

Investing with Nature:  
Exploring Investment Opportunities  
Across Ecosystems

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# Primer 2: Nature-based Solutions in Oceans and Coastal Ecosystems

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The full Investing with Nature series can be viewed [here](#).



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# Introduction

Oceans and coastal ecosystems are home to a rich diversity of marine life and provide a range of ecosystem services that are crucial to human life and survival, including by supporting fisheries that provide food and livelihoods for millions of people around the world. Coastal ecosystems provide important tourism and recreational opportunities, while also supporting climate change mitigation through a high carbon sequestration rate, and helping climate change adaptation through coastal protection. According to the World Wildlife Fund (WWF), the goods and services provided by the ocean and coasts are worth at least USD 2.5 trillion annually, and the ocean as an asset is worth over 10 times that figure (WWF, 2015). However, these ecosystems are under threat due to a variety of factors including overfishing, pollution, climate change, and habitat destruction.

The degradation of oceans and coastal ecosystems is happening at an alarming rate. For example, it is estimated that over 90% of global fish stocks are either fully fished or overfished, and plastic pollution in the oceans is predicted to triple by 2040 (FAO, 2018; Pew Charitable Trusts and SYSTEMIQ, 2020).

To address these challenges, several international and national commitments have been made to restore and protect oceans and coastal ecosystems. The United Nations' Sustainable Development Goal (SDG) 14 aims to conserve and sustainably use the oceans and marine resources for sustainable development and includes targets such as reducing marine pollution and increasing the economic benefits of sustainable ocean use (United Nations, 2015). The Paris Agreement on climate change recognizes the important role of oceans in regulating the Earth's climate.

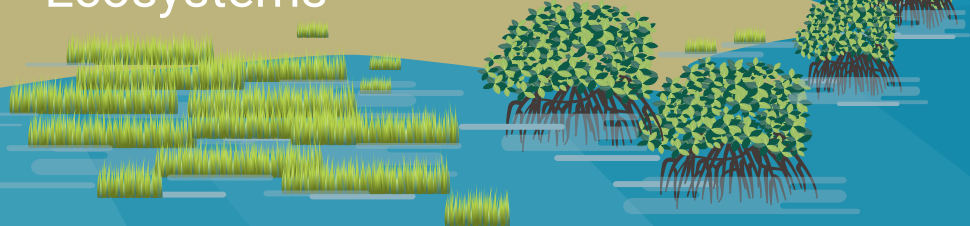
SDG 14 continues to be among the least funded SDGs with an annual financing gap of USD 149 billion per year. However, the financial sector is waking up to the risks arising from the degradation of oceans and coastal ecosystems as well as the investment opportunities in their conservation and protection. To support this process, the [Sustainable Blue Economy Finance Principles](#) (SBEFP) were developed. They are the world's first global guiding framework for banks, insurers, and investors to finance a sustainable blue economy. They promote the implementation of SDG 14 and set out ocean-specific guiding principles that support the financial industry to mainstream sustainability of ocean-based sectors (UNEP, 2022).

The health and preservation of oceans and coastal ecosystems are critical for both the environment and our economies. They require continued attention and action from governments, financial institutions, and companies alike. To provide relevant stakeholders with a concise introduction, this primer covers the importance of coastal and marine ecosystems, their relevance to the financial sector, environmental and social safeguards, and recommendations for financial institutions.

The primer is a part of the '[Investing with Nature: Exploring Investment Opportunities Across Ecosystems](#)' series, born with funding from the German Federal Ministry for Economic Cooperation and Development (BMZ) and with support from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. It is preceded by the first primer introducing Nature-based Solutions (NbS), which can be found [here](#). These primers accompany a webinar series, and the webinar for marine and coastal ecosystems can be found [here](#).

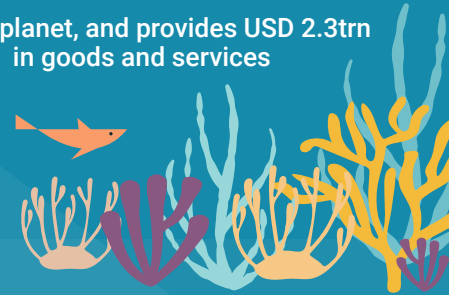


# Nature Based Solutions in Oceans and Coastal Ecosystems



THE OCEAN COVERS 70% OF THE  
 EARTH'S SURFACE,  
**HOSTS 80% OF  
 ALL LIFE**

on this planet, and provides USD 2.3trn  
 in goods and services



## SERVICES the ecosystem provides

**CORAL REEFS**  
 offer  
**63 MILLION PEOPLE**  
 with coastal  
 protection globally

**MANGROVES**  
**REDUCE 66%**  
 of wave height—  
**EASING EROSION AND  
 FLOOD RISK**

**COASTAL WETLANDS**  
 can offset burning  
**1 BILLION  
 BARRELS OF OIL**  
 annually through CO<sub>2</sub> sequestration

## Relevance to **FINANCIAL INSTITUTIONS**

**MARINE NBS RECEIVE ONLY 9%**  
 of NbS investment, hindering the ocean's  
**CLIMATE MITIGATION,  
 ADAPTATION, and  
 CONSERVATION ROLE**

Economic risks of a business-as-  
 usual approach toward oceans  
 involve a cost of up to  
**USD 8.4TRN**  
**OVER THE NEXT 15 YEARS**

**MANGROVE RESTORATION,  
 AQUACULTURE, and  
 SUSTAINABLE FISH FEED**  
 provide opportunities for investment in  
**OCEAN AND COASTAL HEALTH**

## BENEFITS OF INVESTING in this ecosystem

Global investment of **USD 11.1BN** in  
**MANGROVE RESTORATION,**  
 a key carbon sink, could result in  
**USD 11.8BN  
 IN PROFIT**

Investing in  
**CORAL REEF  
 and MANGROVE  
 RESTORATION** improves  
**FLOOD PROTECTION** and  
**FOOD SOURCES**

Sustainable ocean-based investment  
 yields benefits  
**5X GREATER THAN COSTS,  
 HIGHLIGHTING A  
 SIGNIFICANT ECONOMIC  
 OPPORTUNITY**

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# Why are NbS in oceans and coastal ecosystems important?

There is growing recognition of the importance of NbS in restoring and protecting oceans and coastal ecosystems. Coastal ecosystems, such as mangroves, salt marshes, and seagrass beds, provide a range of important ecosystem services. These include coastal protection, erosion control, and storm surge attenuation, which can help to mitigate the impacts of climate change and extreme weather events. In addition, these ecosystems provide nursery grounds for fish and other marine organisms, supporting important fishery and aquaculture industries. The degradation of these ecosystems can have significant economic implications for financial institutions, with losses from infrastructure and marine investments, increasing insurance covers and payouts, loss of resources like coral reefs for certain industries like tourism, fishing, and even pharmaceuticals, and lower profitability of businesses invested in tourism.

Examples of NbS in these ecosystems include protection, management, conservation, and restoration of mangroves, coral reefs, and seagrass beds, effective management of marine protected areas, and the implementation of green infrastructure in coastal cities to provide natural coastal protection. These NbS aim to protect, manage, and restore natural and modified ecosystems in ways that address societal challenges (e.g., improving water quality and food security, supporting climate change mitigation and adaptation), provide human well-being, and have biodiversity benefits (IUCN, 2016).

For example, the World Bank (2016) conducted research on large-scale mangrove conservation and restoration in Indonesia. Beyond demonstrating the benefits for society and the environment, the study found that these efforts provide significant economic benefits. On average, the study estimates ecosystem services worth USD 15,000/ha per year, arising from improved coastal protection, climate regulation, fisheries support services, raw materials provision, and cultural services. This is contrasted with average restoration costs of about USD 3,900/ha and opportunity costs of USD 3,400/ha in areas that could be converted into commercial agriculture or aquaculture.

Broadly speaking, within the rubric of NbS there is a spectrum for levels of interaction and modification of nature by society ([UNEP, 2022](#)). Some marine examples of nature-based infrastructure can be seen below. Figure 1a showcases the Living Seawall project in Australia's Sydney Harbour, providing an example of green ecosystem solutions, and figures 1b and 1c show examples of nature-based infrastructure, where room is given back to nature, e.g., to reduce flood risk.



**Figure 1:** Examples of NbS projects worldwide; (A) The Living Seawall project in Australia’s Sydney Harbour, (B) the Medmerry scheme for coastal realignment, Sussex, UK, (C) construction of hybrid dunes in Barcelona for urban coastal defence.



### **Case study: Earth Security and HSBC mangrove bond (UNEP, 2022)**

In Australia, the commercial bank HSBC is working with Earth Security to develop a template for their concept of a 'mangrove bond' to finance mangrove conservation and restoration (Earth Security 2021b). This follows Earth Security's 2021 analysis translating the values of mangrove as NbS into an investable asset, which was co-funded by HSBC among other partners (Earth Security 2021a). The framework explores the use of green bonds to raise capital for climate adaptation, fisheries, and blue carbon opportunities, exploring its application to current modes of green finance by regional governments. The concept builds on the precedent of municipal bonds for coastal adaptation in the United States and Scandinavia, for example the 2017 Miami Forever Bond, which raised USD 400 million to finance projects to combat sea level rise and flooding, allocating USD 192 million towards green-grey infrastructure, including mangrove protecting and restoration. This more recent concept seeks to strengthen the focus of these instruments on the underlying value of nature-based solutions.

Earth Security intends to use the resulting framework to scale the concept across multiple mangrove-rich countries and is developing a global financing initiative to drive its replication. Bonds typically work for large-scale financing of USD 50 million and above, whereas mangrove conservation efforts and projects are typically well below this threshold. To bridge this gap, a series of aggregation models are being explored, from pooling projects with other types of green investments, to aggregating projects across multiple local and regional governments, in order to spread risks for investors while extending finance across multiple geographic locations.

## **The finance gap and financing the sector**

NbS play a key role in the global response to address the triple planetary crisis of climate change, biodiversity loss, and pollution. Financing them, in turn, is indispensable. To leverage NbS in the fight against climate change and biodiversity loss, it is key to enable financial institutions to develop a global financial landscape for financing NbS.

This has not been achieved so far, despite the economic and financial benefits estimated to arise from NbS in marine and coastal ecosystems. The Global Commission on Adaptation estimates that protecting and restoring mangroves globally would cost less than USD 100 billion and could create USD 1 trillion in net benefits by 2030. The UN calculates that investing USD 6 billion p.a. in nature-based disaster risk management activities like restoring coastal ecosystems would result in savings of up to USD 360 billion over the next 15 years (UNFCCC, 2021). Further, these solutions can bring financial benefits as they are often cheaper than other approaches. For instance, nature-based infrastructure may be up to 50% cheaper than traditional infrastructure even when providing the same service (IISD, 2021). These cost savings are primarily due to lower maintenance costs and capital associated with nature-based and green infrastructure. For example, restoring wetlands to provide water filtration services may be less expensive than building and maintaining a water treatment plant. Overall, investing in NbS in marine and coastal

ecosystems can provide a cost-effective and sustainable approach to address the multiple challenges we currently face.

In addition to the adaptation capacities of NbS which can be utilised by investing in NbS for disaster risk reduction and coastal protection, utilising marine and coastal NbS for climate mitigation is also a huge opportunity. Coastal ecosystems of mangroves, tidal marshes, and seagrass meadows sequester and store significant amounts of coastal [blue carbon](#) from the atmosphere and ocean. The potential for climate mitigation is immense as mangrove and other blue carbon ecosystems can sequester 10 times more carbon than boreal, temperate or tropical forests (NOAA, 2022). Financing blue carbon ecosystems can be done through various mechanisms including blended finance structures, blue bonds, or carbon offsetting through compliance markets or voluntary carbon markets. Such projects must make sure to address criticisms surrounding blue carbon, such as the environmental quality of the project, conflicts of interests with local stakeholders, and climate justice issues. In this respect, project developers and financial institutions can, for example, make use of the High-Quality Blue Carbon Principles and Guidance ([Conservation International et al., 2022](#)).

Regardless of the ocean's importance, its protection, management, and restoration are largely underfunded. Of the USD 154 billion invested in NbS in 2022 only 9% is dedicated to marine ecosystems (UNEP, 2022). This pales in comparison to investments in terrestrial protected areas. While USD 1 billion flows into marine protected areas annually, their terrestrial counterparts receive almost USD 22 billion. The annual finance gap to increase marine protected areas to 30% by 2030, as agreed in the Kunming-Montreal Global Biodiversity Framework, is approximately USD 8–11 billion ([UNEP, 2022](#)).

## Blended finance

Blended finance can be an effective vehicle to facilitate capital flows and scaling up solutions. In a [Finance Earth \(2021\)](#) report, 88 projects were identified based on project's that meet NbS criteria based on IUCN's definition, and where repayable investments were wholly or partially provided by financial institutions or corporate investors. It was found that almost half the projects used grant capital to de-risk private finance and enhance investor returns. Given that concessionary capital currently dominates the NBS financing market, reframing the pipeline to de-risk larger private funds could be a significant opportunity for NBS moving forward.

Coastal infrastructure is often developed and financed by the public sector. However, there are several ways in which private finance can interact with the public sector on coastal infrastructure (Bisaro and Hinkel, 2018). These include:

- public-private partnerships in the form of long-term contracting (especially relevant for institutional investors);
- private provisioning of public ecosystem services by listed equity investors;
- taking minority shares in state-owned enterprises (relevant for listed equity investors) (UNEP, 2022).

## Case study: Seychelles Blue Bond



Figure 2: Graphic by the World Bank

Blended finance in practice can be seen through the issuance of blue bonds in emerging economies. One such example is the first sovereign blue bond issuance by Seychelles in 2018, which raised USD 15 million from impact investors and was aimed at financing sustainable marine and fisheries projects in the country. The World Bank issued a repayment guarantee of USD 5 million, which reduced the country's borrowing cost by 2% annually, in addition to which GEF also provided USD 5 million in concessional funding, which further reduced the borrowing cost by over 3% per year. This innovative financing package helped the Seychelles' government save over USD 8 million in interest charges over the next ten years (World Bank, 2018).

## Environmental and social safeguards

Financial institutions looking to invest into the NbS space also need to be cognizant of the specific risks and challenges associated with the marine and coastal ecosystems. These risks can be in the form of environmental risks, such as the vulnerability of coastal and marine ecosystems to environmental stressors, such as ocean acidification, sea level rise, and increasing water temperatures, unsustainable use (fishing, tourism, shipping, oil and gas extraction, etc) or social risks, such as potential for conflicts over resource use and the displacement of vulnerable communities. The incidence and severity of such risks can affect the viability and success of NbS projects, and it is thus crucial to take preventative measures to avoid these challenges. For example, most nature-based interventions in natural or semi-natural ecosystems were reported to have ameliorated adverse climate impacts (Chausson *et al.*, 2020).

As part of their risk mitigation strategies, FI's can refer to international sustainability standards such as the [IUCN Global Standard for Nature-based Solutions](#) and the [Gold Standard](#). These standards provide frameworks for ensuring environmental and social rigor in NbS projects, including components and criterion for stakeholder engagement, project design and implementation, and monitoring and evaluation. Examples of violations that investors should be aware of include the exploitation of vulnerable societies and communities, non-engagement with Indigenous People's and Local Communities (IPLCs) in project planning and implementation, failure to consider and mitigate negative impacts on marine biodiversity and ecosystems such as the destruction of critical habitats of mangroves and coral reefs, as well as lack of long-term project sustainability planning beyond the project duration scope.

# Recommendations

To support financial institutions as they begin their journey in marine and coastal investments, below are a number of recommendations that complement previous recommendations made by The State of Finance for Nature ([UNEP, 2021](#)).

- 1.** Build capacity within financial institutions to identify opportunities and overcome barriers. Ensure clarity on which NbS type is bankable and what requires further innovation:
  - a.** For projects with clear revenue/cost saving potential, bankability is comparatively high for the private sector and opportunities can be surfaced
  - b.** For other projects, the public sector must continue to remain a key player, by providing incentives, providing information and data e.g., on valuing carbon sequestration, and being the entry points for commercial finance to engage creatively—e.g., through blue carbon
  - c.** Knowledge sharing and practical studies on investment and insurance practices for NbS are required, including collaborations with academia, participation in sector initiatives, and shared learnings;
  - d.** Set a capacity-building roadmap for your institution on nature from both an opportunity and risk point of view.
- 2.** For marine and coastal NbS, leverage existing frameworks, tools, and initiatives, including the Sustainable Blue Economy Finance Initiative. UNEP’s Diving Deep Guidance recommendations, published in 2022, specifically provide clear guidelines and recommendations for financial institutions to invest in coastal resilience, through infrastructure and NbS, building on existing approaches to grasp NbS opportunities. In addition:
  - a.** More exchanges with the scientific community are often expressed as necessary by the insurers/reinsurers in integrating NbS and operationalizing insurance value of ecosystems ([Marchal et al., 2019](#));
  - b.** More and enhanced partnership with governments and regulators is important as government’s participation would share insurable interest and solve public goods and some of free-riders’ problems ([Kousky et al., 2019](#)).
- 3.** Localize NbS wherever possible—tailor to local environments, use local species, rely on local expertise.
- 4.** For insurers: shift the focus on nature and risk from ex-post responses to ex-ante mitigation measures. This requires a shift in focus on underwriting and investing more in conservation and ecosystem restoration, including NbS, rather than providing business as usual services to businesses that focus on disaster risk reduction.

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UNEP Finance Initiative brings together a large network of banks, insurers and investors that collectively catalyses action across the financial system to deliver more sustainable global economies. For more than 30 years the initiative has been connecting the UN with financial institutions from around the world to shape the sustainable finance agenda. We've established the world's foremost sustainability frameworks that help the finance industry address global environmental, social and governance (ESG) challenges.

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