?

a.s.r.'s consideration of biodiversity falls within its Responsible Investment Policy. When scanning potential investments, a.s.r. grades countries and companies differently on their environmental performance. Countries are scored how they perform on SDG 14 and 15 (Life below Water and Life above Land) and 7 and 13 (Energy Transition and Climate Action). If, on average, a country scores below a certain threshold, then a.s.r. will not invest in that country.

Companies are rated externally on their environmental performance by ESG data provider Vigeo Eiris. They screen companies on more than 300 different criteria and then provide a final ESG score. Criteria include water pollution, deforestation and biodiversity. a.s.r. also maintains an exclusion list which forbids investments in companies involved in for example coal and tar sand mining, tobacco and arms manufacturing. Companies that violate environmental norms according to the UN Global Compact are also excluded.

Importantly, a.s.r. believes that engagement with companies who score poorly is crucial. Excluding a company can give a strong signal. However, by doing this you lose your influence as a shareholder to drive change. A potential tool to address biodiversity loss can be a joint engagement effort with other financial institutions.

Moreover, a.s.r. has set itself a target to have €1.2 billion allocated to impact investments by 2021. An example of an impact investment is the PYMWYMIC Healthy Ecosystems Impact Fund, which looks at biodiversity preservation as an investment case and promotes food security, climate change mitigation, poverty reduction and social stability. The fund invests in companies that seek to restore and conserve ecosystems, while making financials returns. Another example is Social Impact Ventures, through which ASR has invested in VanderSat, a company that has developed a proprietary technology that converts publicly available satellite data into soil moisture content, moisture content of vegetation and temperature. This data is used by (re)insurance companies, agricultural companies and water-management companies and it contributes to creating financial stability for drought-vulnerable, formerly uninsured smallholder farmers worldwide.

a.s.r. also manages for its policyholders and pensioners a significant farmland portfolio which was built up over more than a century. a.s.r. aims to provide a stable and secure income in combination with a relatively low risk character and to create 'perpetual value' through responsible stewardship by engaging farmers to pass on this valuable asset in a better condition to our next generation farmers.

The three pillars (1. sustainable productivity for a sustainable farmer's income, 2. adapting and building resilience to climate change and 3. reducing greenhouse gases emissions where possible) of Climate Smart Agriculture substantiate a.s.r.'s mission of creating perpetual value. Important in this respect is the ability to measure the farmers' efforts. This is why a.s.r. together with its partners Rabobank and Vitens initiated the charter coalition to develop the 'Open Bodem Index' (OBI, www.openbodemindex.nl). This index provides farmers insight in their soil quality based of the following aspects: structure, biology and chemistry. Based on the functionality of the soil and

the current management plan of the farmer, the OBI provides a list with suggestions the farmer could consider to discuss with his agronomist or agricultural consultant in order to improve the soil.

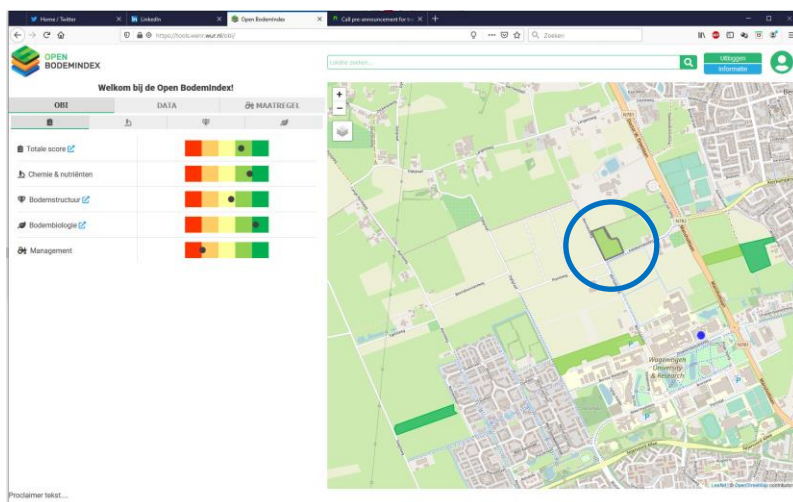


Figure 6: screenshot OBI online tool: analyses of the parcel centered in the blue circle

The charter coalition is now in the phase to scale up the number of (non)-commercial parties (within the periphery of the farmers) who are interested in the OBI data. Together with these parties a.s.r. will explore how to 'incentivize' farmers for their sustainable efforts to improve the quality of the soil and with that biodiversity.

What does a.s.r. need to move its policy on biodiversity to the next level?

a.s.r. acknowledges that due to the size of its portfolio, it is more difficult to steer effectively on biodiversity impacts. A solution could be a standard methodology, for example one such as PCAF, which allows to scan an entire portfolio on biodiversity impacts and effectively monitor these. In addition, it is important that the scientific and business community work together to develop indicators which are understood by all parties.

How is a.s.r. accelerating the financing of pro-biodiversity innovation?

By having a target on impact investments a.s.r. develops a better understanding of biodiversity and its role in pro-biodiversity projects and innovations. Additionally, by starting a coalition such as the one on the OBI a.s.r. is contributing to partnerships that allow the formulation of bankable biodiversity projects. This also contributes to the development of standards, metrics and open data sources that can foster biodiversity innovation.

6.5 Case Study FMO

FMO is the Dutch entrepreneurial development bank. It invests in over 80 countries, supporting jobs and income generation in order to improve people's lives in parts of the world where it can make the biggest difference. FMO's role extends beyond providing financing, as it helps businesses to operate and grow transparently in an environmentally and socially responsible manner. Through its financing and investments, FMO aims to enhance its and others' impact, and contribute to a sustainable society. FMO supports the 17 United Nations Sustainable Development Goals (SDGs) and aims to contribute to their achievement through its mission and activities.

How does FMO manage for biodiversity in its investments?

FMO's approach is driven by its Sustainability Policy Universe, which intends to protect people and the environment impacted by its own investments and those of its clients. FMO selects clients who are willing to work on improving their environmental, social and human rights performance, and contractually agrees improvement measures with them in order to mitigate any potential adverse impacts. FMO upholds a number of international standards, including the IFC's Environmental and Social Performance Standards (IFC PS), which set out requirements that aim to protect and conserve biodiversity, maintain ecosystem services, and sustainably manage living natural resources. In addition, FMO is covenanted through its exclusion list not to finance any activity involving the destruction of High Conservation Value areas. Some cases are presented below to illustrate how biodiversity considerations are integrated in FMO's investment process.

Client Selection

At this stage FMO identifies investment opportunities within its key markets that contribute to its core SDGs (8, 10 and 13), and assesses them against its exclusion list to ensure the financed activities would not involve the destruction of High Conservation Value Areas. Among other tools, FMO uses the Integrated Biodiversity Assessment Tool (IBAT) to inform its decisions.

The practice: when evaluating a potential investment in a hydropower plant in East Africa, it was found that the project site encroached an area that is home to a diverse and unique range of species and ecosystems, and that could be considered a High Conservation Value area. Moreover, project activities were predicted to severely impact biodiversity features and ecosystem services valuable for the livelihood of local populations. In view of the above, FMO decided not to proceed further with the evaluation of this opportunity.

Clearance in Principle

FMO performs an initial assessment of biodiversity risks and opportunities, scopes any further assessment needs, and documents these processes in a 'Clearance In Principle' (CIP) proposal, which informs its decision on whether to continue evaluating the potential investment.

The practice: a CIP proposal to invest in an agribusiness company operating in a densely forested West-African country was submitted to FMO's Credit department for evaluation. Although a significant part of the concession had been designated for the conservation of biodiversity values and high carbon stocks, most of the areas destined for plantation were already cleared at the time of evaluation of the proposal. Moreover, offsetting the loss of natural habitat was likely not feasible due to the limited availability of offset options in the country. In view of this, FMO decided not to proceed further with this investment.

Due diligence and decision to invest

FMO carries out a detailed project assessment, typically supported by independent experts in specialist fields. FMO performs a site visit, including visits to key stakeholders such as local communities and civil society organizations. The results of the due diligence are documented in a Finance Proposal (FP), which is evaluated by FMO Credit department before a final investment decision is made by the Investment Committee.

The practice: an FP to invest in a wind farm in a Latin American country was submitted to Credit for evaluation. The project would be located in the proximity of an Important Bird Area (IBA), hence bird collision with wind turbine generators was a potential risk. Taking comfort in the existence of appropriate mitigation measures and the client's willingness to implement these, the transaction was approved subject to additional impact mitigation actions that included adopting an adaptive biodiversity management strategy.

Monitoring and value creation

Throughout the lifetime of the investment, FMO monitors performance and progress and looks for opportunities to add value. FMO continues to work with its clients to ensure implementation of its ESG requirements. It reviews the client's and consultant's ESG monitoring, accident and incident reports, conducts client visits, and performs an annual client credit review. FMO also conducts a regular and systemic ongoing community support check.

The practice: FMO invested in a solar power company with operations in Latin America. The company was required to implement a reforestation plan to offset the biodiversity impacts of one of their projects. FMO closely monitored the implementation of this plan through independent advisors. After three years of operations, independent advice confirmed that reforestation efforts undertaken had exceeded seven-fold the requirements of the IFC-compliant reforestation plan, and sixty-fold the requirements of local law, and therefore the company had gone above and beyond compliance with its biodiversity offsetting requirements.

What does FMO need to move its policy on biodiversity to the next level?

FMO continues working on developing and enhancing its internal capacity on managing biodiversity risks and leveraging biodiversity opportunities. Further improvements are foreseen on the understanding and accounting of biodiversity loss-related risks for its investments, which can be expected to increase over time in view of the steep global loss of biodiversity we are experiencing. In addition, the focus of financial institutions is expected to progressively shift from the mitigation of negative impacts only, towards investing in companies and projects that aim to achieve net positive biodiversity gains through their operations.

How is FMO accelerating the financing of pro-biodiversity innovation?

As part of a sector-wide initiative, FMO has been building capacity in the Paraguayan banking sector for managing environmental (including biodiversity) and social impacts and risks associated with their investments, in close collaboration with leading NGOs such as WWF and other Development Financial Institutions. FMO has also financed companies with expected positive contributions to the protection and enhancement of biodiversity values and ecosystem services, like for example a pioneering impact investment vehicle that invests into marine and coastal enterprises aiming to improve food and climate security, improve livelihoods, and achieve marine biodiversity conservation. FMO is also a member of the Partnership for Biodiversity Accounting Financials (PBAF), an initiative that aims to advance on the development of methodologies for financial sector to measure biodiversity impacts (both positive and negative) associated to its investments.

6.6 Case Study NWB Bank

NWB Bank is a bank of and for the public sector with a special focus on water and sustainability. As a promotional bank, NWB Bank is committed to a stable and sustainable financial sector that contributes to an economy that serves society and causes the least possible harm to the environment. To a large extent, this is attributable to the bank's origins. The bank was founded in 1954 by the water authorities to help them raise the enormous investment needed to protect the Netherlands against water. Water authorities remain an important client group of NWB Bank. Climate adaptation, climate mitigation and improving biodiversity are among the core tasks of water authorities

To ensure the water authorities have sufficient resources and to be able to provide them with long-term lending in a sustainable manner, NWB Bank has been issuing Water Bonds since 2014. So far, a total of €4.6 billion in sustainable funding has been raised. The proceeds from these Green Bonds are used to finance water authorities' projects that contribute to climate mitigation, climate adaptation and biodiversity. The measures taken by the water authorities to improve biodiversity are focused on making surface water clean and ecologically healthy.

How does NWB Bank manage for biodiversity in its lending activities?

The 21 water authorities in the Netherlands use their 323 wastewater purification plants to ensure wastewater is sufficiently clean so it can be drained into the surface water without any adverse effects on water quality. Wastewater purification focuses mainly on removing the substances in wastewater that are most harmful to surface water. Those substances include phosphate and nitrate compounds, as well as oxygen-binding substances. Under European legislation, 75% of both the phosphates and the nitrates must be removed from wastewater, whereas a minimum of 90% applies to oxygen-binding substances in the Netherlands.

Examples of measures introduced by the water authorities to improve the quality of surface water include the creation of environmentally friendly shores and banks, the removal of polluted waterbeds and the construction of weirs passable to fish. An indicator that reflects the quality of the surface water is the percentage of bathing water locations that comply with the European Bathing Water Directive. There were 488 officially designated bathing areas in waters managed by the water authorities in 2018. That year, 96% of these locations consistently complied with the standards in the directive.

Each year, NWB Bank publishes a newsletter to provide the public and investors transparency into the use of proceeds from its Water Bonds. In this report, the bank follows the Green Bond Principles from the International Capital Market Association (ICMA). These principles have become the leading framework globally for issuance of green bonds. NWB Bank's Water Bonds are considered 'Dark Green' by the Norway-based Center for International Climate Research (CICERO), which means that they are consistent with the aim of creating a low-carbon and climate-resilient future.

Although not yet a signatory, the NWB bank applies the equator principles as part of their project finance lending. This means they support conservation including the aim of enhancing the evidence base for research and decision relating to biodiversity. Using external consultants to assess the compliance of a project with the equator principle enables NWB bank to obtain a good grip on possible biodiversity impacts.

What does NWB bank need to move its biodiversity policy to the next level?

The special relationship that NWB Bank has with the water authorities and other stakeholders helps to engage on bankable biodiversity projects that deliver benefits to multiple stakeholders. Although NWB Bank's pro-biodiversity projects and innovations as of today are focused on the activities of the Dutch water authorities, it is the bank's ambition to start engaging with a broader group of clients on this topic as to further push biodiversity. In order to facilitate this conversation, NWB Bank is investigating how to be better able to identify biodiversity risks amongst its other clients. Therefore, the bank will be setting targets and establishing standards.

For project finance, the bank is working on signing the equator principles through which the bank will take biodiversity impact into account. This will allow the bank to monitor if any of its project finance initiatives potentially influence biodiversity in a negative way. If this is the case, the bank will take appropriate action.

Additionally, NWB Bank is sponsor of the Working Group Biodiversity of the Sustainable Finance Platform that has been established by the Dutch Central Bank (DNB). Together with the previously mentioned members Actiam, APG, ASN Bank, a.s.r., FMO, Rabobank, Robeco, Erasmus University and Ministry of Agriculture, Nature and Food Quality, NWB Bank wants to bring further the conversation on biodiversity within the financial sector.

How is NWB accelerating the financing of pro-biodiversity innovation?

By implementing the equator principles in its project financing NWB Bank contributes to increased data on biodiversity projects helping to create a clearer picture of pro-biodiversity projects. Additionally, through sponsoring the biodiversity working group as part of the DNB sustainable finance platform and working together with the members on this subject, the bank aims to increase a better understanding of biodiversity amongst financial institution employees and the role financial institutions play with regard to biodiversity.

6.7 Case Study Rabobank

Rabobank is a Dutch multinational bank, operating in 44 countries with a strong focus on financing the Food and Agri (F&A) sector, which is a known contributor to global carbon emissions and loss of natural resources. As a global F&A bank, Rabobank highly values biodiversity and proactively engages in protecting and restoring biodiversity. Rabobank wants to be the leading partner for clients who want to make the transition to nature positive agriculture with the aim of creating value for clients, society and the bank.

How does Rabobank manage for biodiversity in its daily banking operations?

Rabobank is committed to avoid causing or contributing to adverse impacts on biodiversity and ecosystem services and strives for a net positive impact on biodiversity and ecosystem services. Furthermore, Rabobank aims for zero net deforestation by not engaging in transactions that are directly linked to deforestation activities and are committed to mobilize its resources to help achieve net zero deforestation by 2020 as part of its membership of the Consumer Foods Forum. In Brazil, home to a large part of the Amazon forests, Rabobank does not finance deforestation in any biome, even if legally allowed.

Rabobank realizes its commitments through policies, networks, stakeholder engagement, finance solutions and knowledge. Its Sustainability Policy Framework adheres amongst others to the Equator Principles and the IFC performance standards, including the biodiversity conditions set in these standards. Rabobank further expects its clients to not damage, cause or contribute to the conversion of high conservation-value or high carbon-stock areas, nor should they operate in legally protected areas, UNESCO World Heritage sites and RAMSAR wetlands unless the development is legally permitted and consistent with recognized management plans for the area. Clients are expected to not cause or contribute to a net reduction in the population of endangered species, nor intentionally introduce alien species. Clients are also expected to be efficient with natural resources and conduct (independent) ecological impact surveys and assessments.

The policy is implemented through the so called 'client photo' that is used to test compliance of clients with the policy. Rabobank engages with clients that do not satisfy the minimum sustainability criteria. If clients are willing to improve a time-bound plan will be agreed to bring the performance of the client within the minimum expectations of Rabobank so that financing can be continued. Furthermore, the client photo is used to assess the relative sustainability performance of clients and rate them frontrunner, average performers or laggards in their respective industries. The client photo is fully integrated in the credit decision process of Rabobank.

A key element of Rabobank's sustainability strategy is to accelerate engagement with (inter) governmental organisations, NGO's and the general public. As such Rabobank participates in all major F&A roundtables, networks and partnerships relating to key commodities, consumer goods and sustainable value chains.

Rabobank also has a long-standing partnership with the World Wide Fund for Nature (WWF). The mission of the partnership is to set up projects jointly with clients to achieve a sustainable food supply. Each project aims to demonstrate that economic returns and the conservation and restauration of biodiversity and ecosystems can go hand in hand. A flagship project under the partnership in the Netherlands is the cooperation with Royal Friesland Campina, a Dutch multinational dairy cooperative. In this project the Biodiversity Monitor for Dairy was developed. This is a science based and data driven biodiversity measurement tool that provides the farmer both with evidence of his contribution to biodiversity and knowledge on how to further improve it. The goal is to build a

new business model for the farmers by creating alternative revenue streams in the form of a higher milk price, lower interest rates and additional payments from for example water boards because better biodiversity result in lower costs of cleaning water.

In the Netherlands, Rabobank is one of the founding partners of the Delta Plan for Biodiversity Recovery, a coalition of farmers' organizations, food supply chain partners, researchers, nature and environmental organizations with the goal to preserve nature's capital and ecosystem services by 2030. This is done by encouraging land users in rural areas, agriculture and public spaces to restore biodiversity. Land users in agriculture can make a significant contribution to biodiversity recovery by integrating biodiversity management into farm operations. This will only happen if farmers are adequately appreciated and rewarded for their efforts. The Delta Plan facilitates this by calling for relevant laws and regulations, supporting education, raising public awareness, supporting tools to measure the impact on biodiversity and by driving regional cooperation.

Internationally, Rabobank leads the agriculture working group of the World Business Council of Sustainable Development. The ambition of this group is to scale agriculture that is positive for climate, nature and the farmer. Rabobank also invests in the development of knowledge on biodiversity. Together with partners it invests in biodiversity measurement tools such as a Biodiversity Monitor for crops together with BO Akkerbouw and WWF and the Open Soil Index together with a.s.r. asset management and Vitens, a Dutch water utility.

What does Rabobank need to move its biodiversity policy to the next level?

The change to nature positive agriculture can only be achieved with the support of the right policies. Rabobank is therefore also a partner in Business for Nature, a platform of influential organizations and forward thinking businesses hosted by the WBCSD, and wholeheartedly supports its call on governments to create policies that place nature at the heart of the global economy.

In addition to the right policies, Rabobank strongly believes that generally accepted tools to accurately and consistently measure biodiversity impacts of businesses and financial institutions are necessary to better shape its biodiversity commitments and targets and to improve its biodiversity assessments of clients. This will help Rabobank to better understand the needs and risks of its clients and provide them with tailored financial solutions that support the restoration and conservation of biodiversity.

How is Rabobank accelerating the financing of pro-biodiversity innovation?

Rabobank is a frontrunner in sustainable finance and offers a broad spectrum of solutions to help clients realize their sustainable ambitions. These range from green bonds, sustainability linked loans and impact loans to blended finance solutions. Rabobank is the founder of and investor in the Agri3 fund, a blended finance vehicle aimed at unlocking at least USD 1 bn in finance for nature positive agriculture. Projects financed by the fund must contribute to SDG 13 climate change and SDG 15 life on land.

Rabobank further provides innovative financing solutions to enable and reward farmers to invest in nature inclusive farming. In the Netherlands Rabobank runs a pilot to reward farmers in the top 25% on the Biodiversity Monitor with an interest rate discount. Rabobank wishes to scale the pilot nationally via a public-private partnership. Rabobank also launched an organic transition loan for farmers in the US who want to finance the transition period of becoming an USDA certified organic farmer.

6.8 Case Study Robeco

Robeco is an international asset manager with an extensive portfolio, ranging from equities to bonds, with EUR 173 billion AuM. Since its foundation in 1929, Robeco has been following a 'pioneering but cautious approach', which is still evident in its operations today. Both in its risk and sustainability work, Robeco bases all its decisions on extensive research, both for its investment strategies and regarding integration of sustainability into its investment process. Focusing on biodiversity loss as a material risk was therefore a logical choice for Robeco. Not only does Robeco want to minimize the biodiversity footprint of its investment, but by doing so, it also helps its investments gain a competitive advantage. Furthermore, RobecoSAM's partner S&P Global conducts the Corporate Sustainability Assessment (CSA), which is considered one of the most advanced ESG scoring methodologies available today and was developed in the past 20 years by RobecoSAM.

How does Robeco manage for biodiversity in its investments?

Biodiversity is a part of the Corporate Sustainability Assessment. This is an annual questionnaire which is sent to the 3800 largest global companies, part of the MSCI World, and comprises of an extensive set of questions related to various ESG indicators. Questions regarding biodiversity and their management are also mentioned throughout the assessment. A significant portion of the invited companies complete the assessment themselves, for the others Standard & Poor's conducts an external assessment of the company and the biodiversity scores are adjusted per sector. Per sector, the materiality of ESG risks are assessed and then compared to various criteria. Firms that have a lower negative impact on biodiversity score better in their overall ascore and therefore have a higher chance of entering Robeco's portfolio.

Furthermore, all fundamental holdings undergo a sustainability analysis that determines the effect of ESG performance, including biodiversity, on the profitability of the firm. This research is conducted by the Sustainability Investing team in Zurich. All findings resulting from the assessment are incorporated back into the investment case by the investment analyst or portfolio manager. Importantly, Robeco organizes a yearly event where clients come together to discuss the most relevant ESG issues. One of the topics in focus over the past year has been on biodiversity loss. In practice, twelve firms are selected and assessed separately on an extensive list of indicators, thereby going beyond the scope of the Corporate Sustainability Assessment. Through this process, an in depth dialogue is established with the companies in the peer group and any lessons learnt can then be applied throughout the rest of the sector. Robeco stresses the importance of active ownership and engagement with companies to improve their ESG performance.

What does Robeco need to move its approach to engagement on biodiversity to the next level?

Robeco says that data quality needs to be significantly improved in order to get an accurate portfolio overview. For example, it would be valuable if there was information on how firms measure their biodiversity footprint, how it has improved over the years and how their operations are effected by the state of biodiversity. Currently, there is no transparency in how firms measure their biodiversity performance.

How is Robeco accelerating the financing of pro-biodiversity innovation?

Highlighted by chapter 5, Robeco plays an important part in accelerating the financing of pro-biodiversity innovation. First of all, by conducting research for the Corporate Sustainability Assessment Robeco is building up in-house expertise on sectors that have a significant negative impact on biodiversity. This is supplemented by the sector deep dive which is conducted with various experts on the topic of biodiversity. This expertise is used to drive engagement with the companies that are most exposed.

7 Concluding Remarks and Next Steps

Financial institutions affect biodiversity while they are at the same time exposed to the financial risks associated with biodiversity loss. The first step to managing impact is understanding impact. We hope that this paper contributes to the understanding of the urgency of working on the reduction of biodiversity loss as humanity has already significantly altered 75% of the earth's land surface and 66% of the ocean area is experiencing negative impacts due to biodiversity loss (Díaz et al., 2019).

Financial institutions can contribute to reducing biodiversity loss by taking steps to start monitoring the impact on biodiversity from their own activities. The case studies have shown a number of different possibilities from integrating biodiversity criteria in investment processes to integrating biodiversity requirements in loan agreements. Additionally, financial institutions can contribute to bringing biodiversity policies of financial institutions to the next level through increasing company biodiversity data transparency, work on suitable investment instruments, methodological consistency in measuring biodiversity impacts, and by working on these topics together.

Moreover, financial institutions can make a conscious effort to finance pro-biodiversity projects. Financing pro-biodiversity projects can help alter the current trend of increasing biodiversity loss and together with conservation efforts potentially reverse this trend.

The working group biodiversity will continue to work to facilitate the dialogue on biodiversity impact measurement for financial institutions. The first next step by the working group biodiversity will be the publication of an explorative paper on deforestation monitoring and management tools.

As stated in the introduction, if we work together and learn from each other, finance can become an even larger driving force in securing a planet that can be enjoyed for generations to come. Join us!

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Key Definitions

Ecosystems: The dynamic process in which organisms (e.g animals, plants, insects and microbial life) interact as a functional unit, together with the non-living environment (OECD, 2019).

Biodiversity: According to the UN Convention on Biological Diversity (CBD), biodiversity is “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” (OECD, 2019, p. 19). Together, the construct of biodiversity is formed by two words; ‘biological’ and ‘diversity’.

Nature: Has a broad definition and encompasses, next to biological aspects such as biodiversity, also non-biological aspects such as soil and the weather (PBL, 2017a).

Ecosystem services: the direct and indirect services produced by organisms when interacting with their environment (TEEB, n.d.-b). Ecosystem services can be split into four different categories: provisioning, regulating, supporting and cultural services. Provisioning services include the production of food, raw materials (such as timber), fresh water and medicinal resources. Regulating services relate to the capacity of an ecosystem to regulate natural processes, such as carbon sequestration, biological control, pollination and prevent/reduce environmental risks, such as flooding and erosion. Many other beneficial processes, such as air quality control and waste water treatment, also fall under regulating services. Supporting services include the provision of habitats and the maintenance of genetic diversity. Cultural services are the ability of an ecosystem to provide value through recreational abilities, tourism, education and its positive contributions to mental health (TEEB, n.d.-a).

Natural capital: encompasses the total stock of renewable and non-renewable resources found in nature (OECD, 2019). As a result, ecosystems, biodiversity and ecosystem services are considered natural capital. Natural capital is comprised of the ‘**stock**’ of natural resources together with the ‘**flow**’ of environmental services they provide.

Planetary Boundaries: Planetary Boundaries is a framework with nine key planetary systems and sets limits, using the precautionary principle, at which humanity can operate without overstepping the system’s capacity (thresholds) (Steffen et al., 2015). The Planetary Boundaries distinguishes a green zone (safe), a yellow zone (increasing risk) and a red zone (high risk and beyond zone of uncertainty) (figure 4). We ideally want to stay within the green zone, where we know that the Earth can continue to provide essential services. Once a threshold is reached, or crossed, a system can ‘roll’ into an unstable state and rapidly deteriorate. This means the framework sets limits within which we must stay for humans to live in harmony on the planet and with the rest of nature. The boundaries delimit: climate change, ocean acidification, stratospheric ozone depletion, disruption of the nitrogen and phosphorus cycles, global freshwater use, land use changes, biodiversity loss, aerosol loading in the atmosphere, and chemical pollution.

Soil biodiversity: “the variation in soil life, from genes to communities, and the ecological complexes of which they are part, that is from soil micro-habitats to landscapes” (European Soil Data Centre, 2018)

Functional Biodiversity: any organism in an ecosystem that “pollinate, graze, pre- date, fix nitrogen, spread seeds, decompose, generate soils, modify water flows, opens up patches for reorganization and contributes to the

colonization of such patches". Functional biodiversity is vital for the provisioning of ecosystem services (Deutsch, Folke, & Skånberg, 2003).

