

# INVESTING IN NATURE AS INFRASTRUCTURE

THE OPPORTUNITY

October 2024



ASIAN INFRASTRUCTURE  
INVESTMENT BANK

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**Investing in Nature as Infrastructure  
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## Abbreviations

ACS	Asia Climate Solutions
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
ART	Architecture for REDD+ Transactions
DSNG	Dharma Satya Nusantara Tbk
EMDE	Emerging Markets and Developing Economies
GBF	Kunming-Montreal Global Biodiversity Framework
IPLC	Indigenous Peoples and Local Communities
KPI	Key Performance Indicators
MDB	multilateral development bank
NBS	nature-based solutions
NBSAP	National Biodiversity Strategy and Action Plan
NAI	Nature as Infrastructure
NBS	nature-based solutions
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SPV	Special Purpose Vehicle
TNC	The Nature Conservancy
TREES	The REDD+ Environment Excellence Standard
UNEP-FI	United Nations Environment Programme – Finance Initiative
UNFCCC	United Nations Framework Convention on Climate Change

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## Executive Summary

The dual crises of climate change and biodiversity loss continue to be in the spotlight. Increasingly, it is accepted that the crises are inextricably linked, and that to solve either crisis effectively, both must be addressed together.

The Kunming-Montreal Global Biodiversity Framework (GBF) sets the stage for a decade of action on nature and biodiversity, with clear goals and targets including for financing nature and addressing the [USD700 billion gap in annual biodiversity funding](#) between now and 2030. While there are still many challenges to overcome regarding financing nature and biodiversity, the GBF gives a clear framework to align to. Integrating biodiversity into infrastructure project-level decision making can help governments achieve Global Biodiversity Framework Targets including protecting 30% of land and seas by 2030.

There is a fast-developing market for financing nature with expectations for this to grow significantly over the coming decade as governments respond to the GBF through their National Biodiversity Strategy and Action Plans (NBSAPs). The innovative public and private financing tools that are being used to finance NBSAPs and more broadly, natural ecosystems and the biodiversity therein, are explored in this report.

The Asian Infrastructure Investment Bank (AIIB) has made progress on its journey to explore Nature as Infrastructure (NAI), a concept formulated in its Asian Infrastructure Finance 2023 report [Nature as Infrastructure](#). Having started the journey by incorporating nature-based solutions (NBS) into its infrastructure projects, the next step is to incubate standalone NAI investment opportunities.

This report presents high level opportunities for investing in nature as infrastructure by using innovative financing instruments. It is intended as a high-level guide to set the direction and build momentum—particularly among multilateral development banks (MDBs)—of investments in NAI. It is not intended to provide in depth guidance on implementing such investments. Rather, it shows that by demonstrating the financial feasibility, impact and scalability of investing in NAI through proof-of-concept projects, MDBs, including AIIB, can work to mobilize private capital towards green infrastructure with climate change and biodiversity co-benefits, and to play a role in promoting greater regional and global attention and action for nature.

## I. Scale of the Biodiversity Crisis

The world is experiencing an unprecedented dual crises of climate change and biodiversity loss. It has long been reported that we are in the midst of the sixth mass extinction. The World Wildlife Fund's [2024 Living Planet Report](#) details an average 73% decline in wildlife populations since 1970. Tropical forests are under extreme threat from continued deforestation, and considering they hold 90% of the world's biodiversity, this is a critical issue in itself.

The top five drivers for this biodiversity loss are:

- Change of land use
- Climate change
- Direct exploitation of organisms
- Pollution
- Invasive alien species

While the climate crisis has been much more in the focus recently, it is not just the scientific case for biodiversity protection, but also the economic case that is compelling. A [2023 report by PwC](#) shows that 55% of global GDP, or USD58 trillion, is moderately or highly dependent on nature and the eco-system services it provides.

The Asia-Pacific region counts Australia, China, Indonesia, Malaysia, Papua New Guinea, and the Philippines among its six megadiverse countries. However, according to the World Wildlife Fund, [Asia Pacific has already lost 55% of its biodiversity](#), making this region particularly vulnerable to the effects of further biodiversity loss.

Among this nature and biodiversity are examples which provide vital infrastructure services, such as coral reefs and mangrove forests for coastal protection, wetlands for watershed services, and rainforests as critical carbon sinks, not to mention the diversity of species that all these contain, and the multiple ways they benefit people and the planet.

Furthermore, the nature and climate crises are intrinsically linked. Nature-based climate solutions—such as forest conservation, restoration and land management actions—can help to increase carbon storage and avoid greenhouse gas emissions, providing one-third of the mitigation needed by 2030, [according to The Nature Conservancy](#) (TNC). Solving the nature crisis can have co-benefits to climate mitigation and adaptation as well as biodiversity conservation. At the same time, the land footprint of clean energy infrastructure—a key part of the solution to climate change mitigation—can be at least 12 times that of traditional energy developments, [according to TNC India](#). As such, even the location of clean energy infrastructure requires careful consideration to ensure the solutions to climate change do not exacerbate the risks of biodiversity loss. Such interlinkages call for an integrated approach to effectively manage co-benefits and trade-offs.



## II. International Policy Debate and Major Developments

In what is arguably one of the biggest breakthroughs in addressing climate change and biodiversity loss to date, thanks to the United Nations Framework Convention on Climate Change (UNFCCC) [COP27](#) and the United Nations Convention on Biological Diversity (UNCBD) [COP15](#) in 2022, there is now unequivocal scientific recognition and political consensus that biodiversity loss and climate change are two sides of the same coin and must be addressed together if we are to be able to meaningfully respond to either crisis. [SDG 13: Climate action](#), [SDG 14: Life below water](#) and [SDG15: Life on land](#) are among the 17 SDGs to be achieved by 2030.

The 2022 landmark [Kunming-Montreal Global Biodiversity Framework](#) (GBF) has moved the needle for biodiversity loss, from being a peripheral issue to placing it at the centre of decisionmakers' attention. At the [Summit on a New Global Financing Pact](#) held in Paris in June 2023, heads of states, multilateral development banks (MDBs) and international organizations [called for a transition towards a net zero and biodiversity positive world](#).

This means that biodiversity will become a non-negotiable as climate is now. The two should be integrated to make better investment decisions for organizations like the Asian Infrastructure Investment Bank (AIIB). Indeed, it is well documented that nature-based solutions are a significant part of the solution for the twin crises of climate change and biodiversity loss, with calls for scaled up investment for nature-based solutions (NBS) to enable this at USD674 billion per year compared to USD154 billion at present.

Fortunately, there is a pathway for halting and reversing biodiversity loss. The GBF is providing significant momentum in both the public and private spheres, setting the stage for scaling up biodiversity financing. Similar to the experience following the [Paris Agreement](#) on climate, countries will begin to set regulations and laws aimed at implementing the four goals and 23 targets of the Framework, with implications across all sectors and segments of the economy. These will be in the form of National Biodiversity Strategies and Actions Plans (NBSAPs), the equivalent of the UNFCCC Nationally Determined Contributions (NDCs).

Specifically in the banking sector, the United Nations Environment Programme Finance Initiative (UNEP-FI) states that the GBF provides direct encouragement to banks to innovate new products that create returns from nature-related revenue streams to help mobilize the USD200 billion per year needed to meet the GBF's objective. The [finance solutions proposed](#) include blended finance; sovereign lending, debt for nature conversions, impact finance; green and blue bonds.

Below are the most relevant goals and targets from the perspective of financial institutions:

- **Target 14** which calls for **policies and regulations to create an enabling environment** for the alignment of private and public financial flows to ensure that financial institutions and businesses start aligning their activities across all sectors with the goals and targets of the GBF.
- **Target 15** which calls for large businesses and financial institutions to regularly monitor, assess and fully and transparently disclose **risks, dependencies and impacts on biodiversity**, along their operations, value chains and portfolios, with the aim of reducing negative impacts on biodiversity and increasing positive impacts.

- **Target 19** which requires an increase of the level of **financial resources** from all sources in an effective, timely and easily accessible manner, including domestic, international, public and private resources and mobilizing at least USD200 billion per year by 2030, including by *“Increasing total biodiversity related international financial resources from developed countries, including official development assistance, and from countries that voluntarily assume obligations of developed country Parties, to developing countries, in particular the least developed countries and small island developing States, as well as countries with economies in transition, to at least USD20 billion per year by 2025, and to at least USD30 billion per year by 2030.”*

Among the four goals of the GBF, **Goal D** on means of implementation is critical to MDBs and calls for *“[progressively closing the biodiversity finance gap of 700 billion dollars per year and aligning financial flows with the Kunming-Montreal Global Biodiversity Framework and the 2050 Vision for Biodiversity](#)”*. The next chapter will highlight some challenges to making this happen.

### **Case Study No. 1. Development of a National Enabling Policy Environment and Capacity to Recognize the Value of Natural Capital**

#### ***A national enabling policy environment and capacity is important to recognize the value of natural capital***

To implement the global targets and goals under the [Kunming-Montreal Global Biodiversity Framework](#), countries will need to develop national strategies and plans, signal high-level leadership behind priorities of nature and biodiversity conservation, and create an environment with enabling policies and market conditions to attract financing at scale. Below are three examples:

- Under the Natural Capital Project at Stanford University, the Inter-American Development Bank, Asian Development Bank and World Bank Group are working with 10 pilot countries<sup>a</sup> on a 15-month pilot to support the countries to use natural capital information to design and inform policy and finance decisions. The process shows the values nature provides to people—such as clean air and water, fertile soil, rich ocean life, flood protection, heat protection, and carbon capture—allowing these services to be factored into land, water, and ocean use policies and investment decisions. The Natural Capital Project and multilateral development banks will work with the pilot countries to co-develop natural capital approaches that inform specific policy or finance decisions, and further develop capacity for using them.<sup>b</sup>
- In September 2022, under its “Ecological Red Lines” policy,<sup>c</sup> the government of China announced that the establishment of national parks and the restoration of ecosystems had helped to bring the total area under protection to more than 30% of its territory. The policy aims to limit human activities in areas that maintain ecological security and provide essential ecosystem services, such as soil and water conservation, biodiversity protection, wind protection, sand fixation, and coastal ecosystem stabilization, as well as control of soil erosion, desertification,

and soil salinization in ecologically vulnerable areas. Going forward, China's Master Plan for National Key Ecosystem Protection and Restoration Major Projects (2021-2035) has laid out further plans for conservation and restoration.

- Under the United Kingdom's biodiversity net gain law, mandatory biodiversity net gain aims to secure positive outcomes for biodiversity, improving the planning process for developers, and creating better places for local communities. Implemented through the planning system, biodiversity net gain will require most substantive development to achieve at least a 10% net gain in biodiversity compared to pre-development values. Gains and losses will be measured in the form of biodiversity units, with landowners and managers able to create or enhance habitat to generate these units.<sup>d</sup> The UK's biodiversity net gain law represents an emerging trend which other governments may choose to implement.

Sources:

<sup>a</sup> Armenia, Belize, Chile, China, Colombia, Cook Islands, Ecuador, the Philippines, Sri Lanka, and Uruguay

<sup>b</sup> [Global Forum Kicks Off New Project to Mainstream Nature in Decision-Making | Natural Capital Project \(stanford.edu\)](#)

<sup>c</sup> [One-third of China's Land Protected Under Ecological 'Red Line' Scheme](#)

<sup>d</sup> [Microsoft Word - Natural capital - discussion paper \(ukib.org.uk\)](#)

### III. Barriers to Nature and Biodiversity Financing

#### *General Challenges to Investing in Nature-based Solutions*

While this paper focuses largely on opportunities, it is important to note the following general challenges to investing in nature-based solutions (NBS). There is a role for MDBs—as a bridge between public and private financing—to help overcome these barriers by contributing knowledge, derisking investments and mobilizing further funding.

- **Valuing nature** is inherently complex and while there are several established and new methodologies for this, both capacity and awareness are lacking. Putting an economic value on these goods and ecosystem services can help to inform decisionmakers to prioritise investments in nature-positive solutions. AIIB's 2023 Asian Infrastructure Finance report on [Nature as Infrastructure](#) demonstrated how to do so in line with the European Bank for Reconstruction and Development and peer MDBs' evaluation methods under development. In addition to demonstrating the economic value, and of particular relevance when seeking to mobilize private capital, the financial value of such investments needs to be established and understood. Examples include revenue streams such as those from ecotourism or carbon credits, and cost savings given that the long-term costs of natural infrastructure are often lower due to lower maintenance costs.
- **Investment amounts are generally small**, can be **complex** and come at a **high cost**. Finding comparable data can be difficult given many projects are financed by a combination of different instruments. Accordingly, the complexity of some of the financing arrangements can result in high cost.
- **Investment horizons can be very long** which can be a barrier for some financial institutions.
- There is a **lack of standardization and regulation** which adds to the complexity. Taxonomies on nature are under development, including through the joint MDB working group (which was set up to scale action on nature and biodiversity), and without these it can be challenging for investors to align.
- As noted in the European Investment Bank's [June 2023 report on NBS](#), the technical and political environment tends to show a **bias toward grey infrastructure** as the default option over NBS, even when NBS alternatives may prove to be more cost effective.
- The potential for **private capital** to be part of the solution to closing the biodiversity financing gap is potentially immense, though currently **under-utilized** while government policies are formed to align to the goals and targets of the GBF. There are multiple opportunities for MDBs to create the enabling environments to allow greater mobilization of private capital through de-risking financing and focusing on areas which meet the needs of the private sector, including leading organisations keen to act now. According to a 2020 study, [Financing Nature: Closing the Global Biodiversity Financing Gap](#), the alignment of all private and public sector flows would enable funding in the tens of trillions of dollars.
- **Nature-based solutions** (namely, ecosystem protection, ecosystem management and improved management of farmland) are among the most promising strategies for reducing carbon emissions, [yet they are vastly underfunded and need to more than triple by 2030 to USD484 billion to meet climate and biodiversity goals](#). In contrast, the volume of climate finance is much larger. Returns to investments in low-carbon transport, renewable energy and energy efficiency are attractive and becoming well understood by development

finance institutions, commercial banks, investment banks and institutional investors. [This is not yet the case for nature-based solution investments.](#)

#### IV. Link to Infrastructure Development

The Asia Pacific region continues to experience rapid development, with [predicted infrastructure demand over the next 20-30 years, making up over half of the expected USD94 trillion of infrastructure investment needed globally](#). Meanwhile, the World Economic Forum has [estimated that 29% of threats to biodiversity are linked to infrastructure development](#). While investing in infrastructure is critical for development, it must be done with the appropriate safeguards in place.

Managed well, there is the opportunity to not only minimize the negative impacts on biodiversity of this development through implementation of relevant safeguards, but to also make a positive impact by incorporating nature-based solutions into infrastructure planning.

Nature as infrastructure (NAI) can be understood from two different perspectives. Taken at the broadest level, nature can be considered as the infrastructure of life. All life on earth depends on nature and the ecosystem services it provides. One hundred percent of the world's economy is dependent on nature in some way. As presented in AIIB's 2023 [Asian Infrastructure Finance report](#),

*“Nature as infrastructure has the potential to be a transformative concept for development. It goes beyond nature-based solutions or mitigating the impact of human development on nature. Infrastructure is traditionally defined as the organizational structures and facilities that allow for the operation of society. It should now be clear that nature is an inseparable part of it. (p. xx)”*

From a technical perspective, nature as infrastructure, as a sub-set of NBS, can be thought of as the strategic use of largely or entirely natural solutions to address infrastructure needs that would otherwise be addressed using conventional or engineered infrastructure. Examples include coastal mangrove reforestation instead of using seawalls for coastline erosion protection, coral reef conservation and restoration as reducers of wave energy, and the restoration and construction of wetlands to purify water—and as a flood sink—instead of water treatment plants or constructed flood barriers.

Going a step further to classify and then finance nature as infrastructure is perhaps the biggest opportunity for making simultaneous positive impacts on biodiversity conservation and climate change mitigation and adaptation, given the ecosystem services that nature can provide. **The Paulson Institute [found that in 2019, some 20% \(USD27 billion\) of global financial flows going to biodiversity conservation came from natural infrastructure and that this could rise to up to USD138 billion in 2030.](#)**

**The Institute for International Sustainable Development has found that nature-based infrastructure can provide equally effective and more resilient infrastructure at 50% the cost of grey infrastructure, while also providing 28% more value add (USD489 billion per year).** A clear understanding of this point may support buy-in to the concept, and efforts to scale up and replicate pilot projects in financing nature-based infrastructure.

There is considerable scope to drive positive impact by developing infrastructure investments with nature as infrastructure being a key focus.

## V. **Scaling Financing for Nature as Infrastructure**

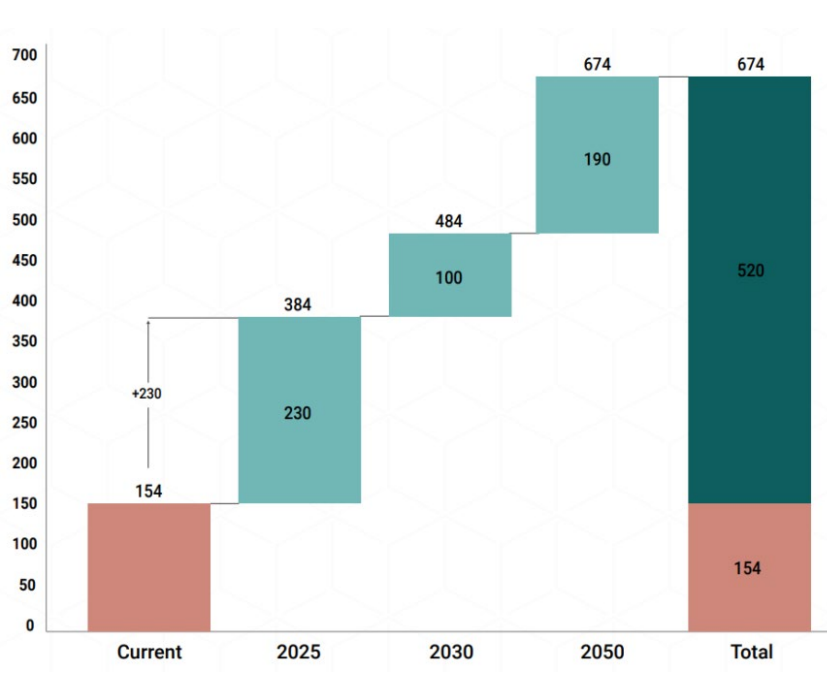
Scaling financing for nature as infrastructure requires two steps—an engineering step and a financing step.

Enabling conditions for nature as infrastructure should be developed to allow for tangible business opportunities to replicate and scale up initial successful experience in pilot NBS projects. First, from an engineering perspective, a catalogue of key sectors and sub-sectors as well as infrastructure functions that can be fulfilled by natural infrastructure (e.g., mangroves, coral reefs, wetlands) could be used as a reference in pipeline development.

Second, innovative financing instruments can be used to mobilize private capital. The following chapter presents potential opportunities to finance NAI. These have been selected for presentation based on the market potential for each instrument and the potential to demonstrate impact through action.

## VI. Market Scan of Nature and Biodiversity Finance and Related Nature as Infrastructure Financing Opportunities

**Figure. Trajectory of Annual Investment Needs in Nature-Based Solutions**



The trajectory of annual investment needs in nature-based solutions to limit climate change to below 1.5°C, halt biodiversity loss and achieve land degradation neutrality, USD billion (2022). Amounts in pink indicate existing financing.

Source: [State of Finance for Nature 2022 | UNEP - UN Environment Programme](#).

### *Opportunities for Nature and Biodiversity Financing*

While challenges exist, this chapter will show there is a strong expectation for nature finance to grow significantly in the coming years to meet the annual investment needs in nature-based solutions to limit climate change to below 1.5°C and halt biodiversity loss (see Figure). However, before such financing growth can occur, the investment case for financing nature, including NAI, must be better established. In this regard MDBs have a crucial role to play through demonstrating the financial viability through successful examples.

There are multiple financing structures, both well-known and innovative, that MDBs could employ to crowd in private financing. The following section presents financial instruments used to finance biodiversity and nature conservation along with an indication of market size and the NAI financing opportunity. This analysis is not limited to nature-based infrastructure, and all examples serve as inspiration for considering the financing of nature-based infrastructure or natural infrastructure projects. This section covers the following instruments:

- (1) Nature and biodiversity loans
- (2) Nature and biodiversity bonds



- (3) Debt for nature swaps
- (4) Sustainability linked loans/ Performance linked loans
- (5) Nature-based carbon credits
- (6) Blended finance

## 1. Nature and Biodiversity Loans

Proceeds from green loans can finance assets and projects with positive nature and biodiversity outcomes. Pricing on green loans can be attractive to borrowers compared to a traditional loan on the basis that a green asset may be more economically efficient than a traditional asset. For example, a green building with nature-based solutions may have lower heating and cooling costs associated with its maintenance compared to a conventional building, resulting in a reduced risk of default on the part of the green borrower and therefore lower borrowing costs.

### Case Study No. 2. China: Pledge Loan to Fund Improved Outcomes Through Nature-based Solutions

The Asian Development Bank (ADB) provided a loan of USD150 million to the Government of China for the Jiangxi Pingxiang Integrated Rural-Urban Infrastructure Development Project, seeking to improve urban sewerage and prevent flooding through nature-based solutions. The project, led by the Municipality of Pingxiang, supported river and wetlands rehabilitation and wastewater treatment. In 2016, the government signed the loan agreement with ADB with a repayment period of 20 years.

In August 2021, Industrial Bank's Nanchang Branch and the Environment Exchange jointly granted an RMB10 million China carbon emissions reduction carbon sink loan to Jiangxi Fenglin Investment & Development Co., Ltd., the first pledge loan of this kind in Jiangxi Province. The loan would be used to develop and operate forestry carbon sink projects, which will not only "awaken" the "sleeping green assets", but also meet the company's financing needs, while the yields will also be spent on carbon sink projects, generating great ecological, economic and social benefits."

Source: [Industrial Bank 2021 Annual Sustainability Report](#)

Related NAI financing opportunity: [Natural infrastructure sovereign loan](#)

**Sovereign loans** are tried and tested instruments and so may be a sensible place to add a focus on loans to finance the conservation, maintenance or restoration of natural infrastructure. Loans could also be used to finance NBS as part of green-grey infrastructure projects. With the right knowledge, feasible solutions in given sectors could be identified during early project discussions to increase the likelihood of nature-based solutions being used for or as a component of infrastructure projects. Sovereign lending may also be better suited to financing projects intended to demonstrate proof of concept.

There are already precedents for projects using NBS in MDBs including AIIB's sovereign project pipeline and portfolio. AIIB's pipeline projects include ones which focus on the restoration and conservation of natural ecosystems as well as the including natural assets into projects to enhance or replace the operating functions provided by grey infrastructure. The following cases illustrate this well: (i) the Guangxi Beihai Lianzhou Bay Marine Ecological Restoration and Protection project, in China, incorporates a mangrove restoration and conservation component to protect the coastal areas from natural hazards, and establish a "blue carbon" storage for climate resilience; (ii) the Inner Mongolia Ulanhot Green and Climate Resilient Urban Development Project, in China, includes a component aiming to restore riparian area along the Tao'er River and wetlands to further enhance ecological and biodiversity conservation as well as increase the natural water storage capacity of the basin to reduce flood and waterlogging risks which could be exacerbated by climate change. All of them present an excellent opportunity to pilot NBS and be replicated elsewhere.

In addition to sovereign loans, it may be possible also to work with private sector borrowers to incentivize nature-based solutions in infrastructure, where loans could be made to private entities which then pay back the cost of investment through savings or avoided costs brought about by NBS.

## 2. Nature and Biodiversity Bonds

The [market size of nature-related green bonds is estimated](#) at USD1.4 billion—USD2.7 billion (0.5%-1% of total green bond market USD271 billion) in 2019 and USD11.8—USD44.8 billion (still only 1%-4% of the total green bond market USD1,120 billion) by 2030. Green bonds are widely known as a debt instrument whose proceeds are tagged for climate and environmental projects. While this is currently an underutilized instrument, there is clearly potential to grow this [given investor interest in nature](#).

Biodiversity and sustainable land use are addressed under two [Green Bonds Principles](#) categories:

- Terrestrial and aquatic biodiversity conservation (including the protection of coastal, marine and watershed environments)
- Environmentally sustainable management of living natural resources and land use.

Nature and biodiversity related green bonds are not yet as established as green bonds linked to the energy sector, for example. According to the Paulson Institute, they represent only 0.5-1% of the total green bond market. One reason for this is that, unlike climate investments in the energy sector, biodiversity investments lack a clear revenue stream, whereas renewable power would be an example of a revenue stream in the energy sector and would also have similar investment structures to traditional energy and infrastructure investments. In addition, there is still a lack of legal frameworks and economic policy incentives to support private capital participation. There is a clear role for MDBs to pilot such issuances and disseminate information to build investor knowledge and confidence, thus creating the market.

That said, in recent years there have been notable examples of nature and biodiversity focused green bonds in both public and private sector. Capital Monitor [identified 28 bonds](#) totalling USD14.5 billion with funds dedicated to biodiversity and nature from 2019-2022.

### Case Study 3. World Bank Rhino Bond

In March 2022 the World Bank issued the first of a kind nature conservation bond linking investor returns with the survival rates of the Rhino and also supporting conservation activities at two nature reserves in South Africa. With AAA-rated World Bank as issuer and GEF as donor, the bond was structured in a way that can attract capital from institutional investors.

Source: [Investors Join Landmark Wildlife Conservation Bond to Support Black Rhinos and Local Communities in South Africa \(worldbank.org\)](https://www.worldbank.org/en/news/press-release/2022/03/22-investors-join-landmark-wildlife-conservation-bond-to-support-black-rhinos-and-local-communities-in-south-africa)

### Case Study 4. China: First Biodiversity-Themed Green Bond

In September 2021, the Bank of China raised the equivalent of USD580 million from a two-year biodiversity-themed green bond, devoted to terrestrial and aquatic biodiversity conservation and sustainable land-use projects across China. This was the world's first biodiversity-themed green bond, details of which are presented in the table below.

Region	Project	Eligible project category	Loan (RMB million)
Central China	Ecological construction demonstration project	Terrestrial and aquatic biodiversity conservation	400.00
Northern China	Ecological restoration project in mountainous area	Terrestrial and aquatic biodiversity conservation	740.00
Central China	Ecological water network project	Terrestrial and aquatic biodiversity conservation	194.45
Southwest China	National forest reserve project in Southwest China	Environmentally sustainable management of living natural resources and land use	350.00
Central China	National forest reserve project in Central China	Environmentally sustainable management of living natural resources and land use	156.00
Eastern China	Low-quality and low-efficiency forest renovation project	Environmentally sustainable management of living natural resources and land use	150.00
<b>Total</b>			<b>1,990.45</b>

Source: [Bank of China, Bank of China plans to issue its September 2021 Green Bonds in Offshore Markets](https://www.bankofchina.com/en/press-release/2021/09/21-green-bonds-in-offshore-markets)

### Related NAI financing opportunity: [Natural infrastructure bond](#)

MDBs may consider issuing green bonds with a natural infrastructure theme. Supported by a portfolio of loans as covered in the opportunity described above, this has potential to stimulate demand for similar projects by educating investors and developing confidence. This in turn will help to channel more funds towards nature as infrastructure and conservation projects that will help achieve the goals of the GBF.

### 3. Debt-for-nature Swaps

The average size of the 15 largest debt-for-nature swaps up until 2021 was around USD120 million. However, since then swaps of between USD500 million and USD1.6 billion have occurred. Debt for nature swaps have become an increasingly common transaction type with a potential market value estimated at [USD800 billion](#), simultaneously enabled by country-specific fiscal conditions and negative macroeconomic outlook exacerbated by the COVID-19 crisis and commitments to reach nature and biodiversity conservation and restoration goals.

The first debt-for-nature swap is considered to have been executed for [Bolivia](#) in 1987, facilitated by Conservation International. A typical swap is a tripartite transaction, which involves buy-back of existing debt (Eurobonds or domestic bonds) of the debtor country with a parallel issuance of new debt. This fresh debt is backed by guarantees from multilateral institutions or government agencies and is conditional on policy actions or investment commitments. This leads to an overall reduction in debt stock, and portion of the resulting debt relief is used to fund the investment commitments.

The benefits of these instruments can be described as follows:

- **Debtor Country:** Debtor countries will have the ability to reduce their total outstanding external debt due to re-purchase of debt in more favorable terms, and pay for sectoral programs, rather than through debt servicing.
- **Creditor:** Once creditors sell the debt claims, they can reinvest the proceeds from the sale in other higher return assets in a relatively different market with elevated interest rates.
- **Thematic programme manager:** International organizations, acting either as program managers or donors can have access to a portion of the savings that may be channeled to thematic programs identified in the debtor country. The access to the funds generated from the swaps may be in tranches over an extended period and may serve as a source of funding for systematic program planning. While the debt swap may be typically labeled as addressing one thematic area, they will often result in co-benefits for other thematic areas—a debt-for-nature swap may also provide climate adaptation and climate mitigation benefits, enhancing the overall impact.

Concerns regarding debt-for-nature swaps include (1) high degree of complexity with high transaction costs, (2) may result in a relatively small amount of debt reduction, and (3) only a limited portion of the overall debt swap amount is targeted for biodiversity conservation.

### Case Study 5. Ecuador: Debt-for-Nature Swap to Protect the Galapagos Islands

In May 2023, Ecuador announced the biggest ever debt-for-nature swap. Ecuador converted USD1.6 billion of its existing debt, with the help of the Pew Bertarelli Ocean Legacy Project and other partners, into a USD656 million loan financed through a bond issued by global investment bank Credit Suisse. The new loan will be repaid over the next 18 years with the country providing around USD17 million a year for conservation.

In 2022, the Inter-American Development Bank provided a guarantee of USD100 million to the Government of Barbados for a debt-to-blue economy swap, in conjunction with The Nature Conservancy.

Source: R. Frost. 2023. [Ecuador strikes world's biggest 'debt for nature' deal to protect the Galápagos Islands](#). EuroNews. Oct. 5.

#### Related NAI financing opportunity: [Debt-for-nature swaps – natural infrastructure focus](#)

Debt for nature swaps could be specifically designed so that repayments are targeted to conserving, maintaining, and restoring critical natural infrastructure. Co-benefits may include watershed management, storm protection and carbon sequestration along with other sustainable development outcomes.

#### 4. Sustainability-linked Loans / Performance-linked Loans

The 2023 [More For Less](#) report by the Sustainability-linked Sovereign Debt Hub describes sustainability-linked sovereign debt instruments as mechanisms to lower borrowing costs by unlocking new sources of capital for Emerging Markets and Developing Economies (EMDEs), especially when paired with credit enhancement that lowers the credit risk of such instruments. They enhance the accountability and credibility of climate and nature pledges of governments by establishing clear performance metrics and financial incentives to achieve them. The report estimates that the market size for EMDEs alone could be USD250 billion to USD400 billion by 2030, though not all of that would be tagged for biodiversity and nature.

Environmental impact bonds are performance-linked loans structured using a pay-for-success mechanism that ties payment for service delivery to the achievement of measurable outcomes. Performance payouts (repayment of the original investment with interest) are contingent on the achievement of preestablished environmental outcomes. Pay-for-success contracts secure capital from private investors for initial project costs. In return, investors require a commitment from project beneficiaries to pay for project outcomes according to the benefit they receive. Upfront investors are repaid based on the magnitude of the outcomes achieved, thus incentivizing investors to support interventions that will generate desirable results. While the 2019 market size [according to Paulson Institute](#) was small at USD150 million, they predict the 2030 market size to be USD5 billion to USD25 billion.

### Case Study No. 6. Indonesia: Sustainability-Linked Loan for Agroforestry in Java

The Asian Development Bank (ADB) signed a USD15 million loan facility with PT Dharma Satya Nusantara Tbk (DSNG) to help the company expand sustainable wood processing, rural livelihood development, and climate-resilient agroforestry in Java, Indonesia. Proceeds from the ADB loan will finance capital expenditure to implement energy-efficient and water-saving processes, and procurement of cultivated native Indonesian Sengon and Jabon trees. Farmed native trees can be a sustainable alternative to natural timber, preventing deforestation and supporting biodiversity. It is DSNG's first sustainability-linked financing, with adjustments in pricing upon achieving pre-defined annual sustainability targets, including training farmers to obtain forest management certification from the Forest Stewardship Council.

Source: ADB. 2023. [ADB, DSNG Sign Sustainability-Linked Loan to Support Rural Livelihoods and Agroforestry in Indonesia](#). Press release.

#### Related NAI financing opportunity – Performance-linked natural infrastructure loan

Performance linked loans should have clear, predetermined key performance indicators (KPIs) for projects with natural infrastructure components which could include nature-based solutions for green buildings and cities, conservation or restoration of natural infrastructure including mangrove forests, coral reefs or wetlands, or nature-based solutions for watershed management.

Adjusted pricing could be offered if pre-determined KPIs are met. For example:

- Reduced energy consumption for cooling buildings resulting from x% use of green roofs.
- Avoided storm damage and associated cost thanks to mangrove or coral reef restoration/conservation
- Reduced water treatment infrastructure costs due to improved water quality resulting from wetland restoration/protection

Third-party verification of the actual vs expected savings/avoided costs would be an important consideration, along with relevant KPIs being clearly articulated and agreed. These should demonstrate additionality, rather than what could be considered baseline sustainability efforts.

### 5. Nature-based solutions carbon credits and offsets

With the increasing demand for carbon credits due to a growing number of corporate climate commitments, McKinsey estimates that the carbon credit demand could grow 15-fold by 2030 to a market value of USD [50 billion](#). In line with growing understanding in valuing nature and the importance of the climate-nature nexus, NBS carbon credits are in high demand thanks to the attractive co-benefits including for biodiversity rather than a sole focus on carbon sequestration.

Thirty-seven percent of climate mitigation has the potential to come from NBS. **Asia is a major source of NBS credits (generating 35% to 40% of global NBS credits issued in 2021) and holds a third of the world's NBS potential.** However, it has a shortage of project developers meaning that there is space to spearhead project design or cooperate with local project developers and target countries with rich natural resources.

### Case Study No. 7. LEAF Coalition

An excellent example of nature-based solution carbon credits and related financing in practice is the LEAF Coalition—a partnership between more than 20 leading corporations and the governments of Norway, the United Kingdom and the United States—which aims to halt deforestation by providing financial support to forest countries for large-scale forest protection. Since its launch in 2021, the coalition has mobilized more than USD1 billion in financing.

In order to join the coalition, companies must demonstrate best practice in climate target setting and action, and any credits bought through LEAF must be additional to abatement measures, in line with the Paris Agreement. Tropical and sub-tropical countries and sub-national jurisdictions can submit emissions reductions proposals to LEAF over a five-year period.

LEAF uses the independent ART/TREES standard to ensure environmental and social integrity. Recognizing the critical role of indigenous peoples and local communities (IPLCs) in stewarding and safeguarding the world's forests, ART/TREES requires IPLCs to be full and effective partners in the design, implementation and periodic assessment of REDD+ actions, including, if applicable, through free, prior and informed consent.

Source: [The LEAF Coalition](#)

### Case Study No. 8. China: Carbon Wetland Sink Loan

China's Industrial Bank granted the first littoral wetland carbon sink loan in China in 2021, with the wetland's long-term income rights from carbon trading as collateral. The wetland carbon sink at Jiaozhou Bay was pledged as collateral for the RMB18 million loan, which would be used to buy wetland plants with greater carbon absorption capacity to protect marine wetland and biodiversity, and help enterprises translate ecological value into economic value. The loan was granted to a company managing the coastal wetland. The issuance of the loan considered an overall analysis on the wetland's carbon sequestration capacity as a fundamental factor, and the loan amount was calculated based on the transaction prices in the national carbon market, with the wetland's long-term income rights from carbon trading as collateral.

Source: [Industrial Bank issues China's first carbon sink loan worth 18 mln yuan - Xinhua \(news.cn\)](#)

### **Case Study No. 9. Carbon Opportunities Fund: Raising Private Capital to Sell Carbon Credits**

In 2022, the International Finance Corporation, Cultivo, Aspiration, and Chia Network launched the Carbon Opportunities Fund, a global investment platform that will raise private capital for an innovative model to source, tokenize and sell high-quality, verified carbon credits. The Fund will seek to catalyze investments in the voluntary carbon markets and broaden access to finance for nature-based projects certified by leading international standards bodies.

Source: [Carbon Opportunities Fund Launches First-of-its-Kind Investment Platform to Issue Tokenized Carbon Credits \(ifc.org\)](https://www.ifc.org/press-releases/2022/07/2022-07-14-carbon-opportunities-fund-launches-first-of-its-kind-investment-platform-to-issue-tokenized-carbon-credits)

**Related NAI financing opportunity: Nature based solutions carbon credit alliance – protection of critical forest infrastructure.**

Given the infrastructure services forests provide as carbon sinks, financing high integrity forest protection linked to the carbon markets could be considered.

One example is by taking part in multi-stakeholder partnerships aimed at halting deforestation by providing financing to countries with tropical and subtropical forests for large-scale forest protection. Emission reductions would be supplied by forest countries, and private sector companies would then purchase emissions reductions to satisfy the fast-growing demand for nature-based carbon credits.

Building on well-working global examples as a model, it is important to find the right stakeholders to establish partnerships with strong governance structure including:

- (1) national and sub-jurisdictional governments who supply the credits,
- (2) corporates who buy the credits, and
- (3) a third-party verifier to certify the credits.

## **6. Blended Finance**

There are also examples where several of the above approaches are used together or as part of a solution.

The Green Climate Fund's [Cloud Forest projects](#) represent a case which combines debt-for-nature swap, sustainability-linked bond, and a results-based financing system to protect cloud forests on which hydro-electric power plants depend for water flow, water quality and water regulation services. Payment for ecosystem service models have also proved very successful as illustrated by the example of New York City and can be leveraged as part of blended finance solutions.



### **Case Study No. 10. Latin America: Domestic Payments and Payments for Ecosystem Services**

Conservation International and the Climate Finance Lab further developed the idea of the Cloud Forest Blue Energy Mechanism based on a combination of domestic investments (loans or equity) and payments for ecosystem services. The aim is to engage hydropower operators in Latin America to pay for upstream forest conservation and restoration through a new pay-for-success model, in which a hydropower plant pays for measurable ecosystem benefits provided by cloud forests within the plant's catchment—principally reduced sedimentation, increased water flow and improved water regulation.

An overarching organization acts as a global project development company which sets up and provides seed funding for a Special Purpose Vehicle (SPV) in each project site where a cloud forest watershed overlaps with a hydropower catchment area. The SPV runs the project and manages operations in each location. This enables much-needed flexibility in organizational structure and delivers transactional benefits expected to outweigh associated transactional costs. Debt and/or equity financing is raised from domestic investors who provide the SPV with the funding required. The SPV, in turn, organizes stakeholders within the watershed and uses raised capital to pay the implementation partners for the initial restoration and ongoing conservation of cloud forest within the plant's catchment area. Restoration and protection of tropical cloud forest provides measurable ecosystem services of reduced sedimentation, increased water flow and improved water regulation. Benefits received by the company are measured by an independent evaluator and trigger payments from the hydropower company to the SPV through performance metrics established in the pay for success contract. Finally, the SPV uses revenues to pay back investors.

Source: [Making blended finance work for nature-based solutions | Green Climate Fund](#)

### **Case Study No. 11. New York City: Payment for Ecosystem Service Models**

New York City pays upstream farmers to control nutrient runoff can affect the quality and safety of drinking water. To avoid building a USD5 billion filtration plant to meet national drinking water quality regulations, New York City funds the adoption of best practices by farmers to avoid polluting relevant watersheds. The city provides financial incentives to farmers to take voluntary measures on private land that benefit the general public. Examples include:

- Following prescribed plans for the spreading of manure or fertilizer on fields to maximize plant uptake for crop production while minimizing nutrient runoff and erosion
- Precision feed management for dairy cows and beef cattle to minimize phosphorus and nitrogen excretion

- Forage management practices for protecting water quality (e.g. prescribed grazing plans, annual crop plans, use of cover crops to prevent soil erosion while maximizing crop yields)
- Payments to conserve natural ecosystems and riparian buffers (i.e. conservation easements)

Source: [The Post-2020 Global Biodiversity Framework and What it Means for Business | World Economic Forum \(weforum.org\)](https://www.weforum.org/publications/the-post-2020-global-biodiversity-framework-and-what-it-means-for-business/)

### **Case Study No. 12. Asia Climate Solutions (ACS) Design Grant**

Despite the significant potential of blended finance, often the transactions are complex, time-intensive, and costly to structure and launch. As a market acceleration programme, Convergence developed Design Funding to provide early-stage funding focused on the design of blended finance solutions. This support encourages the design of solutions that would otherwise be too risky or complex to pursue but show high potential to attract private capital at scale if successful.

On June 2, 2023, Convergence launched the Asia Climate Solutions (ACS) Design Grant under the auspices of the Singapore-Australia Green Economy Agreement. The ACS Design Grant will award grants for the design and launch of innovative blended finance solutions that mobilise private capital to sectors critical for climate transition and resilience in developing markets in Asia.

The ACS Design Grant will target critical climate mitigation and adaptation sectors in Asia including NBS, clean energy transition, and sustainable cities and infrastructure. It will provide feasibility study (USD50,000 to USD200,000) and proof of concept (USD 200,000 to 400,000) grants for innovative solutions using blended capital structures to crowd-in more climate-smart investment in the region.

Source: <https://www.convergence.finance/news-and-events/news/58qYhp6Ylug5e6XhYk0OOQ/view>

#### **Related NAI financing opportunity: Blended finance for nature**

Blended finance initiatives can mobilize capital towards natural infrastructure projects. The Cloud Forest case study shared above would be an interesting one to consider. A more complex project could combine debt-for-nature swap, funding for an SPV, sustainability-linked bond, and a results-based financing system to protect cloud forests on which hydro-electric power plants depend for water flow, water quality and water regulation services.

There could be multiple entry points in projects like this including supporting the debt-for-nature swap or providing first-loss equity or a loan to the SPV to help capitalize and de-risk it for subsequent investors.

## VII. Conclusion and Recommendations

The global financing gap induced by biodiversity loss and climate change is calling for public and private resource mobilisation. Momentum in development financing institutions and the private sector and investments in nature-based solutions are growing fast. While investments in nature as infrastructure projects do not yet form a significant part of portfolios, the use of nature-based solutions, including in infrastructure projects is widespread.

There is a clear opportunity for MDBs to demonstrate leadership through impact through financing nature as infrastructure projects using the financing opportunities listed in this report, while also considering using nature-based solutions in infrastructure projects.

### A. The Role of MDBs

MDBs have a responsibility to support member countries in implementing their commitments under the Kunming-Montreal Global Biodiversity Framework, as they do with the Paris Agreement on climate change. MDBs can support its members to mobilize at least USD200 billion financial resources per year from all sources by 2030, progressively closing the USD700 billion annual global biodiversity financing gap by mainstreaming nature and biodiversity considerations into the MDB operations and aligning financial flows with the GBF.

As a group of highly influential and capitalised development financing institutions, MDBs can also influence the market by creating joint taxonomies, and originating, structuring and investing in high-impact, scalable demonstration projects.

The Joint MDB Nature Heads Group has been tasked to implement the joint [MDB Nature People and Planet Statement](#), with a timeline to mainstream nature by 2025. The Group has also published the [Common Principles on Nature Positive Finance](#), and is conducting a stocktake of biodiversity KPIs as committed in the [MDB Presidents' Viewpoint Note](#).

### B. AIIB's Efforts to Date

AIIB participated at COP15 in Montreal in December 2022 for the first time, raising the profile of its work on biodiversity and connecting with partners in the nature and biodiversity space. AIIB has taken many steps in the right direction in a short period of time since then.

It has commissioned the *Business of Nature* internal report which presented the case for considering nature as infrastructure, and opportunities to create direct and indirect project value through:

- (1) Strengthening the extent to which conventional infrastructure considers and values nature, improving the shift towards natural infrastructure projects and,
- (2) Identifying opportunities where natural infrastructure can be deployed, in isolation or in support of "grey" infrastructure delivery.

Progress has been made on integrating Nature and Biodiversity as part of promoting a holistic approach in AIIB's project selection, design and financing as stated in the Bank's 2023 [Climate Action Plan](#). The discussions around nature as infrastructure have been elevated via the Bank's 2023 [Asian Infrastructure Finance Report: Nature as Infrastructure](#) prepared by the

Economics Department” which gained widespread support from AIIB Members, MDBs and academia.

A review of AIIB’s portfolio and pipeline projects has shown multiple projects already include NBS, and that some others have the potential to do so. This and peer MDBs’ experience shows that there are clear opportunities to use NBS in infrastructure sectors. AIIB is building on lessons learned from these pilot bottom-up case studies to deliberate a more systematic application of nature-based solutions across its portfolio.

In doing so, AIIB has developed a sample catalogue of NBS for infrastructure projects which project teams can use as they seek to understand the NBS opportunities within projects that they manage, and how these opportunities can be incorporated into projects to make for better investments that consider upfront, operating and maintenance costs, and climate and biodiversity co-benefits.

These efforts come in addition to the robust safeguards that AIIB applies on biodiversity risk as described in its [Environmental and Social Framework](#) applicable to all projects historically financed by the Bank, which ensures that projects do no harm to the environment and its biodiversity. It does so by applying the mitigation hierarchy of avoid, restore, minimize and offset in line with peer MDBs’ standards, and requires the demonstration of net gain for critical habitats and no net loss for natural and modified habitats as financing conditions.

### C. How AIIB Can Play a Role

As the newest MDB with 110 members and USD100 billion capital, AIIB has a timely and unique opportunity to develop a portfolio of nature as infrastructure projects, opening markets to stimulate further opportunities, mobilize private capital and create greater impact across the region. As an MDB with public and private sector operations under the same balance sheet, AIIB could provide early-stage, concessionary, or risk-mitigating financing that catalyzes the development of infrastructure projects that support conservation efforts.

Investing in Nature as Infrastructure can be an effective way of alleviating pressure from the twin crises of biodiversity loss and climate change, as well as meeting the green, connected and technology-enabled infrastructure development needs of the Bank’s member countries. This could be done through a wide range of innovative financing instruments – including sustainability-linked loans and bonds, guarantees, as well as blended finance – that are currently available in its toolkit, tailored towards clients’ needs and investors’ appetite for risk-adjusted-return.

In particular, a focus on raising awareness of what is possible when considering nature as infrastructure and understanding why it makes for better investment decisions could present an excellent opportunity for AIIB. One aspect of this would be the demonstration effect—incubating selective high-impact NAI projects—which could mobilize institutional investors and define NAI projects as an asset class in the long term, similar to what AIIB has done for [investing in grey infrastructure as asset-backed securities in recent years](#).



ASIAN INFRASTRUCTURE  
INVESTMENT BANK

## INVESTING IN NATURE AS INFRASTRUCTURE

THE OPPORTUNITY

October 2024



### **Investing in Nature as Infrastructure: The Opportunity**

presents opportunities for investing in nature as infrastructure (NAI) through using a range of financing instruments – including loans, bonds, guarantees, performance linked-instruments, carbon credits and offsets, and blended finance. It is intended as a high-level guide to set the direction and build momentum—particularly among multilateral development banks (MDBs)—of investments in NAI.

By demonstrating the financial feasibility, impact and scalability of investing in NAI through proof-of-concept projects, this paper argues that MDBs, including AIIB, have a catalytic role in mobilizing private capital towards green infrastructure with climate change mitigation, adaptation and biodiversity co-benefits, promoting greater regional and global attention and action for nature.