

PUBLIC INTERNATIONAL FUNDING OF NATURE-BASED SOLUTIONS FOR ADAPTATION: A LANDSCAPE ASSESSMENT

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EXECUTIVE SUMMARY

Highlights

- Overall, the amount of public international funding flowing to nature-based solutions (NbS) for adaptation is still relatively small, accounting for only US\$3.8–8.7 billion, or approximately 0.6–1.4 percent of total climate finance flows¹ and 1.5–3.4 percent of public climate finance flows, in 2018.
- Funding for NbS for adaptation (NbSA) in 2018 was driven by a handful of major bilateral donors, including Germany, the United Kingdom, Japan, and Sweden. The European Union, Asian Development Bank, the Green Climate Fund, and the International Fund for Agricultural Development were among the largest multilateral donors and channels of funding. Countries in Sub-Saharan Africa and South and Central Asia received approximately 50 percent of total public NbSA funding.
- Funding in 2018 came primarily through grants. Though grants may play an important role, utilizing a broader range of instruments for NbSA may increase the opportunities to crowd in and catalyze private capital with public concessional finance.
- The absence of clear definitions, guidelines, and metrics and methodologies to track, quantify, and value NbSA benefits may significantly inhibit the development and financing of a robust pipeline of NbSA-related investments.
- Some NbSA projects do not provide reliable revenue streams, making it important to find other ways to fund long-term operational costs. To scale up and mobilize additional sources of funding, the full economic and financial case for NbSA—including cobenefits—needs to be clearly communicated.

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The 2019 flagship report *Adapt Now: A Global Call for Leadership on Climate Resilience* by the Global Commission on Adaptation (the Commission) identified access to finance as one of three key barriers that impede the scaling up of NbSA in many countries. NbSA encompasses several different types of activities, investments, and approaches that seek to protect and restore nature and ecosystems for the services they provide to human society.² Although various funding sources may exist, an individual country's ability to access them depends on a range of factors, including readiness and capacity, knowledge, and foresight to plan NbSA investments and the skills to finance such investments. For many developing countries, these efforts may be further complicated due to overall economic challenges and those now resulting from the COVID-19 pandemic. Meanwhile, interest in NbSA investment is changing quickly, with new actors, approaches, and investors seeking opportunities to invest in newly emerging NbSA in recent years.

NbSA investments will be fundamentally important in helping many countries address climate change. In almost all circumstances, public capital will be highly valuable. Climate finance and official development assistance (ODA) will be important to help developing countries scale up such investments, particularly where national public budgets may be constrained. Furthermore, because of the range of development and other benefits that NbSA can bring, integrating such approaches into post-COVID economic recovery planning can maximize the effectiveness of international and domestic public funding while delivering long-term resilience.

Demand exists. Seddon et al. (2019) showed that more than 60 percent of countries recognize the need to preserve ecosystems and have included NbS into their first nationally determined contributions (NDCs). Likewise, a similarly high number of countries acknowledge that protecting ecosystems and enhancing biodiversity is a key goal of their adaptation planning efforts.

This paper provides the first assessment of the landscape of public international funding (climate finance and ODA) for NbSA and seeks to help donor and developing countries better understand the current state of funding flowing for NbSA. The findings in this paper are based on an assessment of funding flows as well as interviews with key stakeholders, such as donors, climate finance funds, multilateral development banks, and countries.

The landscape assessment has some very important constraints. It covers only public international funding (not domestic budgets), and estimates are based on imperfect tagging within the data sets analyzed. Because the data sets analyzed do not explicitly tag NbS or NbSA, the authors tracked funding from sectors that most commonly align with NbSA, such as forestry or water. The assessment, therefore, is unlikely to capture all funding for NbSA. (More detail on the methodology can be found in Appendix A.)

The figures cited as the most definitive measure of total climate finance flows come from the Climate Policy Initiative (CPI) and include public, private, and some south-south flows. CPI's figures provide context for the NbSA estimates in this paper because their tracking is the most common citation for international and policy discussions around climate finance.³ This landscape assessment covers only public international funding. It shows that in 2018 public international finance for NbSA was estimated to account for \$3.8–\$8.7 billion—or 0.6–1.4 percent of total climate finance flows, 1.5–3.4 percent of total public climate finance flows, and 9–21 percent of adaptation flows⁴—and relative to more than \$140 billion per year in adaptation investment needs in developing countries (UNEP 2021).⁵ Furthermore, CPI estimates that total funding for both adaptation and mitigation in the “agriculture, forestry, land-use, and natural resource management” sectors in 2018 only accounted for 3 percent of all tracked climate finance or 7 percent of tracked public finance (Buchner et al. 2019). Although not entirely comparable due to the mitigation activities in these sectors, this figure is often referenced as a data point to indicate overall NbS flows.

In 2018, the largest bilateral donors for NbSA included Germany, the United Kingdom, Japan, and Sweden. The European Union, Asian Development Bank, Green Climate Fund, and the International Fund for Agricultural Development were among the largest multilateral donors and channels of funding. Grants were, by far, the most common funding modality, accounting for as much as 85 percent of funds deployed to developing countries. Sub-Saharan Africa, South Asia, and Latin America and the Caribbean received the greatest volume of funding for NbSA. Although each country's use of international support is different, agriculture, general environmental protection,⁶ and biodiversity are the most common sectors in which ODA funding directed toward NbSA was spent.

This paper also identifies barriers in the ODA funding landscape that, if addressed, can help donors maximize the impact of their public capital to accelerate these much-needed investments. These barriers also, directly and indirectly, contribute to the lack of pipeline and inhibit the development of NbSA projects. Key barriers include the following:

- **No common definition of NbSA exists.** Countries, as well as other key stakeholders, still lack clarity around what constitutes adaptation-focused NbS. This confusion is most evident in international tracking systems (e.g., the Organisation for Economic Co-operation and Development’s statistics database) and within countries, and it likely inhibits the potential pipeline of NbSA investments.
- **No clear metrics exist to value NbSA.** Interviewees for this paper noted the need for metrics and methodologies to measure NbSA benefits and stated that the lack of such makes it difficult for developing countries, project developers, development institutions, and investors to appraise and compare NbSA options against other investment options; thus, they often are not prioritized.
- **Donor sources of funding do not align with needs.** Donor funding sources, where available, are insufficient in volume to meet all NbSA needs (measured by the potential demand evidenced through a country’s NDC and national adaptation plan). Donor sources have primarily been in the form of grant capital. Many interviewees noted that NbSA projects need ongoing funding to support longer-term operational costs. This results in a significant funding gap that neither private investors nor developing countries can bear.
- **Channels of donor funding do not explicitly promote NbSA.** Climate finance channels do not provide clear, specific guidance on how their funding can be used to support NbSA investments.
- **Challenges in developing the NbSA pipeline hinder access to financing.** At both the national and subnational level, developing countries may lack the technical capacity to integrate NbSA into their adaptation planning and sufficiently develop NbSA projects and/or the NbSA project pipeline.

This paper puts forward four recommended actions to address these barriers hindering public donor funding support for NbSA. These recommended actions for public

donors complement recommendations from reports that focus on mobilizing private capital for NbSA (see Box 4 in Section 5).

- **Scale and better track ODA funding for NbSA.** Donors should scale up the ODA allocated for NbSA, help to ensure accounting mechanisms better track flows, and provide the technical support to help developing countries develop and finance NbSA investments.
- **Better align ODA funding that is flowing.** Current ODA funding needs to be more closely aligned with individual NbSA project needs. Public funding is valuable to build capacity, prepare projects, and crowd in private capital. Donors should consider a more strategic application of public funding through flexible mechanisms, including concessional instruments to crowd in capital and grant support (where needed) over the life of the project where operational costs are unable to be borne by local governments or others.
- **Define, quantify, value, and measure NbSA benefits.** Donors should develop, adopt, and accelerate a common approach to quantify and value NbSA benefits in ways that are meaningful for investment decision-making by a variety of public and private investors.
- **Mainstream and build the pipeline of NbSA investment in developing countries.** Donor funding should support efforts by developing countries to both mainstream NbSA into national adaptation and development-related policies, budgets, and investment plans and build a pipeline of NbSA investments at the country level, through capacity building, project preparation, and technical assistance for developing countries.

1. INTRODUCTION

1.1 Background

Nature-based solutions (NbS) are defined as “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits” (World Conservation Congress 2016).

In recent years, awareness has increased about the importance of investing in NbS to both mitigate and adapt to climate change (Griscom et al. 2017). Attention

has focused on identifying promising approaches and developing initiatives that can scale finance for NbS for adaptation (NbSA), often through innovative mechanisms that blend public capital to catalyze and leverage private capital (see Box 1 for definitions used in this paper). NbSA projects are inherently complex, often delivering public goods that may imply longer-term returns on investment and entail bringing together a broad range of stakeholders to address systemic community and societal challenges (Seddon et al. 2020a). Nonetheless, the benefits of NbSA are significant (Figure 1) for their flexibility in terms of context, utility, and cost efficiency (UNEP 2021).

Furthermore, while awareness has grown, so has interest in funding and implementing these approaches. For example, 62 percent of all first NDCs (104 out of 168) include NbS as adaptation actions,⁷ and 63 percent of nationally determined contributions (NDCs) declare that the protection of ecosystems and/or biodiversity is the intended outcome of adaptation planning (Seddon et al. 2019). Additionally, 19 national adaptation plans (NAPs) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) by March 2020 included NbSA and/or ecosystem-based adaptation (EbA; Terton and Greenwalt 2020).

There is a significant overall funding gap for adaptation, of which NbSA are a part. In its *Adaptation Gap Report 2020*, the United Nations Environment Programme (UNEP) identified adaptation investment needs of more than US\$140 billion per year by 2030 (UNEP 2021). The Climate Policy Initiative (CPI) estimates that only \$30 billion in (mostly public) funding flowed for adaptation in 2018 (Buchner et al. 2019).

Box 1 | Definitions: NbS, NbSA, EbA, and Eco-DRR

Nature-based solutions (NbS) can be used for a variety of objectives, including climate change mitigation and/or adaptation, biodiversity conservation, and disaster risk reduction. This paper will focus on NbS that is used primarily for adaptation (NbSA). Note that NbS can often cut across sectors and provide multiple cobenefits; thus, although the focus of the paper is on NbSA, many of these NbS will provide benefits for biodiversity and mitigation as well.

NbSA, also known as ecosystem-based adaptation (EbA), is defined thusly by various organizations:

IUCN^a and CBD^b: "EbA is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change."

UNEP^c: "[EbA] uses biodiversity and ecosystem services as part of an overall adaptation strategy to help people and communities adapt to the negative effects of climate change at local, national, regional, and global levels."

European Commission: "EbA refers to physical measures or management actions that utilize natural or ecosystem-like processes to adapt to a variety of climate hazards."

NbSA can be categorized under different use cases, including agriculture, forestry, coastal, urban, water management, and disaster risk reduction. NbS for disaster risk reduction are sometimes known as ecosystem-based disaster risk reduction (Eco-DRR).

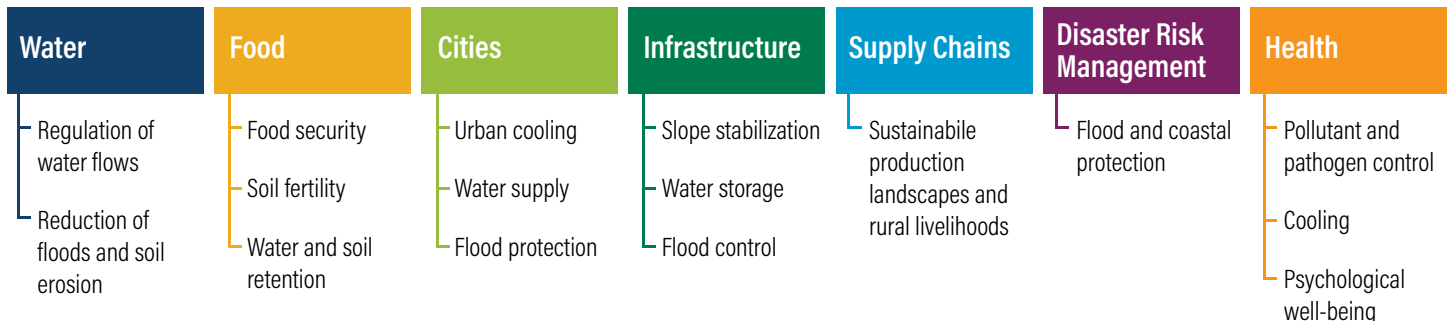
These definitions of NbSA inform the methodology in Box 3.

Notes: a. International Union for Conservation of Nature; b. Convention on Biological Diversity; c. United Nations Environment Programme.

Sources: McVittie et al. 2017; SCBD 2009; Travers et al. 2012.

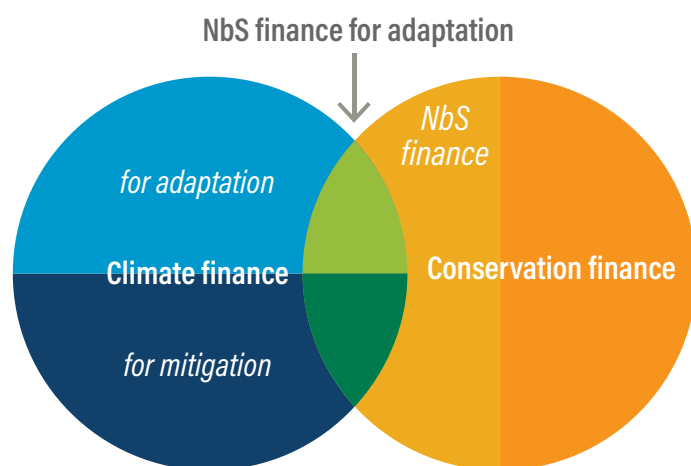
Figure 1 | Relationships between the Natural Environment and Climate Change Adaptation by Sector

THE NATURAL ENVIRONMENT SUPPORTS RESILIENCE ACROSS SECTORS



Source: Global Commission on Adaptation 2019.

Figure 2 | **The Relationship between NbS Finance for Adaptation, Climate Finance, and Conservation Finance**



Notes: NbS = nature-based solutions.

Source: UNEP 2021.

To date, there is no estimate of the total NbSA investment needed, although some estimates exist for related subsectors of NbSA (Figure 2 shows the relationship between these subsectors). For example, *Financing Nature: Closing the Global Biodiversity Financing Gap* estimated a current biodiversity conservation financing gap of between \$598 billion and \$824 billion per year (Deutz et al. 2020). Nevertheless, the report by the Global Commission on Adaptation (the Commission) highlighted access to finance as one of three key barriers that impede the scaling up of investment in NbS (Global Commission on Adaptation 2019).

In addition to the challenges of quantifying the NbSA funding gap, little analysis has been done of the amounts, types, and channels of public international funding to support NbS in developing countries. Given the importance of public capital in funding NbSA, a better understanding of these sources of funding is needed.

1.2 About This Working Paper

This paper provides an assessment of the landscape of public international funding for NbSA and seeks to help donor and developing countries better understand the current state of funding for NbSA. The findings in this paper are based on the sources in Box 2. This paper's primary audience is public donors providing funding

for NbSA; a secondary audience is developing countries looking to fund NbSA as part of their climate action plans, as a number of the findings and recommendations relate to enabling better, more efficient use of public expenditure for NbSA regardless of its origin.

This paper assesses the current landscape of public funding sources for official development assistance (ODA) available to developing countries for NbSA by

- estimating public international flows for NbSA;
- describing key funders and modalities of current funding sources;
- identifying challenges and barriers that may prevent increased funding for NbSA unless addressed; and
- illustrating through examples several promising approaches for programming public funding, including those that catalyze private investment in NbSA.

The paper concludes with actionable recommendations to improve the provision and application of public international donor funding for NbSA.

This assessment is meant to complement other ongoing research related to financing NbSA, including recent studies related to innovative financial instruments (e.g., insurance, results-based payments) and those assessing the potential to mobilize private investment for NbSA. It is also meant to complement other efforts to quantify climate finance flows writ large (e.g., CPI's climate finance landscape).⁸

Box 2 | Sources Used for This Report

The findings in this report are based on three main sources:

- The Organisation for Economic Co-operation and Development's Creditor Reporting System Aid Activity Database and other online research.
- A literature review, including information related to NbSA from donors, funding channels, developing country governments, and project developers.
- Surveys and interviews with key stakeholders (bilateral donors, development finance institutions, climate funds, developing country officials, etc.).

2. THE CURRENT FUNDING LANDSCAPE

This assessment uses the Creditor Reporting System (CRS) database of the Organisation for Economic Co-operation and Development (OECD) to estimate a range (lower and upper bound) of public international funding for NbSA using 2012, 2015, and 2018 data sets of project commitments. The methodology for this assessment is described below and is further detailed in Appendix A, which describes which OECD data codes were used, how the methodology filtered out commitments for NbS that may not be for adaptation activities, and other issues.

Estimates are based on the OECD's CRS database. All CRS projects are classified by sector, and some are tagged with the Rio markers (which indicate either the primary or significant intent of the funding, such as mitigation, adaptation, or biodiversity). Although sector classifications are exclusive—a funding flow cannot be tagged with more than one sector—markers are not exclusive, meaning funding flows can be tagged with more than one marker.

As a result, our lower-bound estimates represent a narrower assessment of funding flows for NbSA but do not include funding from and through the multilateral channels, such as multilateral development banks (MDBs) or climate funds, due to how multilateral data is reported to the OECD. Our upper-bound estimates represent a

broader assessment that loosens restrictions on both sectors and Rio marker tags; as a result, they may include some funding that does not primarily support NbSA objectives.

Please see Appendix A for a full description of the methodology used in this paper. In addition, Box 3 describes the limitations of the methodology.

2.1 The Public international Funding Landscape

It is estimated that in 2018, public donor finance for NbSA accounted for, conservatively, approximately 0.6 percent of total climate finance flows, 1.5 percent of public climate finance flows, and 9.0 percent of overall adaptation flows (Figure 3).⁹

Figure 4 provides an overview of the landscape of NbSA funding in 2018, highlighting the largest funders and channels for NbSA.

As shown below in Table 1 and Figure 5, tracked public funding for NbSA has increased over the years analyzed, from \$2.1–\$4.1 billion in 2012 to \$3.8–\$8.7 billion in 2018. For the years analyzed, the top ODA funders of NbSA were also among the top adaptation funders overall. Germany and the United Kingdom contributed

Box 3 | The Limitations of the Methodology

This paper does not capture flows beyond official development assistance (ODA) and nonconcessional development finance, such as domestic public financing and private financing; thus, the estimates provided herein are certainly an underestimate of the total flows for nature-based solutions for adaptation (NbSA).

Due to challenges in the available data sources, the information is only representative of the specific Organisation for Economic Co-operation and Development (OECD) data set used for this analysis. The methodology estimates

- general funding trends;
- top donor and recipient regions; and
- countries and uses (sectors).

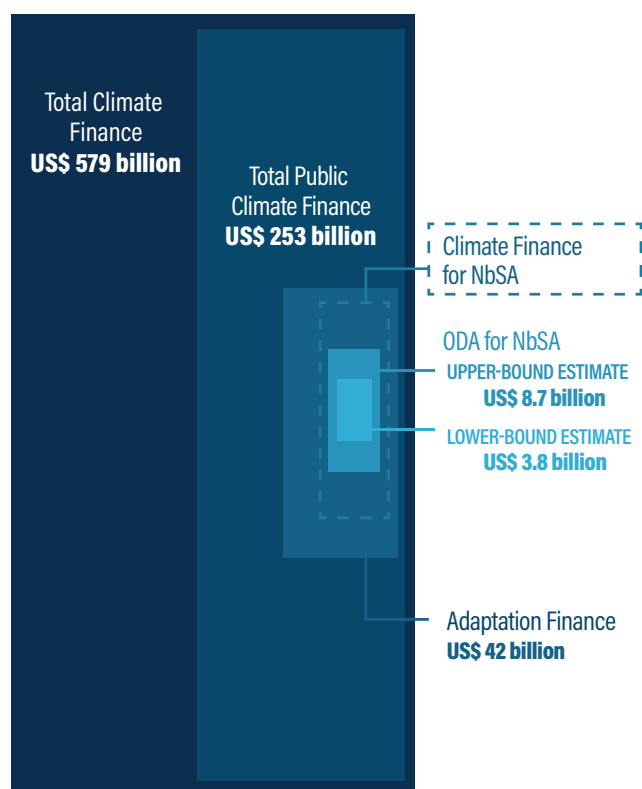
There are likely investments in specific sectors (e.g., forests) that may include adaptation cobenefits and elements but may not have been reported or

captured as NbSA. These issues may be further compounded because NbSA—and adaptation more broadly—often cuts across sectors; thus, the reporting and categorization of funding for NbSA is challenging. Also, there is likely a portion of NbS-related funding that, although principally focused on biodiversity conservation and/or climate mitigation, may have unreported adaptation elements or insufficiently assessed adaptation benefits that are thus not captured in this analysis.

The information presented shows only data reported within the OECD and therefore may miss funding provided through or by some donors or funding institutions (such as the World Bank) that are not included in the system. For this reason, it likely underestimates public NbSA flows.

In sum, the constraints on the methodology reflect the limitations of the data sets available as well as definitional and reporting challenges that affect both NbS and adaptation finance writ large.

Figure 3 | **Estimated ODA for NbSA in the Context of Total Climate Finance Flows in 2018**



Note: The \$42bn adaptation finance estimate refers to both adaptation-specific flows and those that have dual adaptation and mitigation benefits.

Source: Buchner et al. 2019.

significantly to the increase in ODA for NbSA funding between 2012 and 2018 (see Figure 6). Notably, a significant proportion (over 50 percent) of Germany's ODA in the analyzed sectors was for NbSA initiatives.

The lower bound estimates for multilateral organizations are assumed to be zero because these organizations did not use the biodiversity Rio marker. As noted in Box 3, the information presented includes only data reported within the OECD. As such, it may miss funding provided through or by some donors (bilateral or multilateral sources), and it may underreport some sources, such as the Global Environment Facility (GEF), for the years assessed.¹⁰

Table 1 | **ODA Funding for NbSA (US\$, millions)**

	DONOR	2012	2015	2018
BILATERAL	Germany	420–550	730–1,050	920–1,510
	United Kingdom	0–70	210–400	850–890
	Sweden	90–160	100–130	260–360
	Japan	330–590	20–470	230–450
	United States	290–430	180–350	110–220
MULTILATERAL	Asian Development Bank	-	-	0–1,580
	European Union institutions	380–750	340–1,000	790–1,560
	Green Climate Fund	-	0–40	0–460
	International Fund for Agricultural Development	-	0–460	0–250
	Global Environment Facility	-	0–110	0–180
	Adaptation Fund	0–40	0–50	0–55
	Total of all ODA funding for NbSA		2,130–4,170	2,690–6,230

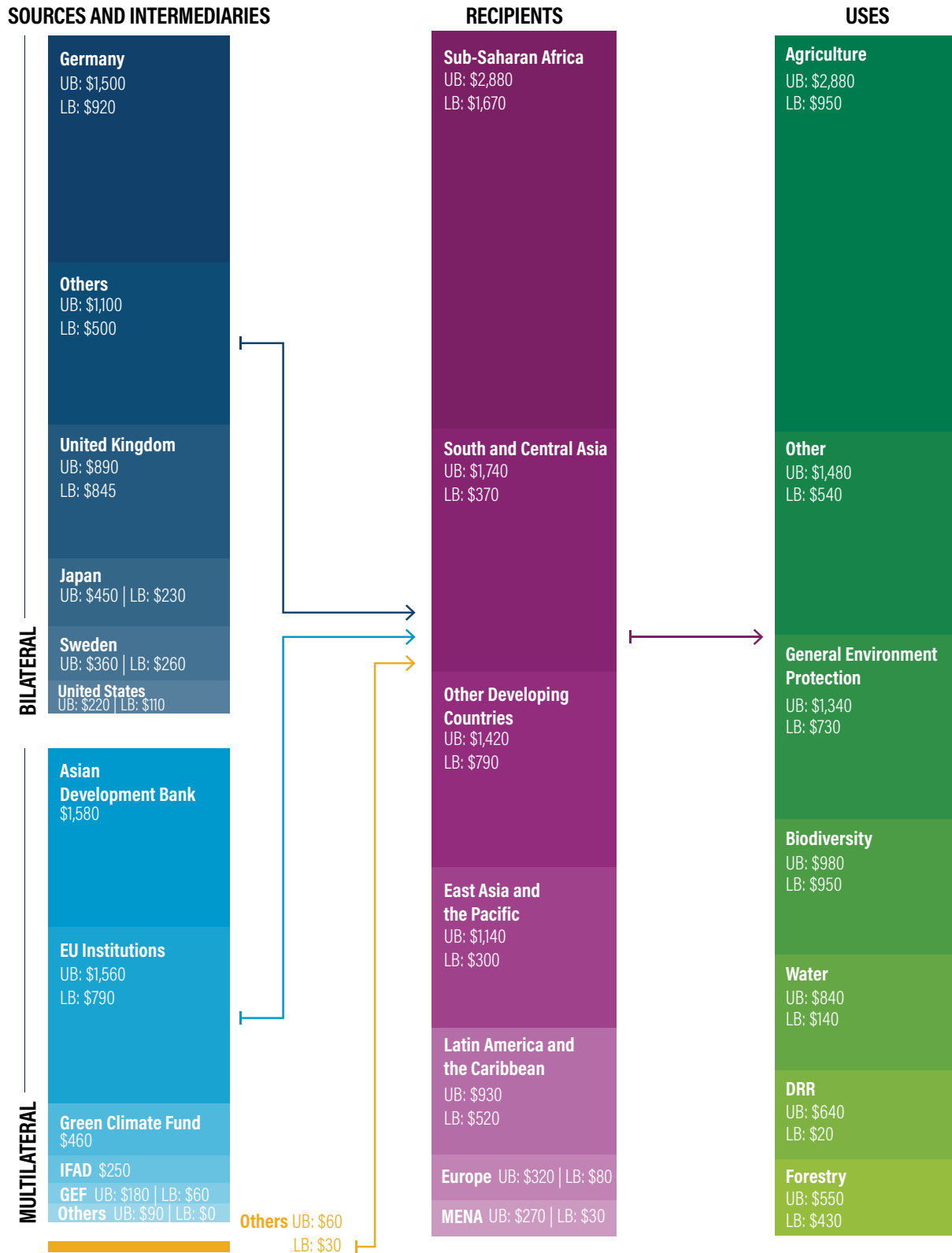
Note: NbSA = nature-based solutions for adaptation; ODA = official development assistance.

Source: Based on raw data from OECD.Stat database, Creditor Reporting System, modified by the authors.

In fact, the MDBs, including the World Bank, Inter-American Development Bank (IDB), European Bank for Reconstruction and Development, and others, typically support NbSA. However, these institutions may be reporting NbSA projects under different categories, or they may not be reporting as comprehensively to show a full picture of the landscape of funding flowing from these organizations. Also, given the recent rise in interest in NbSA, a landscape assessment for 2020 might include a wider range of bilateral and multilateral funders.

For more details on how the upper and lower bounds were constructed, please see Appendix A.

Figure 4 | The Landscape of ODA for NbSA Funding, 2018 (US\$, millions)



Note: UB = Upper Bound, LB = Lower Bound

Source: Based on raw data from OECD.Stat database, Creditor Reporting System, modified by the authors.

2.2 Key Funding Modalities for NbSA

For the three years analyzed, up to 85 percent of all tracked funding was categorized as ODA grants, and those that are categorized by the OECD as ODA loans are deemed “concessional,” implying a significant grant-equivalent component (see Table 2).

2.3 Recipients and Uses of Funding

2.3.1 Recipients

The top regions for tracked ODA funding for NbSA in 2018 were Sub-Saharan Africa, Latin America and the Caribbean, and South and Central Asia (see Table 3 and Figure 7). A large proportion of ODA funding does not specify the recipient country or region, indicating that significant amounts of funding flow through bilateral or multilateral multicountry programs (classified as going to “unspecified developing countries” by the OECD).

2.3.2 Uses of Funding

Biodiversity, general environmental protection, and agriculture are the top three NbSA-related sectors by estimated volume of funding tracked in 2018 (see Figure 8).¹¹

For all of the graphs below, the solid line represents the upper bound, and the dashed line represents the corresponding lower bound.

2.4 International Funding Channels

The primary funding channels listed for NbSA (as for adaptation in general) include generalist and specialist multilateral climate funds and MDBs as well as NbS-specific facilities. It should be noted that the figures for a fund’s “estimated amounts available” are for the entire fund and are thus indicative only; for some funds in Table 4, these estimated amounts are unlikely to be solely for NbSA. (Please see Table 4 for a listing with their modalities.)

Table 2 | Funding Modalities

MODALITY	2012 (%)	2015 (%)	2018 (%)
ODA grants	79–80	64–65	67–85
ODA loans	20–21	29–34	11–14
Other ^a	NA	0–7	1–22

Notes: ODA = official development assistance.

a. Includes other official flows (nonexport credit), equity investments, and private development finance (refers to philanthropies and nongovernmental organizations). Other official flows are defined as official sector transactions that do not meet ODA criteria, such as criteria for concessionality.

Source: Based on raw data from OECD.Stat database, Creditor Reporting System, modified by the authors.

Table 3 | Funding Received by Region and Country (US\$, millions)

REGIONS	2012	2015	2018
Sub-Saharan Africa	370–900	1,110–2,020	1,670–2,880
Latin America and the Caribbean	490–630	650–1,000	510–930
South and Central Asia	260–590	230–920	370–1,740
East Asia and the Pacific	480–900	230–750	300–1,140
Europe	25–150	45–390	80–320
Middle East and North Africa	120–210	170–280	30–270
Unspecified developing countries	380–790	240–870	790–1,420

Source: Based on raw data from OECD.Stat database, Creditor Reporting System, modified by the authors.

See Appendix A for a breakdown of the regions by country.

Figure 5 | Total ODA Funding Flows to NbSA

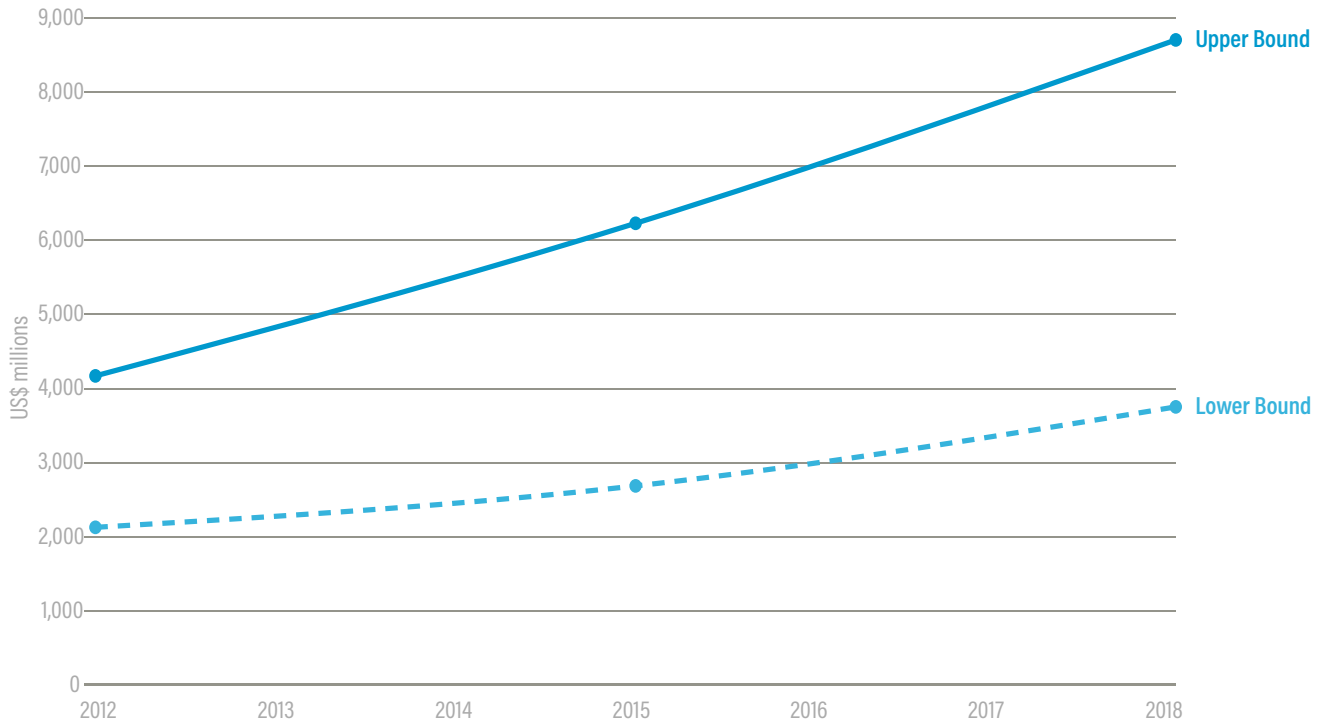


Figure 6 | ODA NbSA Funding Flows from Top Donors

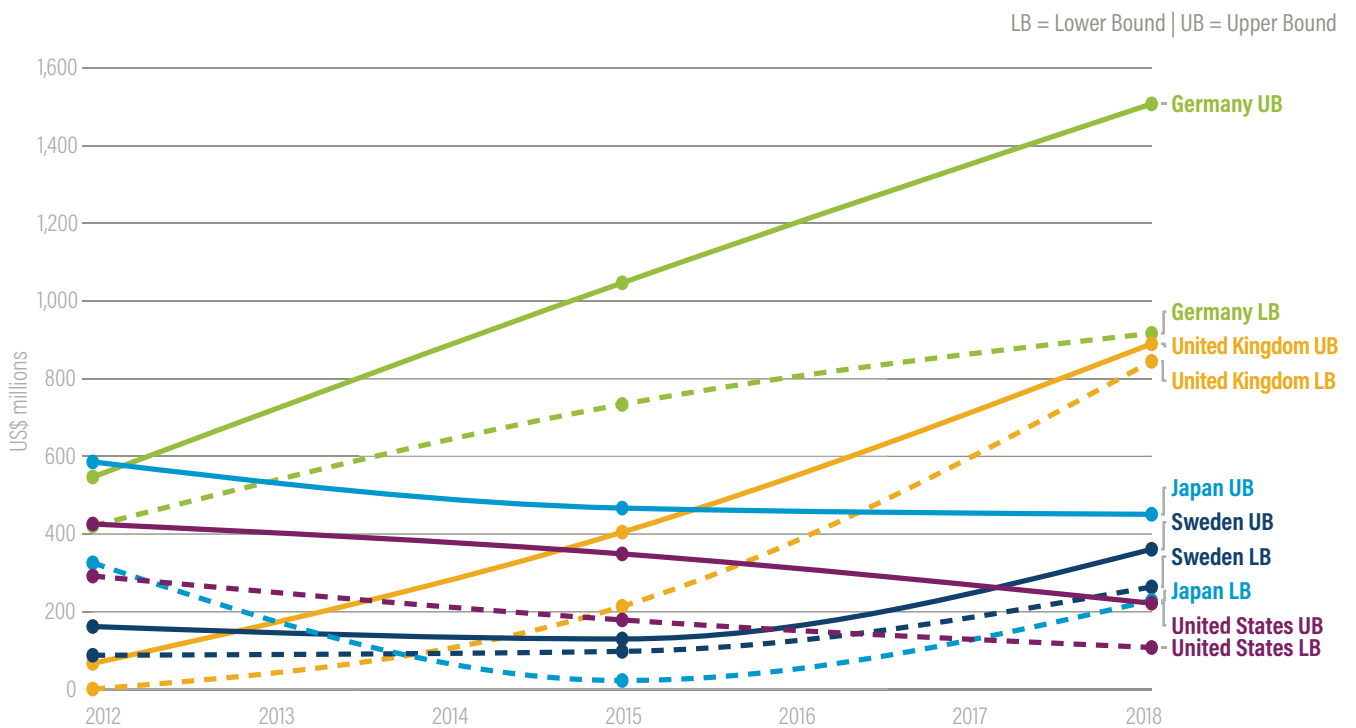


Figure 7 | ODA NbSA Funding Flows to Top Regions

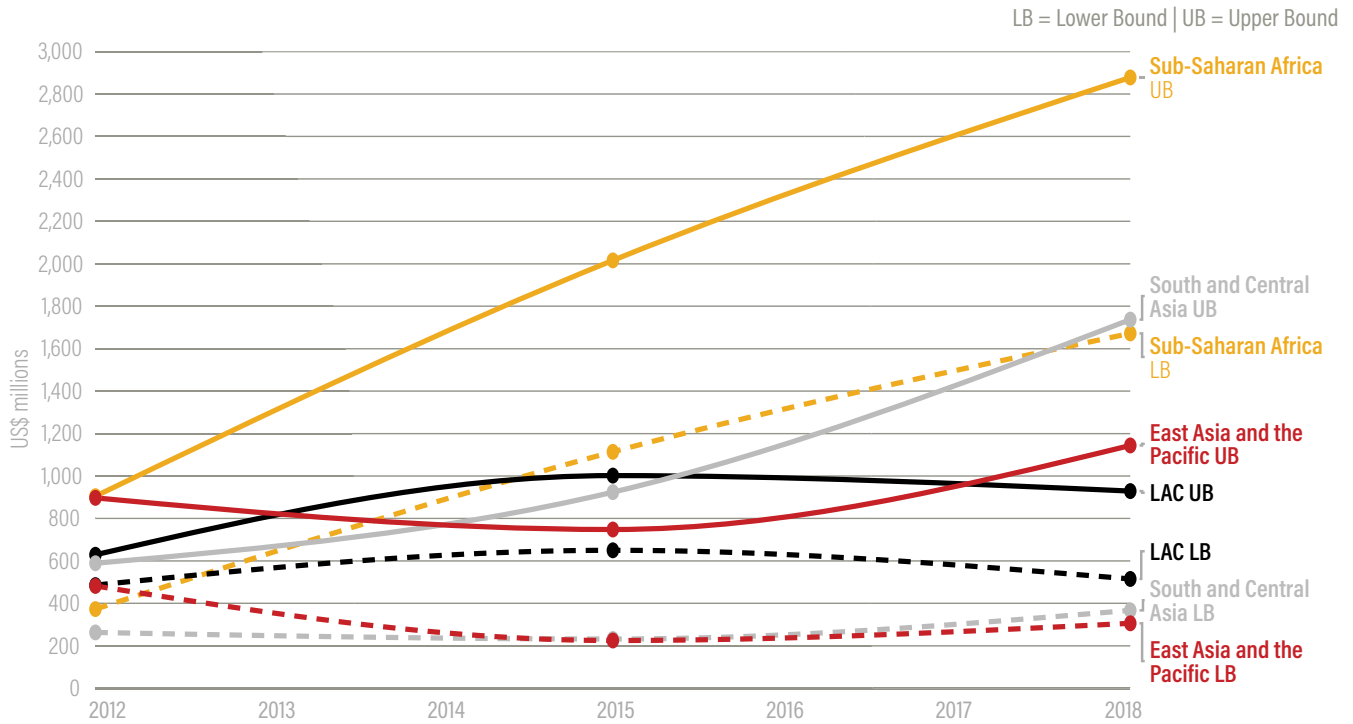
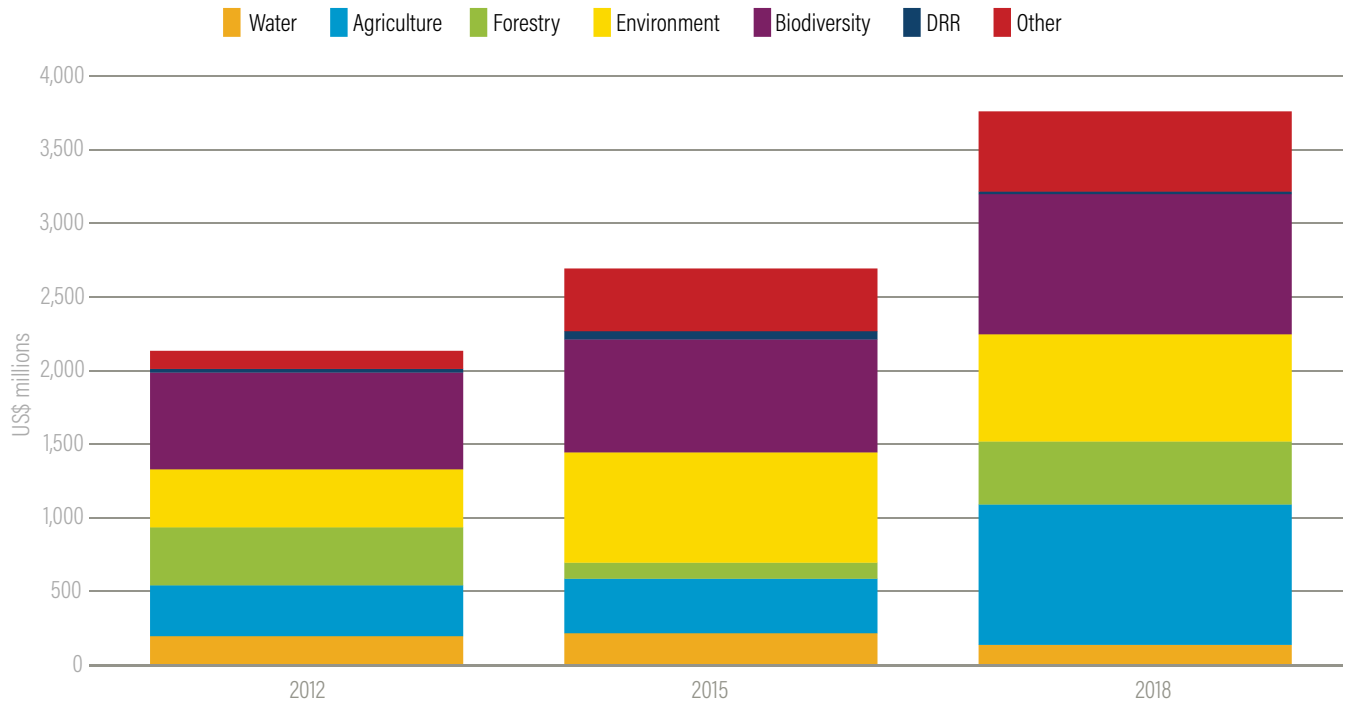


Figure 8 | ODA NbSA Funding Flows into Selected Sectors (Lower-Bound Only)



Notes: DRR = disaster risk reduction; LAC = Latin America and the Caribbean; NbSA = nature-based solutions for adaptation; ODA = official development assistance.

Source: Based on raw data from OECD.Stat database, Creditor Reporting System, modified by the authors.

Table 4 | List of Funds That Finance NbSA-Eligible Activities

	NAME OF THE FUND	YEAR ESTABLISHED	ESTIMATED AMOUNTS AVAILABLE (US\$MILLION)	SECTORS						PURPOSES			INSTRUMENTS ⁹	
				AGRICULTURE	BIODIVERSITY	DISASTER RISK REDUCTION	ENVIRONMENT	FORESTRY	WATER ^a	READINESS/CAPACITY BUILDING	PROJECT PREPARATION	IMPLEMENTATION		
MULTISECTORAL FACILITIES	Green Climate Fund (GCF)	2010	\$8,310										G,CF	
	International Fund for Agricultural Development (IFAD)^c	1977	\$8,200										G,CF	
	Global Environment Facility (GEF)	1992	\$4,100										G,CF	
	Least Developed Countries Fund (LDCF)	2001	\$1,600										G	
	Special Climate Change Fund (SCCF)	2001	\$350										G,CF	
	Adaptation Fund (AF)	2010	\$720										G	
	Global Agriculture and Food Security Program (GAFSP)	2010	\$1,600										G,CF	
	Climate Investment Funds (CIF)													
	Strategic Climate Fund (SCF)	2008	\$2,673											G,CF
	<i>Pilot Program for Climate Resilience (PPCR)</i>	2008	\$1,200											G,CF
	<i>Forest Investment Program (FIP)</i>	2009	\$723											G,CF
	ASEAN Catalytic Green Finance Facility^d	2019	\$1,000											CF
	International Climate Initiative (IKI)^e	2008	\$463											G
Natural Capital Finance Facility (NCF)^e	2015	\$147											G	
TARGETED NBS FACILITIES	Caribbean Biodiversity Fund (CBF)	2012	\$102											
	CBF's EbA Facility	2017	\$50											G
	KIWA Initiative^e	2018	\$36											G
	Global Fund for Ecosystem-based Adaptation^e	2020	\$23											

Notes: a. Refers to water resources and water security; b. G = grants, CF = concessional finance; c. IFAD is an executing agency of the GEF and GCF; d. ASEAN = Association of Southeast Asian Nations; e. Using a euro to U.S. dollar conversion rate of 1:1.172.

Source: The authors.

3. BARRIERS AND CHALLENGES

In a background paper for the Commission, the UNEP World Conservation Monitoring Centre identified several building blocks to underpin the widespread adoption of NbSA (see Figure 9):

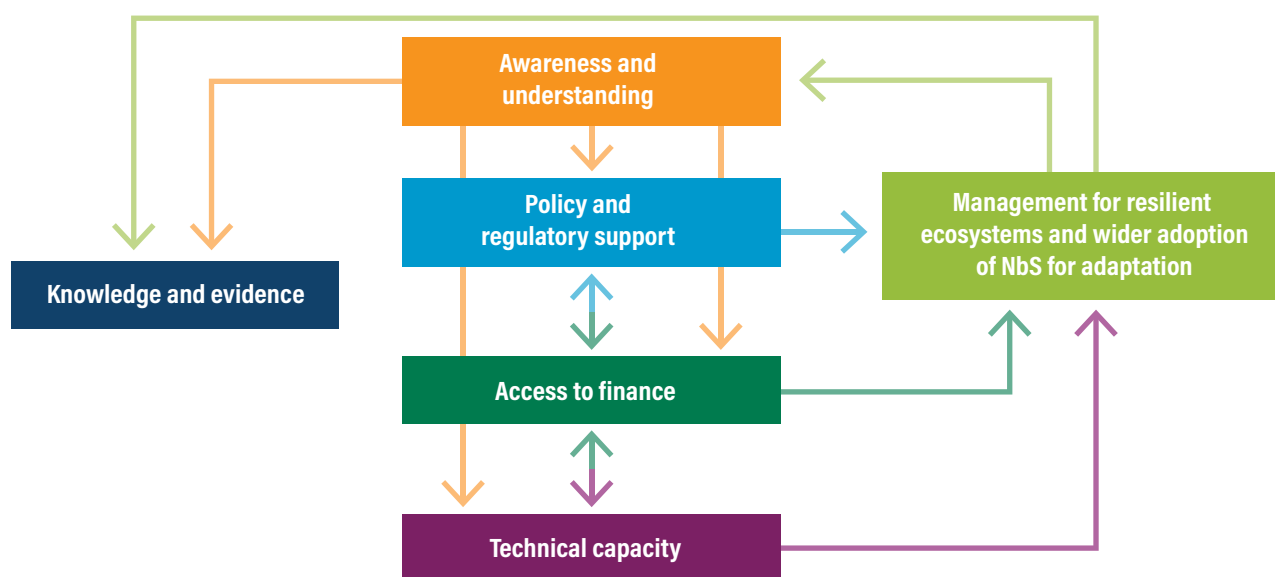
- **Awareness and understanding** of benefits among all stakeholders
- **Knowledge and evidence** base of the value and effectiveness of NbSA
- **Policy and regulatory support** or a good enabling environment
- **Access to finance** with sufficient volumes, from a wide range of sources, and in suitable types of financing instruments
- **Technical capacity** among all stakeholders to develop, design, fund/finance, and implement NbSA

These building blocks are meant to illustrate key needs for scaling up NbSA, including the development of successful NbSA investments. This paper touches on three of these building blocks, each of which responds to specific but interconnected barriers:¹²

- Barriers impeding **awareness and understanding** of NbSA benefits among stakeholders, which are driven by three key **knowledge**-related issues: the lack of definitions, data, and metrics.
- Barriers preventing **access to finance** for NbSA with sufficient volumes, from a wide range of sources, and in suitable types of financing instruments.

The barriers and challenges listed in this section are derived from the sources listed in Box 2.

Figure 9 | **The Building Blocks for Scaling Up NbSA**



Note: NbS = nature-based solutions.

Source: Modified from Kapos et al. 2019.

3.1 Barriers Impeding Awareness and Understanding

The lack of common definition, well-tagged information in the data sets, and clear metrics present significant overarching barriers to the adoption and scaling of NbSA (Figure 10). Interviewees consistently cited these issues, noting that they are interconnected and drive several other challenges related to NbSA financing.

3.1.1 No Common Definition of NbSA Exists

It was evident from the analysis of funding flows, and reinforced through interviews, that the definition of what qualifies as NbSA is unclear to many, suggesting that greater specificity and consistency is needed. One challenge is that project proponents often define such investments first and foremost by their core focus (e.g., biodiversity, water resources management) rather than in terms of adaptation outcomes. Box 1 lists several existing definitions of NbSA that may be helpful.

3.1.2 Clear Data on Funding for NbSA Is Lacking

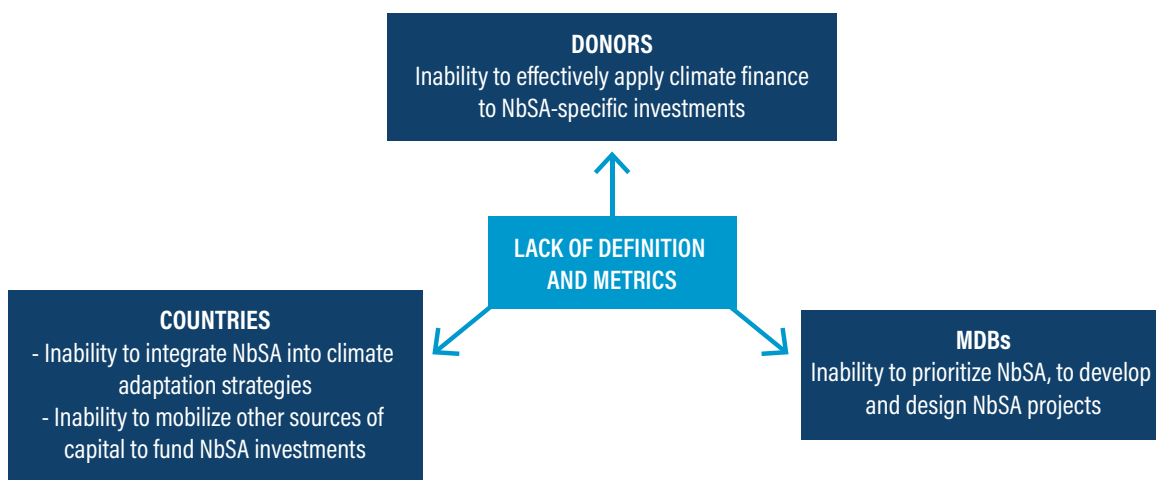
Clarifying what qualifies as NbSA will help support better tagging and data collection, which in turn will improve the tracking of funding for NbSA (UNEP 2021). Without an NbSA tag in the existing databases, many projects that may contribute to adaptation outcomes are not counted. The methodology employed in this paper captures

adaptation-related investments in specific sectors, but they may not be directly relevant to NbSA. The lack of a clear tag thus results in imperfect accounting, which makes it difficult to measure the amount of funding already flowing and to monitor its effectiveness, can make it difficult to fully meet the needs for NbSA and to raise additional funding (Somarakis et al. 2019).

3.1.3 No Clear Metrics Exist to Value NbSA

Although there are some systems, standards, and tools currently in development (see Box 5 in Section 5.3), as of now, no commonly agreed upon set of performance metrics to determine the impact of NbSA investments (individually or collectively) exists. The lack of commonly adopted metrics, as well as methodologies that can value the economic and financial benefits of these investments, has contributed to the inability of countries, project developers, and investors to appropriately appraise NbSA as an investment proposition against other options. These metrics and methodologies would enable project proponents to understand a range of important issues related to funding NbSA investments, such as life cycle operational costs and the values of adaptation benefits, which are important in developing approaches to mobilize additional capital.

Figure 10 | **Overarching Barriers: A Lack of Definitions and Metrics**



Note: MDB= multinational development bank; NbS = nature-based solutions.

Source: The authors.

3.2 Barriers Preventing Access to Finance

Barriers identified in this section are specific to donor and other international (excluding domestic) public sources of funding—in particular, those barriers that impact the sources (donor funding), the channels (intermediaries and climate funds), and the uses (recipient countries). The following outlines key barriers at each of these points within the financing landscape.

3.2.1 Donor Sources of Funding Are Insufficient in Volume

There is clearly an overall funding gap for adaptation (at least \$180 billion per year needed, against approximately \$30 billion in current flows), of which NbSA is a piece; and an overall funding gap for NbS, of which NbSA is also a piece. As mentioned earlier, donor/ODA funding for NbSA accounts for only 0.6–1.4 percent, or \$3.8–\$8.7 billion of total tracked climate finance flows, and a small portion of overall adaptation flows (tracked at \$42 billion).

3.2.2 Donor Sources of Funding Do Not Align with Needs

Donor funding is often provided in ways that may not meet the funding needs for NbSA investments in recipient countries. The assessment highlights the following specific barriers and challenges:

- **Available funding and allocated funding do not explicitly identify NbSA as a focal area.** This results in poor understanding by recipients of where to access funding for NbSA and poor tracking of funding flows for NbSA. The lack of clarity means that donors may be less able to understand the current levels of support for NbSA investments and to assess the effectiveness of existing funding and efficiently allocate additional funding.
- **Funding is predominantly grant-based and does not maximize options for catalyzing NbSA investments.** As previously noted, up to 80 percent of tracked funding was provided in the form of grants. Although grants are necessary and important—notably, to support capacity building, technical assistance, and project preparation—employing public capital in investment structures through both grant and nongrant instruments can allow for approaches that more effectively mobilize private investment.

3.2.3 Channels of Donor Funding Do Not Explicitly Promote NbSA

The channels of donor funding for climate action—and, by extension, NbSA—are key sources of information and funding for recipient countries. Although few funding channels explicitly promote NbSA investments, many large climate funds and multilateral agencies bundle NbS interventions under other adaptation-related sectors (e.g., disaster risk reduction or water), which can make it difficult to track NbSA investments. The following barriers prevent greater uptake of NbSA investments:

- **Existing funding channels rarely promote NbSA as an explicit investment priority.** Interviewees highlighted that funding channels do not clearly and consistently promote consideration or prioritization of NbSA options during project development phases. They noted that while broader NbSA-related options were discussed, it could be difficult to make a case for NbSA given the lack of clear definitions, metrics to assess costs and benefits, and incentives to choose NbSA over other options; in addition, NbSA options were not always prioritized by developing countries. Funding channels thus miss an opportunity to signal to recipients the potential value of developing such projects, and they miss the opportunity to support them in developing such projects, thus limiting pipeline development.
- **Funding modalities do not match funding needs.** Interviewees and research literature noted that for many NbSA investments, a mismatch exists between the modality of funding, either at the development stage (where primarily project development grants would be used) or at the investment stage, where a range of grant and investment instruments (e.g., debt, equity, results-based finance, etc.) could be useful (UNEP 2021). In particular, interviewees highlighted the need to support the relatively high operations and maintenance (O&M) costs of NbS projects over their lifetimes, especially in circumstances where NbSA projects have insufficient revenue streams to bear those costs.

3.2.4 Challenges in Developing the NbSA Pipeline Hinder Access to Financing

With more than 60 percent of all first NDCs including NbSA (Seddon et al. 2020b), there is clearly a latent demand for NbSA investment from developing countries. With the existing ambiguities around definitions and what “counts” as NbSA and the lack of clear signals within the system of funding (from both donors and channels), it is likely that the overall demand for NbSA investments is far greater than simply what exists within the collective NDCs today, yet the development of a pipeline that matches such demand is still lacking. The following is a list of barriers at the country level that prevent the development of a robust pipeline of NbSA investments in developing countries:

- **A general lack of awareness and understanding of NbS often exists among key stakeholders** (Somarakis et al. 2019). Governments must understand not only the benefits of NbSA but also how to mainstream NbSA into climate and development plans and how to develop, value, and structure NbSA investments. This is further compounded by the barriers around awareness and understanding because key stakeholders may not understand the (emerging) evidence around the potential uses of NbS; this is apparent, for instance, in how nonforest ecosystems are rarely included in NDCs (Seddon et al. 2019).
- **A lack of coordination between stakeholders can be problematic** because NbSA require relevant expertise to appraise and value the cobenefits across sectors. Interviewees noted that NbS often necessitates coordination and collaboration horizontally (across government departments), vertically (from policymakers to local communities and other stakeholders), and across geographical regions. This is challenging and increases the risk of failure if not executed well. Furthermore, government agencies most knowledgeable about NbSA are rarely those that make key planning and budgeting decisions.
- **NbS are not prioritized among potential categories of adaptation investment, leading to more limited demand from developing countries** (Egusquiza et al. 2019; Sarabi et al. 2020). Even when cited in NDCs and NAPs, NbS are often not prioritized in public budgets and investment plans. One reason for this is that government officials may feel pressure to deliver more immediate and tangible results, preferring familiar “gray” interventions that are easier to model in terms of benefits and are thus easier to structure from a funding perspective. Many interviewees noted that it was far easier to undertake a cost-benefit analysis for gray infrastructure projects than more comprehensive interventions like NbSA because of the lack of a common methodology for assessing the economic and financial benefits of NbSA and the cobenefits, even though NbSA can often be superior (Seddon et al. 2020a, 2020b).
- **It is difficult to prepare NbS investments, including assessing and internalizing the range of economic and financial benefits resulting from an NbS project** (Global Commission on Adaptation 2019). Many developing countries have difficulty assessing, valuing, and structuring NbS investments as well as undertaking the necessary stakeholder engagement to ensure successful investment and implementation.

4. OPPORTUNITIES AND PROMISING APPROACHES

Several examples have been identified through both interviews and research that highlight ways to address these barriers and contribute to the building blocks needed for scaling up the implementation of NbSA. These promising approaches can provide useful lessons and insights to funders, channels of funding, and developing countries (see Figure 11).

4.1 Policy and Regulatory Support

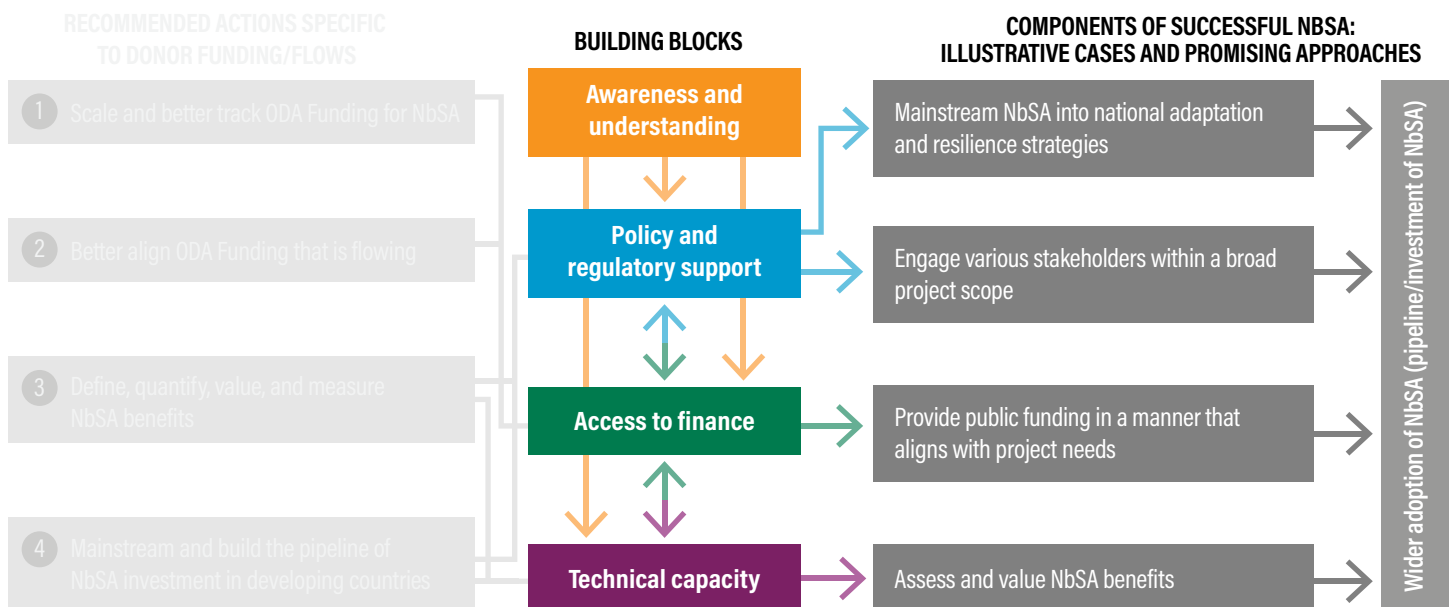
■ **Mainstream NbSA to address adaptation priorities.** Early identification and consideration of NbS options are essential to their implementation. Helping countries develop “green” and “gray/green” adaptation approaches alongside traditional “gray” solutions is a useful exercise; NbS approaches can be more cost-effective, have additional benefits (Seddon et al. 2020a, 2020b), and can also complement gray

infrastructure by reducing risk, lowering operational and capital costs, and providing redundancy benefits (Browder et al. 2019).

■ **Engage local and international stakeholders early in the process.** The crosscutting nature of NbSA necessitates robust and coordinated stakeholder engagement, including the following actions:

- Engaging local communities, indigenous title holders, and others to incorporate their perspectives.
- Involving policymakers and decision-makers from across relevant ministries and levels of government.
- Effectively coordinating donors to ensure funding is aligned with country needs and preferences.

Figure 11 | Four Promising Approaches to Scale the Implementation of NbSA



Note: NbSA = nature-based solutions for adaptation.

Source: Modified from Kapos et al. 2019.

4.2 Access to Finance

- **Provide public funding in a manner that aligns with project and/or investment needs.** Interviewees noted the particularities of NbSA that may require different funding approaches than those employed for traditional “gray” solutions. These approaches include the following:
 - The potential for results-based approaches (for example, payments for ecosystem services; see Appendix B for others) to deliver funding that has proved effective in catalyzing private investment.
 - The need to fund both capital expenditures (e.g., project development) and O&M expenditures. Some NbSA projects have little or no revenue streams to cover ongoing O&M costs, discouraging investment.
 - The potential use of public funding to anchor and/or de-risk project finance structures and, where possible, the use of blended finance approaches to enable NbSA investment.¹³

4.3 Technical Capacity

- **Assess and value NbSA benefits.** Given the gaps in knowledge about the economic, resilience, health, and other benefits of intact or restored ecosystems, NbSA options may be underappreciated by decision-makers, financiers, and beneficiaries. Resources are often needed to quantify value and measure outcomes.
 - **Quantify value.** Conduct quantified ex ante and ex post assessment/valuation and cost-benefit analysis to enable appropriate economic comparisons between NbSA and other investment options. This can help some stakeholders to recognize the systemic value that NbSA brings to different beneficiaries. See Box 5 in Section 5.3 for more details.
 - **Measure outcomes.** Track, monitor, and measure outcomes to strengthen the evidence base for the effectiveness and efficiency of NbSA. Coupled with strong valuation approaches, this will assist in building awareness and understanding of how NbS approaches (such as conservation and ecosystem restoration) can contribute to adaptation and other benefits.

The following examples illustrate how these promising approaches have been implemented.

Example 1 | Mangrove Restoration in Vietnam

PUBLIC FUNDING MODALITY	Grant
DATES	1994–2010
COUNTRY/REGION	Vietnam, South and Central Asia
SECTOR	Infrastructure; food security and rural livelihoods
HAZARDS ADDRESSED	Storm surge, flooding, sea level rise, drought
AMOUNT OF PUBLIC FUNDING	\$8.9 million
AMOUNT OF TOTAL FUNDING	\$8.9 million
FUNDERS	Danish Red Cross, Japanese Red Cross
COBENEFITS	Carbon sequestration, nutrient retention, sediment retention, biodiversity habitat, flood attenuation, wastewater treatment, water supply and recharge

BUILDING BLOCKS ADDRESSED

Policy and regulatory support

Access to finance

Technical capacity

Description: Afforestation with mangroves was considered an effective means to combat the loss of natural coastal protection by safeguarding sea dykes, reducing the risk of flooding, and protecting livelihoods. The project was implemented in eight coastal provinces in northern Vietnam from 1994 to 2010. Projects were implemented with the Vietnamese government's support and with efforts to involve local communities and stakeholders in the planning and development process; community ownership of the project was high. Capacity building was also an essential component of the project and included the training of local stakeholders and government officials. The project improved disaster preparedness for hundreds of communities, reduced extreme weather risks for millions of people, and had direct eco-

nomie benefits to families in those communities. Savings due to avoided risks was approximately \$15 million, resulting in a cost-benefit ratio (including ecological benefits) of 1:60.

Relevance for scaling the adoption of NbSA: This example provides strong evidence of the importance of ensuring methodologies for measurements and reporting metrics are developed ex ante and underpin economic cost-benefit and impact analysis. It also illustrates the importance of stakeholder engagement in terms of how the activity depended on cooperation between international organizations, the national government, and community-level staff and volunteers.

Example 2 | Water Funds in Peru

PUBLIC FUNDING MODALITY	Grant
DATES	2004-ongoing
COUNTRY/REGION	Peru, Latin America and the Caribbean
SECTOR	Water security and rural livelihoods
HAZARDS ADDRESSED	Storm surge, flooding, sea level rise, drought
AMOUNT OF PUBLIC FUNDING	\$1.7 million
AMOUNT OF TOTAL FUNDING	\$2 million, plus annual payments by private stakeholders
FUNDERS	DANIDA, DGIS, BMU, local private stakeholders, regional/local governments
COBENEFITS	Nutrient retention, sediment retention, biodiversity habitat, flood attenuation, water treatment, water supply and recharge

BUILDING BLOCKS ADDRESSED		
Policy and regulatory support	Access to finance	Technical capacity

Description: Three separate NbS interventions to improve watershed services in three regions in Peru were analyzed: engaging local communities to improve farming practices for better water capture, retention, use, and water flow; an appraisal of improved water management services and the consequent implementation of a payment for ecosystem services between watershed service providers and water users; and, through collaboration with local stakeholders and key private sector actors, the creation of a financial mechanism (Aquafondo) to generate public-private partnerships for investment in the three watersheds. Public finance was utilized for the initial implementation and launch of the projects; each of the three projects also includes financial mechanisms to incorporate private capital as payments for the continued water-related services generated and to ensure sustainable O&M.

Relevance for scaling the adoption of NbSA: The three interventions highlight the successful collaboration between national governments, international donors, nonprofit organizations, the private sector, and local communities to advance NbS for watershed management and adaptation and to implement sustainable financing mechanisms. These interventions also showcase the assessment and valuation of ecosystem services, which supported the successful monetization of improved sustainability measures on water resources, with water users providing payments to watershed service providers.

Example 3 | Debt-for-Nature Swaps in Seychelles

PUBLIC FUNDING MODALITY	Grant, loan, sovereign debt discount
DATES	2011-15
COUNTRY/REGION	Seychelles, Sub-Saharan Africa
SECTOR	Food security, flood and coastal protection
HAZARDS ADDRESSED	Sea level rise, ocean acidification, storm surge
AMOUNT OF PUBLIC FUNDING	\$21.6 million
AMOUNT OF TOTAL FUNDING	\$21.6 million
FUNDERS	Belgium, France, Italy, the United Kingdom (under the Paris Club), The Nature Conservancy, various philanthropic organizations
COBENEFITS	Habitat for fish species, biodiversity conservation, disaster risk reduction

BUILDING BLOCKS ADDRESSED

Policy and regulatory support

Access to finance

Technical capacity

Description: The project aimed to sustainably finance and promote marine conservation efforts in Seychelles while easing the country's public debt burden. The Seychelles Conservation and Climate Adaptation Trust (SeyCCAT) was created to raise grant and loan capital for marine conservation. It purchased \$21.6 million of Seychelles' sovereign debt with \$5 million in grant funding (primarily from philanthropies), a \$15.2 million loan from The Nature Conservancy (TNC) repayable at 3 percent over 10 years, and a \$1.4 million discount on Seychelles' debt negotiated through the Paris Club (93.5 cents on the dollar). SeyCCAT committed over the next 20 years to disbursing \$280,000 per year for marine conservation and climate adaptation activities and investing \$150,000 per year in endowment to fund future conservation efforts.

Relevance for scaling the adoption of NbSA: This is an example of how public capital can be used to repurpose an existing expenditure stream into paying for conservation and adaptation instead of just paying down debt. It highlights all core building blocks: it identifies NbSA (a debt-for-nature swap to reduce sovereign debt while preserving natural capital and increasing resilience to climate impacts); assesses the impact of the intervention; and clearly engages international, national, and local stakeholders to secure permanent funding for both the initial capital and continued operational costs of the project.

Example 4 | Insuring Natural Capital—Coral Reef Insurance in Mexico

PUBLIC FUNDING MODALITY	No data
DATES	2018–ongoing
COUNTRY/REGION	Latin America and the Caribbean
SECTOR	Disaster risk reduction, infrastructure
HAZARDS ADDRESSED	Increasing temperatures, sea level rise, tropical cyclones
AMOUNT OF PUBLIC FUNDING	\$3.8 million insurance cover
AMOUNT OF TOTAL FUNDING	No data
FUNDERS	SwissRe, TNC, local/regional governments, local private stakeholders
COBENEFITS	Habitat for fish species, biodiversity conservation

BUILDING BLOCKS ADDRESSED

Policy and regulatory support	Access to finance	Technical capacity
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Description: The Coastal Zone Management Trust was established by the state government of Quintana Roo in Mexico with the participation of Mexico’s National Commission of Natural Protected Areas, TNC, and partners in the local science community and tourism industry to purchase an insurance-for-nature policy provided by SwissRe. The policy allows the trust to secure funding for ongoing maintenance and to quickly repair damages to the state’s coral reef following a hurricane, preventing long-term damage and enhancing the protection of onshore communities. The project recently paid out \$850,000 to fund reef restoration after Hurricane Delta in October 2020.

Relevance for scaling the adoption of NbSA: The Coastal Zone Management Trust receives funds from an existing fee paid by beachfront property owners, among other private and public sources, to enable the community to advance communal NbS. This project highlights all building blocks: it clearly identifies NbS; assesses, values, and monetizes the natural capital in place; engages international and local stakeholders; and secures funding to protect and maintain the valuable natural asset.

5. RECOMMENDATIONS

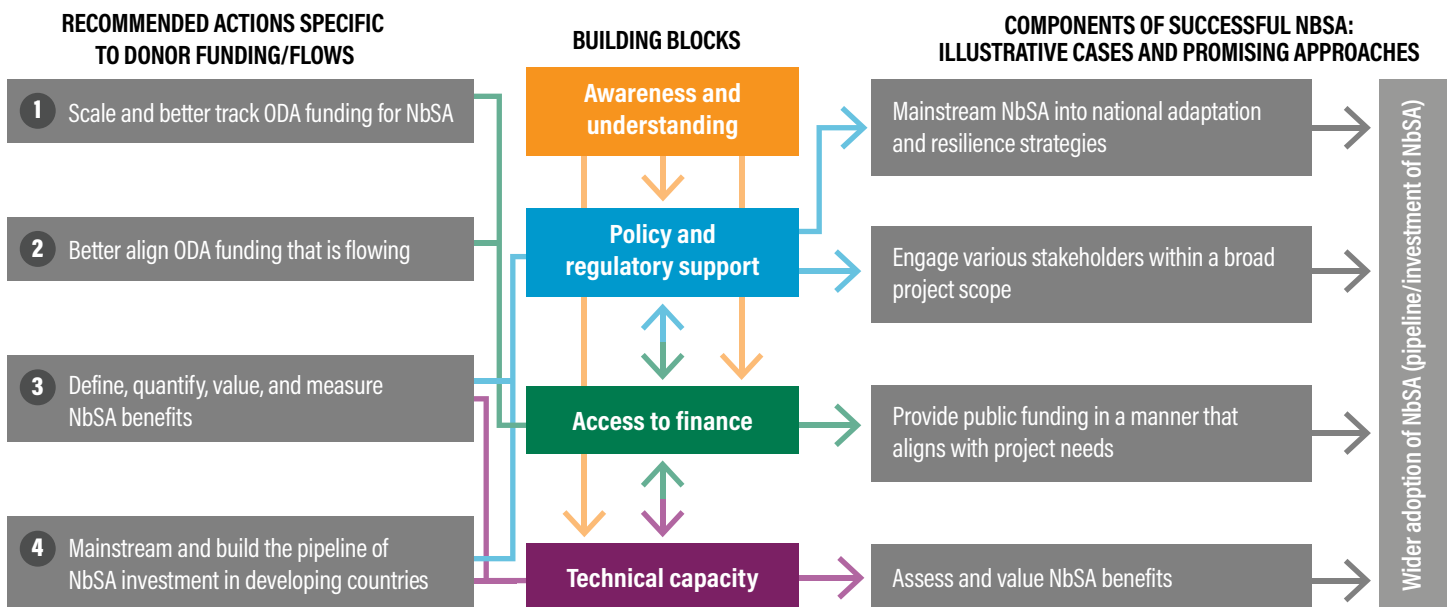
Public international sources of capital can help build the necessary foundations for the successful implementation and scaling up of NbSA, address critical barriers preventing all types of funding from flowing, and accelerate the development of an investment pipeline. The recommended actions described below (and in Figure 12) are aimed at two primary stakeholder groups:

- **Donors.** Public international donors that provide ODA and climate finance for NbSA as well as some related technical assistance and capacity building.
- **Channels.** Institutions like MDBs and international climate funds that are important channels of NbSA funding and can encourage countries to integrate NbSA into investment plans and undertake NbSA investments while helping them build the knowledge and capacity to do so.

Some of the recommendations also apply to developing countries insofar as those countries have a similar need to adopt definitions, metrics, and methodologies for NbSA and to develop and design fundable NbSA investments.

The recommended actions flow from the barriers identified in Section 3 and the promising approaches described in Section 4, which resulted from analysis of the data on funding flows as well as from interviews with key stakeholders, including donors, developing countries, and others. They also build on the Commission's *Adapt Now* report, focusing on specific recommendations for public international donor funding of ODA to support greater scale and effectiveness of NbSA. They are meant to complement recommendations from other recent reports, including those that focus on issues necessary to increase the mobilization of private capital for NbS more generally (see Box 4 for more details).

Figure 12 | This Paper's Recommendations (as They Relate to Previous Analysis for the Global Commission on Adaptation)



Notes: NbSA = nature-based solutions for adaptation; ODA = official development assistance.

Source: Modified from Kapos et al. 2019.

Box 4 | Recent Reports on Catalyzing Private Investment for Nature-based Solutions

Several recent reports highlight initiatives and provide recommendations on increasing the mobilization of private capital for nature-based solutions (NbS). Below is a list of several reports with their key findings.

REPORT	KEY FINDINGS
Inter-American Development Bank: <i>Nature-Based Solutions: Increasing Private Sector Uptake for Climate-Resilience Infrastructure in Latin America and the Caribbean</i> ^a	<ul style="list-style-type: none"> • Raise awareness of NbS and enhance capacity to integrate NbS into decision-making within ministries responsible for planning, financing, and implementing infrastructure projects. • Build capacity by providing tools and opportunities to develop technical skill sets. • Stakeholders need to develop the business case to drive demand for financial products that can support NbS. • Multilateral development banks can develop and deploy innovative instruments to finance and refinance NbS.
Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability: <i>Financing Nature: Closing the Global Biodiversity Financing Gap</i> ^b	<ul style="list-style-type: none"> • Build capacity in assessing how investment decisions impact biodiversity; manage and disclose biodiversity risk. • Develop robust evidence on the costs and performance of different forms of natural infrastructure. • Develop internal policies and performance metrics that incentivize the structuring, offering, and use of financial products with explicit benefits to biodiversity.
World Bank: <i>Mobilizing Private Finance for Nature</i> ^c	<ul style="list-style-type: none"> • The financial sector should develop its own standards and good practices for incorporating biodiversity risk into investment decisions. • Financial mechanisms need to be developed to increase the return or cash flow of investments.
TNC and <i>Environmental Finance: Investing in Nature: Private Finance for Nature-based Resilience</i> ^d	<ul style="list-style-type: none"> • Value and measure: adopt natural capital accounting to keep track of stocks and flows. • Structure: larger investment vehicles are urgently needed to enable investment at scale. • Facilitate: greater awareness and understanding of the role of natural capital and of the profit opportunities it offers. • Incentivize and regulate: financial industry regulators can provide guidance and help to manage the economic implications of biodiversity loss.

Sources: a. Watkins et al. 2019; b. Deutz et al. 2020; c. Blarel et al. 2020; d. Cooper and Trémolet 2019.

5.1 Action #1: Scale and Better Track ODA Funding for NbSA

Given the likely significant funding gap between estimated flows and overall investment needs for NbSA, donors should prioritize and scale up their climate finance and ODA commitments for NbSA. The following

is a list of actions specifically focused on how donors and channels of NbSA can scale and better track public international funding for NbSA, with the involvement of developing countries.

ACTOR	RECOMMENDED ACTIONS
Donors	<ul style="list-style-type: none"> ▪ Define. Adopt common definitions of NbSA and apply the Rio markers more rigorously and consistently. ▪ Demand and promote better measurement. Ensure that channels of ODA for NbSA measure investments effectively. <ul style="list-style-type: none"> ▪ Accurately track NbSA investments, even when they are crosscutting with and/or embedded in other development impact areas or undertaken for a different primary purpose (such as biodiversity, forestry, or water management). ▪ Adopt consistent methodologies, such as the International Institute for Sustainable Development's Sustainable Asset Valuation (SAVi) tool, to enable greater measurement of cobenefits as well as impacts and successes from NbSA. ▪ Allocate more climate finance/ODA for NbSA. <ul style="list-style-type: none"> ▪ Increase allocations to MDBs and multilateral climate funds and/or specific dedicated NbS funding mechanisms, particularly those that can deploy capital most efficiently and with speed, particularly to meet latent and future demands for NbSA. ▪ Actively monitor results. Ensure that channels for NbSA and broader NbS funding <ul style="list-style-type: none"> ▪ integrate indicators for NbSA cobenefits within monitoring and evaluating (M&E) frameworks; and ▪ monitor and track NbSA results, including as part of crosscutting interventions.
MDBs/ international climate funds and other channels	<ul style="list-style-type: none"> ▪ Prioritize and identify NbSA. Support and engage in the ongoing development of emerging criteria and standards for NbSA best practices,¹⁴ and apply them to support the identification of promising NbSA projects in the pipeline. ▪ Actively monitor results. Ensure that countries specifically: <ul style="list-style-type: none"> ▪ integrate indicators for NbSA cobenefits within M&E frameworks; and ▪ monitor and track NbSA results, including as part of crosscutting interventions.
Developing countries	<ul style="list-style-type: none"> ▪ Prioritize and identify NbSA. Work with donors, MDBs, and civil society on the development of criteria and standards for NbSA best practices and apply them to support the identification of promising NbSA projects that are aligned with national climate plans (e.g., NDCs and NAPs).

5.2 Action #2: Better Align ODA Funding That Is Flowing

Public international funding for NbSA is primarily provided in the form of grants.¹⁵ Although important, this reliance on grants may limit opportunities to catalyze other forms of capital for NbSA, including by using concessional finance to crowd in private capital. Interviewees noted two potential additional ways that public international funding can be useful for NbSA projects:

- **Grants for long-term O&M costs.** Interviewees noted potential mismatches between funding available for capital costs and the need for NbSA to cover longer-term O&M costs. This mismatch is particularly challenging for projects with low or no revenue streams to cover these costs. Lack of visibility on how these O&M costs are covered can be decisive in investment decisions.

- **Concessional and nongrant instruments.** Utilizing public international funding through nongrant instruments (e.g., guarantees, concessional debt, and equity) to help crowd in private capital is common among many climate-related sectors. Many interviewees suggested that innovative approaches to catalyze private investment in NbSA would benefit from greater access to public international funding.

The following actions specifically focus on how donors and channels of NbSA, as well as developing countries, can better align public international funding for NbSA project needs.

ACTOR	RECOMMENDED ACTIONS
Donors	<ul style="list-style-type: none"> ■ Broaden (funding) support. Provide guidance on risk tolerance and authorize funding channels, where possible, to use funding in both grant and nongrant investment instruments to support <ul style="list-style-type: none"> ▪ all relevant costs, including long-term project costs, such as O&M costs; and ▪ taking greater risk/higher risk tolerance in order to crowd in private investment. ■ Coordinate and align. Improve the coordination among donors and donor-led initiatives to ensure NbSA-related funding is aligned with country needs, especially through the early engagement of national and local stakeholders.
MDBs/ international climate funds and other channels	<ul style="list-style-type: none"> ■ Align with country needs. Ensure support provided to developing countries is aligned with national plans and budgets and promote the mainstreaming of NbSA to address adaptation needs. ■ Facilitate NbSA project planning. Given the crosscutting nature of NbSA, help countries coordinate NbSA project planning and development among agencies. Ensure the early engagement of local communities, relevant ministries, and other stakeholders and levels of government as appropriate. ■ Mobilize. Actively employ blended finance approaches to leverage, crowd in, and otherwise mobilize private and philanthropic capital into NbSA investments. (See examples in Appendix B.) ■ Broaden (funding) support. Ensure instruments that address funding and financing gaps in NbSA projects, including those that employ results-based financing approaches, allow for payment of both capital expenditures and O&M costs. ■ Build capacity. Fully fund, through grants, important technical assistance, awareness and knowledge, capacity building, and project development efforts.
Developing countries	<ul style="list-style-type: none"> ■ Be strategic with, and maximize the impact of, ODA received to accelerate NbSA investments. Take a strategic view on how best to utilize ODA and other public funding to accelerate NbSA investment, including employing approaches to blend public capital that mobilize private capital for eligible projects where feasible.

5.3 Action #3: Define, Quantify, Value, and Measure NbSA Benefits

The absence of clear definitions, guidelines, and metrics and methodologies to track, quantify, and value NbSA benefits may contribute to the relative scarcity of the right types of capital (both grant and nongrant/investment capital), which in turn may significantly inhibit the development of a robust pipeline of NbSA-related investments by public and private sectors.

Thus, the single most important technical gap that, if addressed, may facilitate greater NbS financing is the need to develop, adopt, and accelerate a common approach to define, quantify, value, and measure NbSA benefits in ways that are meaningful for investment decision-making, including quantifying (economic and financial) values

for NbSA outcomes for public and private investors and countries. Such a framework (e.g., monitoring, reporting, and verification [MRV] for NbSA) will be foundational to increase evidence and awareness, shift planning and policy, and stimulate pipeline development and financing for NbSA; thus, it is a critical component for scaling up these types of investments.

Several efforts are attempting to develop methodologies for quantifying NbS benefits (see Box 5), including for adaptation. The following table provides recommendations for how donors and channels, as well as developing countries, can support the development of these approaches and accelerate their adoption.

ACTOR	RECOMMENDED ACTIONS
Donors	<ul style="list-style-type: none"> ▪ Value/quantify. Fund the development and adoption of approaches (e.g., MRV for NbSA) that articulate metrics and quantify avoided costs and/or the value of protecting nature, including those that build financial modeling capacity within both public and private investors. ▪ Fund/support the expedited development, adoption, and application of the Task Force on Nature-related Financial Disclosures approach to quantifying nature-related financial risks (or others), which can help public and private investors integrate financial measures into structuring decisions.
MDBs/ international climate funds and other channels	<ul style="list-style-type: none"> ▪ Employ methodologies that quantify NbSA benefits for <ul style="list-style-type: none"> ▪ public stakeholders, including developing country governments that often need to quantify costs and benefits in economic development terms over long time horizons; and ▪ private investors, including lenders and others whose funds may be mobilized and who often need to quantify financial returns of their investments over shorter time horizons relevant for their investment approaches and return expectations.
Developing countries	<ul style="list-style-type: none"> ▪ Engage and adopt. Work with donors, MDBs, and civil society on the development of useful and relevant methodologies for quantifying NbSA benefits, testing and piloting best practices and frameworks where appropriate. Adopt these methodologies, when possible, to inform project/pipeline development, continuing to build the evidence base for NbSA.

Box 5 | Examples of Standards, Tools, Metrics, and Valuation Methodologies for Nature-based Solutions

Task Force on Nature-related Financial Disclosures (2021)

Composed of several international financial institutions and governments, this initiative aims to develop a framework to assess, quantify, and disclose nature-related financial risks. Currently still an informal working group, this initiative is expected to launch in the first half of 2021.

Natural Capital Finance Alliance (NCFA), Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE) (2018)

A tool that aims to help financial institutions in their understanding, assessment, and integration of natural capital considerations into their decision-making. ENCORE provides information to allow portfolio screening and the management of natural capital risks and opportunities.^a

Coalition for Private Investment in Conservation (CPIC), Blueprints (2018)

CPIC, which is a global multistakeholder group composed of investors, banks, project developers, nongovernmental organizations, and research institutions, has developed a series of "blueprints" of model financial transaction structures that aim to facilitate the replication and scaling of investments that deliver both economic and conservation returns.^b

Notes: a. See NCFA's ENCORE website, <https://encore.naturalcapital.finance/en>; b. Note that although CPIC does not explicitly focus on nature-based solutions for adaptation, conservation can bring mitigation and adaptation benefits as well.

Sources: Bassi et al. 2019, 2020; Cooper and Trémolet 2019; CPIC n.d.

International Institute for Sustainable Development (IISD), Sustainable Asset Valuation (SAVi) tool: Natural Infrastructure (2019)

Together with the MAVA Foundation, the IISD developed the SAVi methodology to assist policymakers and investors in making informed infrastructure financing decisions. The methodology takes into account environmental, social, economic, and governance factors across the full life cycle of the project. SAVi not only considers the economic, social, and environmental risks and their associated costs to the financial performance of the project but also identifies and captures externalities that may not be reflected in traditional valuation methods.

A recently launched Global Environment Facility project aims to systematically and rigorously assess the economic and financial value of nature-based infrastructure. It will strengthen the IISD SAVi tool to integrate climate change adaptation by using a systems-based financial modeling and integrating climate data from the Copernicus Climate Data Store. The resulting data and valuation models will then be disseminated to build capacity and technical knowledge.

5.4 Action #4: Mainstream and Build the Pipeline of NbSA Investment in Developing Countries

There is clearly latent demand for NbSA funding given the number of countries including such projects in their NDCs and NAPs. However, whether those projects can be realized and whether countries are expanding the application of NbSA to address adaptation needs is unclear. Funding should help countries develop and

strengthen NbSA concepts to make them a reality and build a pipeline of new and additional NbSA investments. The following table provides suggestions for how both donors and channels can target grant funding for critical capacity building—both at the national and subnational levels—to increase the pipeline of NbSA investments.

ACTOR	RECOMMENDED ACTIONS
Donors	<ul style="list-style-type: none"> ▪ Build capacity. Ensure sufficient funding for technical assistance and capacity building efforts for all countries and project developers to design NbSA investments.
MDBs/ international climate funds and other channels	<ul style="list-style-type: none"> ▪ Help countries mainstream NbSA. By leveraging existing tools and technical assistance support, expand the resources and support available to help countries to mainstream NbSA, including <ul style="list-style-type: none"> ▪ at the national level, into existing country strategies and plans related to adaptation and development, including post-COVID recovery plans; and ▪ at the subnational level, into infrastructure investments being made by municipalities and local communities, where appropriate. ▪ Develop explicit capacity building programs to <ul style="list-style-type: none"> ▪ help developing countries integrate NbSA into NDCs and adaptation policies and plans; ▪ provide project preparation funding and technical assistance to help countries and subnational entities design NbSA projects, including technical design, impact analysis, and valuation of NbSA benefits (economic and financial); and ▪ provide specific support to help countries and subnational entities develop the financial structuring and investor proposition for NbSA, including life cycle analysis and operating costs. ▪ Provide grants and technical support for countries and subnational entities to ensure comprehensive stakeholder engagement for NbSA investments.
Developing countries	<ul style="list-style-type: none"> ▪ Strengthen the mainstreaming of NbSA to meet climate adaptation objectives, especially through the integration of NbS and NbSA in updates to country NDCs, NAPs, and other “green economy” or climate-related planning. ▪ Work with donors, MDBs, and other funding channels to develop a tangible pipeline of NbSA investments, moving from conceptualization to design, structuring, and implementation.

6. CONCLUSION

The results of this research show there is a long way to go to improve overall flows for NbSA and, in turn, to see NbSA investments realized and implemented in developing countries. Although the funding landscape shows low levels of funding today, donor and country interest in NbSA has accelerated rapidly in recent years. It is likely that future assessments will paint a different picture, including where funding is flowing from and which countries and regions are receiving support.

Research and interviews have highlighted how much work is needed to define and quantify NbSA at the project investment level, and there is growing interest across the donor and multilateral development community to invest in the necessary methods, tools, and approaches that can support scaling up NbSA investment. It is widely accepted that investments in NbSA support public goods that enhance the ability of countries and communities to adapt to climate change and to better withstand disasters when they occur.

For developing countries where domestic budgets may be constrained, an immediate and important opportunity exists to integrate NbS investments (writ large) into post-COVID economic recovery planning to reap a range of immediate and long-term climate resilience benefits. Furthermore, doing so has the potential to bring about a more robust (and resilient) post-COVID recovery, increase economic growth, create jobs, and yield other long-term positive development impacts.

Today, public capital is often still a decisive factor in determining whether an NbSA project is implemented and its benefits realized. Investing in NbSA at scale will require both greater investment levels from public and private sources and, importantly, improved coordination among many stakeholders, including developing country policymakers and planners, project developers, and communities, all of whom have diverse interests and incentives. This coordination is key, in part because the crosscutting nature of NbSA can make such interventions more complex. The need to build the capacity of all of these stakeholders to develop investable NbSA project pipelines cannot be overstated.

This paper's recommended actions provide an initial road map that can help each of these stakeholders build the right systems, approaches, and tools to enable the scaling up of NbSA investments while maximizing both the effectiveness of donor funding for NbSA and the ability of developing countries to become resilient in the face of climate change.

APPENDIX A: METHODOLOGY

This paper seeks to estimate donor funding for NbSA through traditional development assistance channels. Estimates are based on the OECD’s CRS database, which tracks ODA and nonconcessional development finance flows. These include the bilateral outflows provided by donors, primarily the OECD’s Development Assistance Committee (DAC) members, and plurilateral/multilateral fund and institution outflows to recipient countries.

CRS projects are classified by sector. Donors and donor agencies tag some of these projects with the Rio markers, which indicate either the primary or significant intent of the funding, such as mitigation, adaptation, or biodiversity. Sector classifications are exclusive—a funding flow cannot be tagged with more than one sector. Markers are not exclusive—funding flows can be tagged with more than one marker.

The authors used the following methodology to estimate total NbSA flows:

- A list of sectors was selected that encompasses likely NbS projects (see Table A1 for the full list of sectors).
- Projects were filtered from these sectors, counting those marked with both adaptation and biodiversity markers to produce a lower-bound estimate.
- Projects tagged as adaptation only were used to produce an upper-bound estimate.
- Committed flows for NbSA were then calculated for 2012, 2015, and 2018 (the most recent year available).

The lower-bound estimates do not include funding from and through multilateral channels, such as MDBs or climate funds, given how multilateral data is reported to the OECD.

When reporting climate finance data, additional coefficients are sometimes applied to discount projects marked as *significant* versus those marked *principal*. For example, some donors report 100 percent of the commitment for projects marked as *principal*, while a smaller share (varying between 0 percent and 100 percent) is reported for significant flows (OECD n.d.). Following the practice of these donors, 100 percent of amounts for flows marked *principal* have been reported, whereas a coefficient of 50 percent was applied to flows marked *significant*.

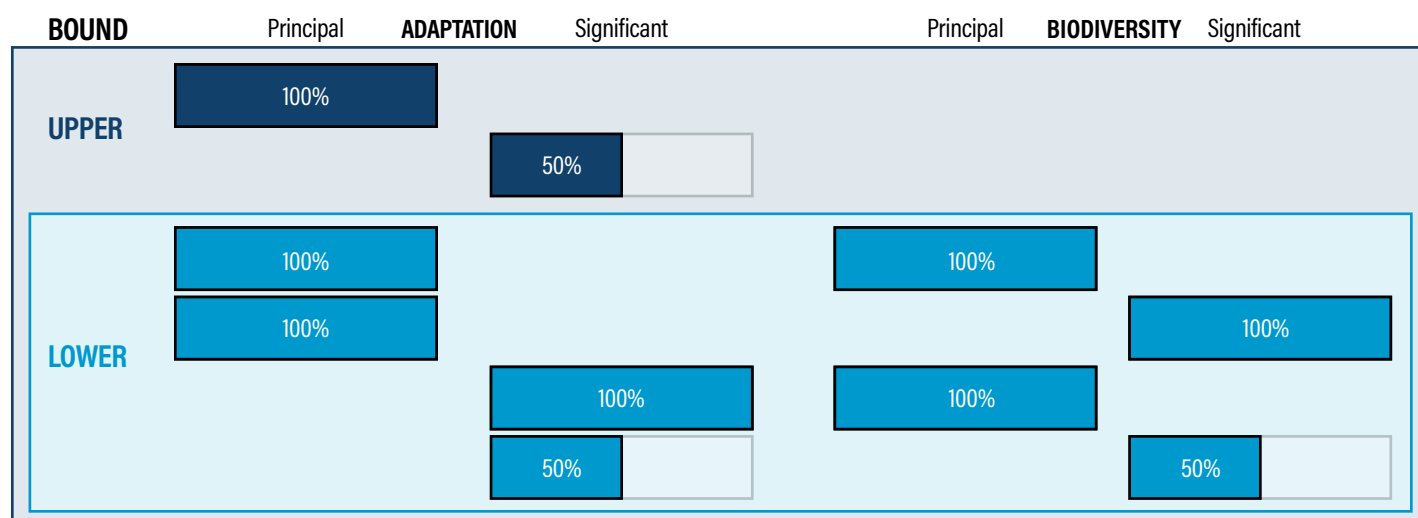
In summary, the upper and lower bounds were constructed as follows:

- Lower bound:
 - Projects marked with both adaptation and biodiversity Rio markers.
 - All reported at 100 percent unless both markers are *significant*, in which case the project value is discounted 50 percent.
- Upper bound: The upper bound encompasses the lower bound as a baseline; in addition, the following flows were added:
 - Projects marked as having either a principal or significant focus on adaptation and no focus on biodiversity.
 - Projects marked *principal* were reported at 100 percent.
 - Projects marked *significant* were reported at 50 percent.

These bounds are summarized in Figure A1.

Without a clear definition or marker for NbS writ large, this methodology can only **estimate flows toward projects that are likely related to NbSA**; thus, all flows derived are not necessarily representative of actual flows for NbSA projects.

Figure A1 | Summary of Reporting Coefficients for Upper-/Lower-Bound Analysis



Source: Climate Finance Advisors.

Table A1 | **List of OECD DAC CRS Sector Codes Included**

DAC 5	CRS	VOLUNTARY CODE	DESCRIPTION	CLARIFICATIONS/ADDITIONAL NOTES ON COVERAGE
CODE	CODE			
140			WATER SUPPLY & SANITATION	
	14010		Water sector policy and administrative management	Water sector policy and governance, including legislation, regulation, planning, and management as well as transboundary management of water; institutional capacity development; activities supporting the Integrated Water Resource Management approach.
	14015		Water resources conservation (including data collection)	Collection and usage of quantitative and qualitative data on water resources; creation and sharing of water knowledge; conservation and rehabilitation of inland surface waters (rivers, lakes etc.), groundwater, and coastal waters; prevention of water contamination.
	14040		River basins development	Infrastructure-focused integrated river basin projects and related institutional activities; river flow control; dams and reservoirs (excluding dams primarily for irrigation [31140] and hydropower [23220] and activities related to river transport [21040]).
310			AGRICULTURE, FORESTRY, FISHING	
311			AGRICULTURE	
	31110		Agricultural policy and administrative management	Agricultural sector policy, planning, and programs; aid to agricultural ministries; institution capacity building and advice; unspecified agriculture.
	31120		Agricultural development	Integrated projects; farm development.
	31130		Agricultural land resources	Including soil degradation control; soil improvement; drainage of water-logged areas; soil desalination; agricultural land surveys; land reclamation; erosion control, desertification control.
	31140		Agricultural water resources	Irrigation, reservoirs, hydraulic structures, ground water exploitation for agricultural use.
312			FORESTRY	
	31210		Forestry policy and administrative management	Forestry sector policy, planning, and programs; institution capacity building and advice; forest surveys; unspecified forestry and agroforestry activities.
	31220		Forestry development	Afforestation for industrial and rural consumption; exploitation and utilization; erosion control, desertification control; integrated forestry projects.
	31261		Fuelwood/charcoal	Sustainable forestry development with the primary purpose of producing fuelwood and charcoal. Further transformation of biomass in biofuels is coded under 32173.
	31281		Forestry education/training	
	31282		Forestry research	Including artificial regeneration, genetic improvement, production methods, fertilizer, harvesting.

Table A1 | List of OECD DAC CRS Sector Codes Included (Cont.)

DAC 5	CRS	VOLUNTARY CODE	DESCRIPTION	CLARIFICATIONS/ADDITIONAL NOTES ON COVERAGE
CODE	CODE			
313			FISHING	
	31310		Fishing policy and administrative management	Fishing sector policy, planning, and programs; institution capacity building and advice; ocean and coastal fishing; marine and freshwater fish surveys and prospecting; fishing boats/equipment; unspecified fishing activities.
410			GENERAL ENVIRONMENTAL PROTECTION	
	41010		Environmental policy and administrative management	Environmental policy, laws, regulations, and economic instruments; administrative institutions and practices; environmental and land-use planning and decision-making procedures; seminars, meetings; miscellaneous conservation and protection measures not specified below.
	41020		Biosphere protection	Air pollution control, ozone layer preservation; marine pollution control.
	41030		Biodiversity	Including natural reserves and actions in the surrounding areas; other measures to protect endangered or vulnerable species and their habitats (e.g., wetlands preservation).
	41081		Environmental education/training	
	41082		Environmental research	Including establishment of databases, inventories/accounts of physical and natural resources; environmental profiles and impact studies if not sector specific.
430			OTHER MULTISECTOR	
	43010		Multisector aid	
	43030		Urban development and management	Integrated urban development projects; local development and urban management; urban infrastructure and services; municipal finances; urban environmental management; urban development and planning; urban renewal and urban housing; land information systems.
		43031	Urban land policy and management	Urban development and planning; urban management, land information systems.
		43032	Urban development	Integrated urban development projects; local development; urban infrastructure and services; municipal finances; urban environment systems; urban renewal and urban housing.
	43040		Rural development	Integrated rural development projects (e.g., regional development planning); promotion of decentralized and multisectoral competence for planning, coordination, and management; implementation of regional development and measures (including natural reserve management); land management; land-use planning; land settlement and resettlement activities (excluding resettlement of refugees and internally displaced persons [72010]); functional integration of rural and urban areas; geographical information systems.
		43041	Rural land policy and management	Regional development planning; promotion of decentralized and multisectoral competence for planning, coordination, and management; land management; land-use planning; geographical information systems.
		43042	Rural development	Integrated rural development projects; implementation of regional development and measures (including natural reserve management); land settlement and resettlement activities (excluding resettlement of refugees and internally displaced persons [72010]); functional integration of rural and urban areas.

Table A1 | List of OECD DAC CRS Sector Codes Included (Cont.)

DAC 5 CODE	CRS CODE	VOLUNTARY CODE	DESCRIPTION	CLARIFICATIONS/ADDITIONAL NOTES ON COVERAGE
	43060		Disaster risk reduction	Disaster risk reduction activities if not sector specific. Comprises risk assessments, structural prevention measures (e.g., flood prevention infrastructure), preparedness measures (e.g., early warning systems), normative prevention measures (e.g., building codes, land-use planning), and risk transfer systems (e.g., insurance schemes, risk funds). Also includes building local and national capacities and supporting the establishment of efficient and sustainable national structures able to promote disaster risk reduction.
	43071		Food security policy and administrative management	Food security policy, programs, and activities; institution capacity strengthening; policies, programs for the reduction of food loss/waste; food security information systems, data collection, statistics, analysis, tools, methods; coordination and governance mechanisms; other unspecified food security activities.
	43072		Household food security programs	Short- or longer-term household food security programs and activities that improve the access of households to nutritionally adequate diets (excluding any cash transfers within broader social welfare programs that do not have a specific food security, food acquisition, or nutrition focus, which should be reported under code 16010).
	43082		Research/scientific institutions	When sector cannot be identified.

Table A2 | Breakdown of Geographical Regions

REGIONS	OECD REGIONS AND COUNTRIES INCLUDED
Sub-Saharan Africa	Africa, regional; South of Sahara, regional; Angola; Benin; Botswana; Burkina Faso; Burundi; Cabo Verde; Cameroon; Central African Republic; Chad; Comoros; Congo; Côte d'Ivoire; Democratic Republic of the Congo; Djibouti; Equatorial Guinea; Eritrea; Eswatini; Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Mauritius; Mozambique; Namibia; Niger; Nigeria; Rwanda; Saint Helena; São Tomé and Príncipe; Senegal; Sierra Leone; Somalia; South Africa; South Sudan; Sudan; Tanzania; Togo; Uganda; Zambia; Zimbabwe
Latin America and Caribbean	America, regional; Caribbean, regional; Caribbean & Central America, regional; South America, regional; Antigua and Barbuda; Argentina; Belize; Bolivia; Brazil; Colombia; Costa Rica; Cuba; Dominica; Dominican Republic; Ecuador; El Salvador; Grenada; Guatemala; Guyana; Haiti; Honduras; Jamaica; Mexico; Montserrat; Nicaragua; Panama; Paraguay; Peru; Saint Lucia; Saint Vincent and the Grenadines; Suriname; Venezuela
South and Central Asia	Asia, regional; Central Asia, regional; South & Central Asia, regional; South Asia, regional; Afghanistan; Armenia; Azerbaijan; Bangladesh; Bhutan; Georgia; India; Kazakhstan; Kyrgyzstan; Maldives; Myanmar; Nepal; Pakistan; Sri Lanka; Tajikistan; Turkmenistan; Uzbekistan
East Asia and the Pacific	Far East Asia, regional; Oceania, regional; Cambodia; China (People's Republic of); Cook Islands; Democratic People's Republic of Korea; Fiji; Indonesia; Kiribati; Lao People's Democratic Republic; Malaysia; Marshall Islands; Micronesia; Mongolia; Nauru; Niue; Palau; Papua New Guinea; Philippines; Samoa; Solomon Islands; Thailand; Timor-Leste; Tokelau; Tonga; Tuvalu; Vanuatu; Vietnam; Wallis and Futuna
Europe	Europe, regional; Albania; Belarus; Bosnia and Herzegovina; Kosovo; Moldova; Montenegro; North Macedonia; Serbia; states of the former Yugoslavia, unspecified; Turkey; Ukraine
Middle East and North Africa	Middle East, regional; North of Sahara, regional; Algeria; Egypt; Iran; Iraq; Jordan; Lebanon; Morocco; Syrian Arab Republic; Tunisia; West Bank and Gaza Strip; Yemen

APPENDIX B: INNOVATIVE IDEAS TO USE PUBLIC CAPITAL TO MOBILIZE PRIVATE CAPITAL

The following is a list of innovative ways to use public capital to mobilize private capital for NbSA as suggested by those interviewed for this paper and through our literature review.

Results-based finance (RBF): Mechanisms by which funds are disbursed when specific results are met after independent verification. Results-based climate finance would thus refer to RBF for specific climate change mitigation or adaptation objectives. A 2017 report by the World Bank indicated that results-based payments are well suited for mitigation projects because greenhouse gas (GHG) emissions are well-defined and measurable (WBG and Frankfurt School of Finance and Management 2017). The same report also noted the potential for results-based payment projects for adaptation. Some examples of RBF are listed below.

- **Payments for ecosystem services:** Direct or indirect transactions between the providers and beneficiaries of ecosystem services. In Section 4, this concept is represented by Example 2 for Peru (GEF 2014).
- **“Feebate” concept for forestry:** Fees for firms with emissions rates above a baseline level and subsidies for those with emissions rates below the baseline level. A 2019 paper by the International Monetary Fund (IMF) assessed feebate (tax subsidy) schemes as a potential fiscal instrument to promote GHG mitigation through forest carbon storage (IMF 2019).
- **Monetizing water savings:** Monetizes the efficient use of water in a “pay for performance” scheme, similar to how an energy service company monetizes the efficient use of energy (Global Innovation Lab for Climate Finance 2020).

Green bonds and other types of debt:

- **Green bonds:** Bonds issued to raise finance for environment- and climate-related projects, which can be printed by various issuer types, including governments, financial institutions, and nonfinancial corporates. In 2019, the Dutch government issued almost \$7 billion worth of bonds for low-carbon development and sustainable water management, with plans to specifically incorporate NbS (Almeida 2020; Anderson et al. 2019).

- **Climate impact bond:** Merges the idea of RBF with bonds, where an investor provides upfront capital to a service provider to deliver the targeted climate resilience outcome. Upon achievement of results, the outcome funder (typically a public sector agency or government) repays the investor at a premium (Puri and Khan 2019).
- **Debt-for-nature swaps:** A portion of a (developing) country’s foreign debt is forgiven in exchange for investments in environmental protection and/or conservation. See Example 3 (Seychelles).
- **Carbon offsets and taxes:** In some countries and regions, revenues from carbon pricing/taxes are deposited into a fund (or otherwise earmarked) to further reduce carbon emissions and GHGs. For instance, California’s Cap-and-Trade Program deposits its revenues into the state’s Greenhouse Gas Reduction Fund (California ARB n.d.). However, research by the IMF indicates that only 15 percent of the world’s carbon tax revenues have been used for environmental purposes. It is possible that these funds could begin to include adaptation (and NbSA) among their objectives. Carbon offsets could provide some of the revenue streams necessary to finance NbSA projects, though this would require scaling and strengthening of the global carbon markets.

Others:

- **Parametric insurance for natural capital:** A service provided by nature or an ecosystem is commodified, assigned a value, and insured. See Example 4 on coral reef insurance in Mexico.
- **Restoration Insurance Service Company:** Combines both the risk reduction value of natural capital with revenue from the trading of carbon credits (Global Innovation Lab for Climate Finance 2019).

ABBREVIATIONS

BMU	Federal Ministry of Environment, Nature Conservation and Nuclear Safety of Germany	LAC	Latin America and the Caribbean
CBD	Convention on Biological Diversity	M&E	monitoring and evaluating
CFA	Climate Finance Advisors	MDB	multilateral development bank
CPI	Climate Policy Initiative	MRV	monitoring, reporting, and verification
CPIC	Coalition for Private Investment in Conservation	NAP	national adaptation plan
CRS	Creditor Reporting System	NbS	nature-based solutions
DAC	Development Assistance Committee	NbSA	nature-based solutions for adaptation
DANIDA	Danish International Development Agency	NCFA	Natural Capital Finance Alliance
DGIS	Directorate-General for International Cooperation	NDC	nationally determined contribution
DRR	disaster risk reduction	NORAD	Norwegian Agency for Development Cooperation
EbA	ecosystem-based adaptation	O&M	operations and maintenance
Eco-DRR	Ecosystem-based disaster risk reduction	ODA	official development assistance
ENCORE	Exploring Natural Capital Opportunities, Risks and Exposure	OECD	Organisation for Economic Co-operation and Development
GCF	Green Climate Fund	RBF	results-based finance
GEF	Global Environment Facility	SAVi	Sustainable Asset Valuation
GHG	greenhouse gas	SeyCCAT	Seychelles Conservation and Climate Adaptation Trust
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit	TNC	The Nature Conservancy
IDB	Inter-American Development Bank	UNDP	United Nations Development Programme
IFAD	International Fund for Agricultural Development	UNEP	United Nations Environment Programme
IISD	International Institute for Sustainable Development	UNFCCC	United Nations Framework Convention on Climate Change
IMF	International Monetary Fund	WRI	World Resources Institute
IUCN	International Union for Conservation of Nature		

GLOSSARY

Biodiversity: 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 (CBD n.d.).

Donor: For the purposes of this paper, *donor* refers to organizations and institutions that primarily provide international assistance and support. In most cases, this includes national governments and multilateral development agencies, but in some cases, it may also include international/national NGOs or philanthropic foundations.

Ecosystem: The dynamic complex of plant, animal, and microorganism communities and their nonliving environment interacting as a functional unit (CBD n.d.).

Ecosystem-based adaptation (EbA): The use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to the adverse effects of climate change. EbA aims to maintain and increase the resilience and reduce the vulnerability of ecosystems and people in the face of the adverse effects of climate change (SCBD 2009).

Ecosystem-based disaster risk reduction (Eco-DRR): “The sustainable management, conservation and restoration of ecosystems to reduce disaster risk, with the aim to achieve sustainable and resilient development” (Estrella and Saalismaa 2013).

Ecosystem services: The benefits people obtain from ecosystems, which the Millennium Ecosystem Assessment has classified as including provisioning services, such as the supply of food, fiber, timber, and water; regulating services, such as carbon sequestration, climate regulation, water regulation and filtration, and pest control; cultural services, such as recreational experiences, educational, and spiritual enrichment; and supporting services, such as seed dispersal and soil formation (Millennium Ecosystem Assessment 2005).

Gray infrastructure: Involves human-built and human-engineered assets that provide one or multiple services required by society, such as dams, levees, reservoirs, treatment systems, and pipes (Browder et al. 2019).

Natural capital: Natural assets such as forests, water, fish stocks, minerals, biodiversity, and land. It is from this natural capital that humans derive a wide range of services, often called ecosystem services, which make human life possible (World Forum on Natural Capital n.d.).

Natural infrastructure: Refers to land networks or ecosystems that provide services inherent to those geographical areas while also perpetuating active conservation efforts and the enhancement of those environments (Bassi et al. 2019).

Recipient: An organization or country that primarily receives funding and implements projects domestically. In most cases, it refers to developing countries that receive funding, but in some cases, it may also include organizations or institutions that receive funding and implement/manage projects.

ENDNOTES

1. This assessment of official development assistance (ODA) and climate finance funding flowing for nature-based solutions for adaptation (NbSA) tracks funds committed in 2018. It does not assess domestic public financing or private investment as these data are difficult to obtain and, where available, are widely inconsistent. It may not capture all ODA that supports adaptation investments or investments that have adaptation cobenefits but are tagged as “mitigation” investments. Donors and funding channels listed are not exhaustive but represent the more significant contributors as identified for the relevant year.
2. This assessment focuses specifically on the use of NbSA outcomes, including ecosystem-based adaptation (EbA) along with EbA disaster risk reduction (DRR). Together, these cover the use of biodiversity and ecosystem services as part of an overall strategy to help people adapt to climate change as well as the sustainable management, conservation, and restoration of ecosystems to reduce disaster risk. Collectively, this paper labels these activities as *NbSA*.
3. NbSA was estimated to account for 5.8–13.5 percent of total public climate finance flows to developing countries in 2018 (which totaled \$64.3 billion) (OECD 2020a).
4. Includes both adaptation-specific flows and flows that have dual adaptation and mitigation benefits (Buchner et al. 2019).
5. Reliable estimates for total financing needs for NbSA (specifically) are not available.
6. Such as environmental policy, laws, regulations, and economic instruments; site preservation; and environmental research.
7. Forty-two percent refer to ecosystem-based adaptation actions, 20 percent to traditional conservation.
8. Since 2012, CPI has tracked overall climate finance flows, including those for mitigation and adaptation. Although CPI tracks overall adaptation flows as well as flows for “agriculture, forestry, land-use and natural resource management,” neither provides a clear picture of funding flowing for NbSA. CPI data shows that approximately 3 percent of overall climate finance flows are in the agriculture, forestry, land-use, and natural resource management category, but this also includes mitigation-focused investments. In both CPI’s tracking and in this assessment, the lack of explicit definitions and tags in the ODA databases, inconsistencies in definitions, and reporting challenges may result in underestimated figures.
9. Referring to both adaptation-specific flows and flows that have dual adaptation and mitigation benefits in the CPI’s *Global Landscape of Climate Finance 2019* (Buchner et al. 2019).
10. The scale of GEF investment in NbSA, and NbS writ large, over the past 30 years is substantial, and there are also relevant funds coming through the Adaptation Fund and the Pilot Program for Climate Resilience. Some multilateral delivery channels may not be reporting consistently within the OECD databases (and/or may not report to the OECD at all); thus, this data may not fully capture their contributions to NbSA.
11. For details and descriptions of the sectors, please see Table A.1 in Appendix A.
12. Because this paper focuses on public international donor sources of funding for NbSA and the channels for those funds, the barriers covered in this section relate most closely to the building blocks on “knowledge,” “awareness,” and “financing.” Although other building blocks are also important, the recommended actions have focused on “policy/regulatory” and “technical capacity” because donors fund actions related to those building blocks.
13. Such as guarantees to attract more risk-averse investment capital.
14. For example, the International Union for Conservation of Nature has been leading the development of a global standard for NbS writ large, and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) supported the development of a framework for defining criteria and standards for NbSA in 2018 (see FEBA 2017).
15. This paper primarily focuses on making ODA and public sources of capital for NbSA more effective and efficient. Innovative approaches for mobilizing private capital are illustrated in Appendix B.

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ABOUT WRI

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