Inter-American Development Bank

Nature-Based Solutions: Increasing Private Sector Uptake for Climate-Resilience Infrastructure in Latin America and the Caribbean

Climate Change Division

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EMERGING FINDINGS: A DISCUSSION PAPER

Nature-based Solutions (NbS) can be used as a cost effective way to build infrastructure resilience in response to a changing climate, while also delivering a range of other societal benefits. Yet, many business aren't aware of these benefits, and implementation of NbS by the private sector (including businesses that plan, design, construct and fund infrastructure) has been limited in Latin American and the Caribbean (LAC). As a region where infrastructure investments are required due to economic and population growth, and where climate impacts are acute, LAC is an ideal setting for multifunctional solutions like NbS to help build climate-resilient infrastructure.

Through a collaborative project, the Inter-American Development Bank (IDB), UN Environment Programme (UNEP), Acclimatise, and the UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) are exploring the barriers to, and opportunities for, increasing private-sector uptake of NbS in the infrastructure sector in LAC.

This document outlines emerging findings from the work and provides initial recommendations for infrastructure project developers, financial institutions, and policy makers, to create a more enabling environment for NbS.

IDB Inter-American Development Bank

UN environment programme

ACCLIMATISE
building climate resilience

UN environment programme
WCMC 40 years

Content

ACRONYMS

IDB	Inter-American Development Bank
LAC	Latin America and the Caribbean
NbS	Nature-based Solutions
PES	Payment for Ecosystem Services
UNEP	UN Environment Programme
UNEP-WCMC	UN Environment Programme World Conservation Monitoring Centre

Introduction

As greenhouse gas emissions continue to rise, climate change impacts are becoming more acute and frequent, driving the need for climate resilience in infrastructure investments across Latin America and the Caribbean (LAC). Climate-related hazards, exacerbated by El Niño–Southern Oscillation events, have led to disasters causing billions of dollars of costs and production losses,[i] which will only increase over time. Climate change can impact both infrastructure service delivery (e.g. water supply) and infrastructure assets (e.g. roads and buildings on coasts).

At the same time, nature and ecosystem services are under severe threat. Globally, over 85% of wetlands have been converted, 75% of land surface has been altered, 66% of oceans are experiencing cumulative threats, and millions of hectares of primary forest have been lost.[ii] Solutions that can build climate resilience, deliver enhanced infrastructure services, and maintain the valuable ecosystems that humans depend on, are urgently required to address a range of issues in tandem.

Across LAC, NbS could play a significant role in ensuring climate resilience, and would bring substantial additional co-benefits including: improved management of natural capital[1]; maintaining or enhancing greenhouse gas sinks; and a range of other regulating, supporting, provisioning, and cultural ecosystem services.

There is general recognition and growing awareness that NbS can play an important role in increasing climate change resilience and ensuring the delivery of sustainable infrastructure services. However, NbS have not been widely deployed to enhance climate resilience in infrastructure projects in LAC. In addition, the financial viability of NbS has not been sufficiently proven at scale to fully engage private sector investment and/or utilization of NbS.

To increase use of NbS and ensure that they are systematically incorporated into decision making, several barriers will need to be addressed. For example, the management of nature and ecosystem services typically resides in the Ministry of Environment, while decisions concerning infrastructure tend to be made in Ministries of Planning and Finance. This can mean that options such as NbS aren't always considered in early stage planning and procurement processes for infrastructure. Private sector approaches to NbS often fall within the remit of Corporate Social Responsibility or Sustainability teams rather than in executive, engineering, and operational teams. NbS are frequently not considered or incorporated into policy, legislative, regulatory, or organizational arrangements. Project developers lack skillsets and methodologies to incorporate NbS into project development, and face difficulties defining the business case as a means to secure NbS financing.

In addition to outlining some of these technical, institutional, financial and policy barriers, this Emerging Findings discussion paper identifies initial opportunities and actions for change to help advance the NbS agenda in LAC.

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[1] *Natural capital: 'refers to the living and nonliving components of ecosystems—other than people and what they manufacture— that contribute to the generation of goods and services of value for people'.*[iv]

What are Nature-based Solutions?

The term Nature-based Solutions (NbS) covers a range of ecosystem-related approaches to address societal challenges.[iii] NbS can encompass natural infrastructure (NI) and green infrastructure (GI), as well as approaches that combine green and gray[2] elements (referred to as 'integrated' approaches).[3] **In the context of this report, NbS refer to activities associated with the protection, management, enhancement, and restoration of natural capital[4] to develop climate-resilient infrastructure.** Examples of how NbS can help increase the climate resilience of infrastructure include watershed restoration to regulate water supply and decrease sedimentation to maintain the function of a hydroelectric dam, and management/rehabilitation of coral reefs to dissipate wave energy and reduce flood risk. NbS may help to mitigate multiple hazards (e.g. flood risk, landslides, and water stress) while generating a series of co-benefits (e.g. biodiversity conservation, income-generating opportunities, and recreation), demonstrating greater versatility than gray infrastructure alone in the face of multiple challenges. Furthermore, NbS can support the delivery of infrastructure services with greater resource efficiency[5] than gray solutions, while sequestering carbon and increasing resilience to the impacts of a changing climate. NbS can also provide direct economic value by reducing losses through enhanced resilience (e.g. reducing inland flood risk) and delivering benefits, some of which may generate revenue. The profile of NbS is growing as these benefits are increasingly being recognized, especially in the context of climate change. For example, NbS were featured as one of six priority Action Portfolios by the Secretary General of the United Nations at the 2019 UN Climate Action Summit.[iv]

Figure 1 shows how NbS and gray infrastructure can enhance the climate resilience of infrastructure and infrastructure services, and provides examples of where the two types of solutions could be integrated.

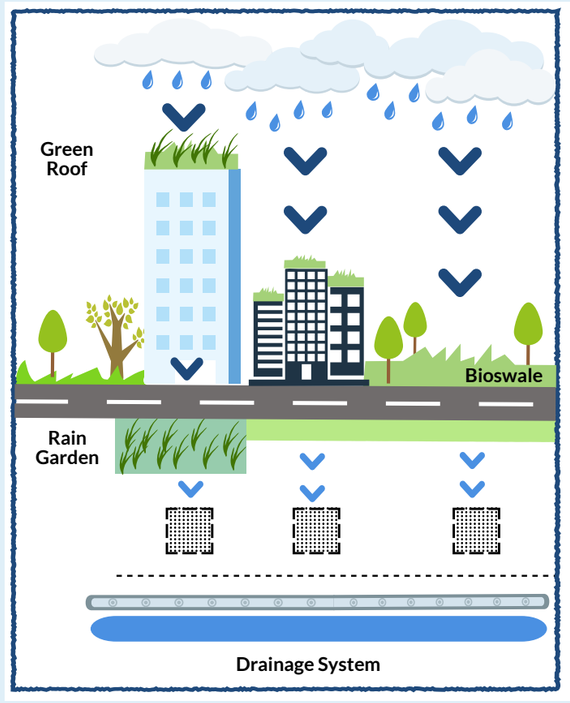
Figure 1: Nature-based and gray solutions for addressing climate risks

Climate Risk	Gray Solutions (Engineered)	Nature-based Solutions
Urban stormwater / flood management	• Retrofitted / enhanced urban storm-water drainage systems • Engineered flood protection	• Green roofs • Urban gardens and green spaces • Riparian and wetland vegetation restoration, creation, and management
Coastal flooding, storm surge, sea level rise, and erosion	• Seawalls, dykes, permanent artificial walls, and temporary storm barriers • Improved drainage systems	Conservation, management, restoration, and (in some cases) creation of: • Coral reefs (including using artificial substrate) • Oyster reef • Sea grass • Coastal wetlands, mangroves, and salt marshes • Sand dunes and beaches
Inland flooding	• Alluvial dykes and dams (creation, retrofitting, and maintenance) • Improved pumping, piping, and storage systems	• Upslope vegetation management • Forest restoration • Riparian and wetland restoration/creation and management, living weirs, and check-dams • Floodplain management
Landslides	• Retaining walls • Gabions	• Upslope vegetation management • Reforestation and afforestation (where appropriate)
Water scarcity	• Reservoirs / dams • Concrete catchments • Desalination plants (if coastal) • Aqueducts	• Watershed restoration, including reforestation (where appropriate) • Permeable 'green' areas for groundwater replenishment
Soil erosion and sedimentation	• Retaining walls • Terracing • Dredging programs	• Upslope vegetation restoration and management • Reforestation and afforestation (where appropriate) • Management of littoral vegetation and wetlands

Integrated Example 1: Green roof, bio swale and rain gardens to regulate storm water runoff and reduce flows to drainage systems

Integrated Example 2: Restoring / conserving mangrove belts that support sea dykes as a first line of defense reducing flood risk and erosion

Integrated Example 3: Watershed restoration surrounding dams to regulate water supply and decrease sedimentation



[2] *Gray infrastructure: 'built structures and mechanical equipment, such as reservoirs, embankments, pipes, pumps, water treatment plants, and canals'.*[v]

[3] *Definition based on Cohen-Shacham, et al. 2016,*[iii] *and Browder, et al. 2019.*[v] *Note the term NbS encompasses a larger concept than what is presented here. See Cohen-Shachman, 2016* [vi] *for a broader definition and the origin of NbS.*

[4] *Natural capital: 'refers to the living and nonliving components of ecosystems—other than people and what they manufacture— that contribute to the generation of goods and services of value for people'.*[iv]

[5] *For example, green roofs have been shown to be effective at regulating temperature, thereby decreasing the need for energy production for heating and cooling. See: https://www.epa.gov/heat-islands/using-green-roofs-reduce-heat-islands.*

NbS can play an important role in building resilience to climate change in an infrastructure context. For example, managing and restoring vegetation can enable the root systems of trees and other vegetation to stabilize and regenerate soils and help to **reduce landslides, erosion and flood risk** to assets and transport links; coral reefs and mangroves serve as effective breakwaters against **coastal storm surge, reducing flood risk** for coastal assets; and forests and other upland vegetation can help **regulate water supply** required for hydroelectric energy generation during periods of **drought**. In addition to helping society to adapt to the hazards caused or exacerbated by climate change, ecosystems such as forests and oceans play an important role in natural carbon sequestration. They are also essential to achieving the Sustainable Development Goals (SDG)[6] and meeting the global commitments set out in the Paris Agreement[7] on climate change.

NbS could have an important role to play in meeting rising demand for infrastructure services driven by population increase, rapid urbanization, and by the adverse impacts of climate change.[vii] Investments in energy, transport, water supply, sanitation, irrigation, and flood protection are critically important for economic development. However, meeting infrastructure demands with high-carbon, inefficient, resource-intensive, climate vulnerable, and otherwise unsustainable infrastructure investments will undermine efforts to achieve the Sustainable Development Goals and exacerbate the challenges presented by climate change.

NbS can be applied in a variety of contexts (e.g. urban, rural) to meet infrastructure needs (see Figure 1), while generating a series of co-benefits, such as climate regulation, biodiversity conservation, enhanced food security, and improved livelihoods, that are essential to community well-being. NbS and their co-benefits contribute to meeting national and global commitments such as those under the United Nations Framework Convention on Climate Change (UNFCCC),[8] the Convention on Biological Diversity (CBD),[9] the Habitat III Commitments,[10] the Sendai Framework for Disaster Risk Reduction,[11] and the Addis Ababa Action Agenda.[12] They are also key to the Sustainable Infrastructure Agenda.[13]

Recognizing the range of benefits that NbS offer, **this project focuses on how NbS can help to make infrastructure more climate resilient in LAC** (see Box 1).

[6] See: https://sustainabledevelopment.un.org/?menu=1300

[7] See: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[8] See: https://unfccc.int/

[9] See: https://www.cbd.int/

[10] See: http://habitat3.org/the-new-urban-agenda/

[11] See: https://www.unisdr.org/we/coordinate/sendai-framework

[12] See: https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=2051&menu=35

[13] See: https://publications.iadb.org/en/attributes-and-framework-sustainable-infrastructure

Box 1: Project Context

NbS are very relevant to LAC where investment is needed in both infrastructure development and climate adaptation.[14] Due to public sector financial constraints, this need is increasingly being met by private sector investment and development. Investment in NbS can be an attractive value proposition; according to the Global Commission on Adaptation the overall rate of return on investments in improving resilience (which can include NbS) are very high.[15] [viii]

Despite the range of benefits that NbS can offer, the research conducted for this project illustrates that private sector use of NbS to increase the climate resilience of infrastructure in LAC is limited. This assessment found that where private sector NbS initiatives do exist, they commonly formed part of Corporate Social Responsibility and sustainability initiatives, often with support from conservation organizations. It was less common for NbS to be implemented in response to a business-driven rationale. As the private sector plays a significant role in the financing, design, construction, and operation of infrastructure in LAC, this project examines barriers, opportunities, and actions for project developers, financial institutions, and policy makers, to increase adoption of NbS by the private sector.

[14] It is estimated that investments of 4.5% of GDP are required per year (2015-2030) to bridge the infrastructure gap, that is, the difference between investment needs and expenditures, in Latin America and Caribbean (LAC).[ix]

[15] For example, cost-benefit ratios for mangrove protection are nearly 6:1.[x]

Emerging Findings:

Barriers, Actions, and Recommendations

This section synthesizes the research results from this project to date into four emerging findings on factors that limit private sector uptake of NbS in LAC. Each finding includes:

- Barriers to NbS uptake (based on interviews, case studies, a survey, and other research);
- Opportunities and potential actions to resolve these barriers; and
- Recommendations to move forward directed at policy makers, project developers, and financial institutions.

See Page 19 for more information on the project and the upcoming Market Assessment report.

Finding 1: NbS need to be better mainstreamed into policy, legislation, and regulations

As gray infrastructure is the traditional standard for infrastructure development, NbS are typically not represented in most policy frameworks. Furthermore, the ministries and departments associated with management and governance of natural capital (e.g. environment) are commonly separated from those responsible for major economic functions and sectors (e.g. planning, transportation, energy, and agriculture). Despite recognition of NbS in international commitments[16] and environmental sector policies, they are rarely explicitly represented in policies of direct relevance to infrastructure planning, financing, and implementation in LAC, such as National and Sectoral Development Plans. Awareness of NbS is growing as their profile increases, but some government departments may lack knowledge of NbS, their ability to provide multiple functions, the business benefits they can bring, and their potential role in high-quality infrastructure development.

To encourage uptake by developers at project level, the potential of NbS to support sustainable infrastructure needs to be integrated into government policy and laws that govern decisions on project planning, development, and implementation (e.g. procurement, design codes, impact assessments, and operational performance). For example, project developers in the European Union are legally required as part of environmental assessments[17] to consider 'reasonable alternatives'.[18] A legislative requirement for project developers to acknowledge alternatives, both at the planning and design stage, can create an entry point for considering NbS.[xi]

Existing commitments could be built on to mainstream NbS into policies and underscore the important role that NbS can play in supporting climate resilience. In parallel, greater coordination between policy makers from different departments (e.g. environment, finance, infrastructure, and planning) can help to ensure that the potential of NbS is realized and goals are aligned.

Payment for Ecosystem Services (PES) programs have proved important for supporting NbS in a number of countries in LAC, particularly for developing water funds. For example, Costa Rica has a well-developed PES framework, while Colombia has targets to direct at least 1% of annual revenues towards PES schemes in water source areas.[xii] Reviewing lessons learned from PES schemes in LAC may help identify appropriate policies or laws that could support NbS uptake. Lessons can also be learned from experiences of mainstreaming green infrastructure in policy outside the region.

Recommendations

Raise awareness of NbS, and enhance capacity to integrate them into decision making, within ministries responsible for planning, financing, and implementing infrastructure projects. Conserving and managing natural capital is integral to sustainable economic development. Both inter-governmental and cross-ministerial dialogues[19] can help share experiences, build confidence and raise awareness to help mainstream NbS across policy frameworks. This can break down barriers between government ministries that have key roles in implementing NbS, such as Ministries of Planning, Finance, Environment, and Infrastructure. Lessons from Costa Rica, where natural capital is embedded within national accounting,[20] could offer useful insights for other LAC countries where natural capital is less integrated into development planning. Initiatives that can support government engagement with natural capital accounting include IDB's Natural Capital Lab,[21] and the United Nations' Natural Capital Accounting and Valuing Ecosystem Services Project.[22]

Integrate NbS into Infrastructure Planning and Procurement Processes. It is important to integrate NbS into the early stages of the decision-making process for infrastructure projects. The entity procuring infrastructure, whether government, private corporation, or public private partnership, will exert significant influence over the project terms and specifications. Including reference to, or requirements for, NbS in procurement documents (e.g. invitations to tender and contracts) would prompt downstream actors (e.g. project developers, funders, and insurers) to secure the necessary expertise to win contracts and deliver policy-compliant projects. NbS may not be appropriate or viable in every context. However, making evaluation of NbS a routine and mandatory requirement of project development (supported by evidence of appraised options) will promote NbS uptake by demonstrating its viability in relation to other options.

Technical assistance that supports governments and their procurement teams on how to draft clauses relating to NbS, how to evaluate tender documents, and how to monitor contract performance, could help increase capacity and uptake. The form and content of a Technical Guidance document for finance and other ministries on integrating NbS into policy and procurement processes will be discussed during upcoming consultations (see Page 19 for more information on the project).

[16] *For example, Argentina, Colombia, Costa Rica, Jamaica and Mexico explicitly include provisions linked to NbS or Ecosystem-based Adaptation in the adaptation section of their Nationally Determined Contributions (NDCs) under the Paris Agreement, while Paraguay and Peru both indirectly reference it. See: https://www.nbspolicyplatform.org/*

[17] *European Environmental Impact Assessment Directive (1985), the Strategic Environmental Assessment Directive (2001) and the Protocol on Strategic Environmental Assessments (2008).*

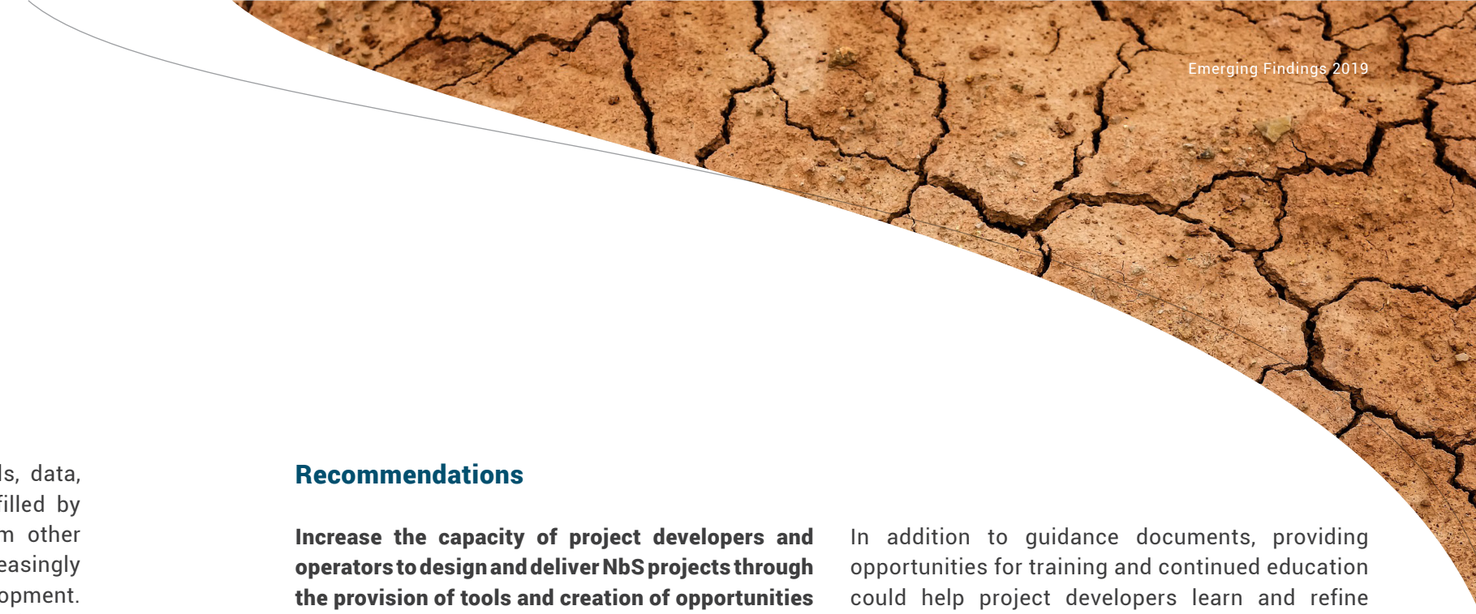
[18] *Reasonable Alternatives: "A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment". See: https://www.era-comm.eu/EU_Legislation_on_Environmental_Assessments/part_2/part_2_7.html*

[19] *For example, the 2019 United Nations Pre-Conference of the Parties in Costa Rica hosted a session for LAC Ministers of Finance on the Value of Natural Capital and NbS in national planning activities, underscoring the importance of awareness raising and capacity building.*

[20] *See: https://www.wavespartnership.org/sites/waves/files/kc/Costa%20Rica%20offer%20doc_FINAL.pdf*

[21] *See: https://www.iadb.org/en/environment/natural-capital-lab*

[22] *See: https://seea.un.org/home/Natural-Capital-Accounting-Project*



Finding 2: Project developers in LAC require additional skills, methodologies, tools, and capacity to incorporate NbS into infrastructure projects

Integrating NbS into project development and implementation requires a specialized skillset that typically goes beyond that of project developers trained to deliver gray infrastructure. Different skillsets will be required at different stages of infrastructure project development (e.g. planning, design, financing, operations, and maintenance), and NbS must be considered and integrated from the pre-planning stages in order to be successful.

As the performance of NbS is highly site-specific, variable, and sometimes complex, project developers will require access to data, information, and methodologies to conduct technical assessments (e.g. performance analysis, risk assessment, impact analysis, and financial analysis) for the project lifecycle. A lack of appropriate data, methodologies, and tools can reduce the feasibility and attractiveness of NbS, especially where they are readily available for gray infrastructure.

Project developers may also need enhanced capabilities in managing stakeholder engagement, as the range of stakeholders associated with NbS projects can be wider and more complex than for gray infrastructure. Furthermore, engaging with government actors to secure permits and navigating governance arrangements that may be unique to NbS projects can also prove more challenging than for traditional gray infrastructure.

Gaps in LAC-specific methodologies, tools, data, and experience can to some degree be filled by applying guidance and case studies from other parts of the world where NbS are increasingly mainstreamed into infrastructure development. For example, initiatives such as Deltares' Building with Nature[23] and the U.S. Army Corps of Engineers' Engineering with Nature[24] provide access to guidance documents, case studies, methodologies, and tools for the various phases of project development. Further, tools like InVEST,[25] ENCORE,[26] and WAVES[27] can be used to calculate the benefits from ecosystem services and identify risks (see Box 2) associated with the use of natural capital.

Capacity building, information sharing, and continued education for project developers could be achieved through partnerships between businesses and conservation organizations, and through professional engineering associations and academic institutions.

[23] *See: https://publicwiki.deltares.nl/display/BTG/Steps+and+phases*

[24] *See: https://ewn.el.erdc.dren.mil/about.html*

[25] *Stanford's InVEST is a tool that provides models for mapping and valuing ecosystem services provide by land and seascapes. See: https://naturalcapitalproject.stanford.edu/invest/*

[26] *ENCORE is a tool that allows users to explore natural capital risks, opportunities and exposure. See: https://encore.naturalcapital.finance/en/about*

[27] *WAVES is a World Bank-led global partnership helping to mainstream ecosystem valuation in development planning and national economic accounts through the development of novel accounting and valuation methodologies. See: https://www.wavespartnership.org/*

Recommendations

Increase the capacity of project developers and operators to design and deliver NbS projects through the provision of tools and creation of opportunities to develop technical skillsets. Methodologies that support various aspects of project development (e.g. governance, securing financing) throughout the project lifecycle will be particularly useful. To help meet the need for practical support IDB hosted a workshop for LAC project developers to gather insights on the contents of a Technical Guidance document on NbS.[28]

In addition to guidance documents, providing opportunities for training and continued education could help project developers learn and refine skillsets. Importantly, integrating NbS into academic curricula will equip future project developers with relevant skills. For example, the Engineering Department of the Universidad Nacional Autónoma de México (UNAM) is integrating green infrastructure into curricula and post-doctoral research projects, providing graduates with skillsets relevant to NbS projects.

Box 2: IDB's Disaster and Climate Risk Assessment Methodology[xiii]

The IDB has developed a methodology to facilitate the identification and assessment of climate change effects, as well as resilience opportunities in all relevant projects during their upstream preparation and implementation phases. It builds upon the current disaster risk screening process and provides guidance for project teams, executing agencies, technical experts, and external consulting and design firms, on conducting disaster and climate change risk assessments in relevant operations, ensuring added value to projects. While this methodology was not designed explicitly for NbS, it is applicable through its focus on infrastructure disaster risk management and resilience building.

[28] *The Technical Guidance for Project Developers will be available through the IDB website in 2020.*

Finding 3: Defining the business case is an important first step to build support and secure finance for NbS projects in LAC

NbS projects will not be developed and financers will rarely lend or invest without a clear business case and proof of concept setting out the costs, benefits, and risk profiles. Private Project Infrastructure finance follows parametric analysis based on Discounted Cash Flow (DCF) models. Reflecting and monetizing the benefits and costs of NbS in DCF analysis is key to unlocking private sector investment. Project financers are, as yet, unlikely to have experience financing NbS projects and therefore would be unfamiliar with the approaches and the associated risks. Because of this uncertainty, NbS will often be perceived as riskier than traditional engineering solutions, regardless of their actual risk profile.

Both within and outside LAC, building the business case and defining the proof of concept for NbS can be challenging for those without previous experience. A number of factors can influence the actual and perceived barriers to demonstrating the business case, including uncertainty on how ecosystems perform under variable conditions, data gaps, lack of analytical methodologies and guidance, and capacity barriers (see Finding 2). It can be easier to attract conventional financing if the NbS value stems from direct returns and revenues (e.g. from water supply or tourism) but more difficult if value is derived from resilience building, avoided losses, and non-monetary benefits.

There is growing experience of NbS implementation, in LAC and beyond, that can contribute to building a sound business case. In some instances, considerable progress has been made in evaluating a full range of both costs and benefits. Where the results and details of the approaches used are available, they can inform similar analysis for other NbS projects.

Recommendations

Project developers and stakeholders (e.g. governments, private sector, Multilateral Development Banks (MDBs), academic institutions, and civil society) should prioritize developing the business case to drive demand for financial products that can support NbS. This could include creating and disseminating cost-benefit analyses and financial models that illustrate the business case for NbS investment over appropriate time and geographic scales (see Box 3). Although a wide range of detailed and successful NbS case studies are available, few clearly portray the business case in economic terms. The economic case is important in order to demonstrate to investors, businesses, and project developers the value proposition, including the value of co-benefits.

Guidance on realistic assumptions and methodologies for those developing a business case is essential to increase confidence, build capacity, and establish a place for NbS in the infrastructure 'solutions toolbox'. Access to relevant data (e.g. capital costs, operational and maintenance costs, maintenance requirements, cost-benefits analysis, potential financial structures, and revenue mechanisms) could enable decision makers within business to consider NbS alongside gray options.

Box 3: What is the business case for NbS?

Climate hazards pose risks both to the delivery of infrastructure services, and to the infrastructure assets themselves. NbS, such as restored wetlands or mangroves, can offer economically viable and effective infrastructure solutions and / or strengthen the resilience of gray solutions such as drainage systems or sea walls. The business case for NbS derives from a combination of:

- reductions in upfront capital investment;
- reduced operations and maintenance costs over the project lifecycle (e.g. constructed wetlands compared to conventional wastewater treatment facilities);
- development of new innovations that could help diversify and scale-up business lines;
- avoided losses due to resilience benefits; and
- a wide range of co-benefits, including biodiversity conservation, improved livelihoods, or revenues from tourism, many of which can be valued and monetized[29]

Finding 4: There is a need to improve the conditions and scalability of financial instruments suitable for NbS investment in LAC

There are limited entry points for project developers to secure NbS financing, as well as a lack of guidance on how to access innovative finance for NbS. As with other innovations, such as renewable energy and energy efficiency technologies, it can take decades for markets to mature, which presents a barrier for project developers to access financing. Due to a perceived lack of demand, few financial institutions in LAC have financed NbS directly, either as stand-alone solutions or as components of integrated infrastructure projects. Those that have, often support NbS investments through loans and grants to public entities, rather than the private sector.

The emerging and growing demand for products to support NbS projects is not yet seen as significant by project financers and insurers. As a result, there are perceived to be few incentives to develop innovative financing and insurance mechanisms. Project developers must therefore define the business case for NbS (see Finding 3) in order to stimulate greater demand. Commercial

[29] *Some ecosystem services have an explicit market price (e.g. freshwater or fish), whereas others are non-market but offer a tangible benefit (i.e. coastal protection) or intangible benefits (e.g. cultural appreciation). These can be monetized using different economic valuation methods including: Contingent Valuation Method, hedonic price method, travel cost method, damage costs avoided.*

banks, for example, need to see a market signal in order to develop new financial products that can accommodate the investment profiles of NbS (i.e. that are fit for purpose considering return on investment and risk profiles).[30] Insurers also need to see demand for NbS coverage, as well as better understand the risk profiles associated with NbS investment, and how they can capture value from insuring natural capital.

There is growing interest among financial institutions in LAC to mainstream environmental, social, and governance considerations into their credit and investment decision-making cycles. Many financial institutions have yet to establish targets for promoting green financing, or develop green investment and lending mechanisms, such as green bonds or green credit lines.[31] At present, most financial entities in the region do not promote green investments or disclose how they are taking measures to reduce environmental, social, and climate risks in their economic transactions. However, this is beginning to change.

Lessons for private sector financing could be learned from schemes that support government implementation of NbS, such as those under development by Corporación Andina de Fomento (CAF).[32] Encouragingly, insurance products related to NbS are starting to emerge. The US$ 3.8 million insurance policy for Mexico's MesoAmerican reef is a flagship example of insurers providing parametric coverage for natural assets.[xiv] Similarly, there are many potential insurance solutions that could be developed or adapted to cover marine ecosystems and coastal assets exposed to ocean risks.[xv] Banking regulatory authorities are beginning to introduce new norms and practices, and international voluntary frameworks (e.g. Principles for Responsible Investment, Principles for Responsible Banking, Green Bond Principles, and Principles for Sustainable Insurance) are increasingly being adopted by financial institutions. Such changes can rapidly shift the attention of financial institutions towards green investments and facilitate the emergence of instruments tailored to finance climate-resilient investments, including NbS (see Box 4).

At present the market for NbS in LAC is still in the very early stages of development. Therefore, financial instruments to de-risk projects (e.g. risk underwriting, provision of guarantees, and technical assistance) are very important for building investor confidence, particularly while local financial institutions build a track record and common understanding of NbS finance. Such instruments can be deployed with the support of Multilateral Development Banks, public financial institutions, and international lending facilities with a mandate to support green investments. Furthermore, financial support could be scaled up by incorporating NbS into the standards and credit rating schemes for sustainable infrastructure lending.

[30] *New financial products have started to emerge in the region, but they are mostly designed and promoted by Non-Governmental Organizations. Such is the case with the Cloud Forest Blue Energy Mechanism proposed by Conservation International and The Nature Conservancy, which aims to mobilize domestic commercial finance, bringing together environmental valuation methods and 'pay for success' financing approaches, to reforest and conserve cloud forests in LAC. For more information on this mechanism visit: https://www.climatefinancelab.org/project/cloud-forest-blue-energy-mechanism/*

[31] *Financial entities in LAC that have already established green finance targets and/or mechanisms to finance green investments consulted under this study include: Bancolombia and Bancoldex in Colombia and Bancomer and FIDA in Mexico.*

[32] *CAF is supporting the development of concept notes to potentially support government in the funding of three 'hydroparks' in Mexico City, building on the successful experience of La Quebradora, Mexico. The Parque hídrico La Quebradora in Mexico City is a publicly accessible water retention and treatment complex designed by an interdisciplinary team at the University of UNAM. Located at the hillside Sierra Santa Catalina in Iztapalapa (Mexico City's largest and poorest borough), this four-hectare facility serves an area of 28,000 inhabitants affected by flood risk and water shortages, which was in urgent need of recreational spaces for its community. Featuring buildings, plazas and recreation areas as well as water management infrastructure components, the complex was designed with support from the community as a place that would further promote cultural and social exchanges among its members, while also being able to catch rain and mitigate flooding during downpours.*

Recommendations

Multilateral Development Banks have an important role to play in growing the market for NbS by developing and deploying innovative instruments to finance and refinance NbS. This could be achieved through mechanisms such as:

- Partnering with local financial institutions interested in expanding their green portfolios to help them develop and publicize NbS-related pilots, case studies, and products;
- Supporting the development of result-based financing schemes (e.g. social and development impact bonds);[34]
- Promoting the expansion of the resilience bonds market;[35]
- Promoting the proliferation and expansion of aggregating credit facilities such as habitat banks and water funds;[36]
- Developing blended finance mechanisms; and
- Providing credit guarantees.

Box 4: Innovative Financing

Resilience Bonds

The ability of NbS to build resilience and offer co-benefits (e.g. carbon sequestration and biodiversity conservation) can make them eligible for cost-sharing, investment pooling, and innovative finance mechanisms such as resilience bonds. As a form of Catastrophe Bond, resilience bonds link insurance premiums to the resilience of projects and therefore provide a way to monetize avoided losses through a rebate structure. The resulting dividends can be used for other resilience activities, such as training infrastructure operators on NbS maintenance or other capacity building.

The European Bank for Reconstruction and Development recently issued the first ever climate resilience bond, which raised US$700 million.[33] These funds can be used towards developing climate-resilient infrastructure, and could therefore help support NbS projects.

Green Bonds

Green bonds can mobilize resources from domestic and international capital markets for climate change adaptation, renewables, and other environment-friendly projects. They operate in the same way as conventional bonds but the proceeds can only be invested in projects that generate environmental benefits, which could include NbS.

[33] *See: https://www.ebrd.com/news/2019/worlds-first-dedicated-climate-resilience-bond-for-us-700m-is-issued-by-ebrd-.html*

[34] *Result-based financing investments have been explored in LAC in sectors such as health care and solid waste management. They should be further refined to encourage NbS investments in areas where concrete examples with long-term sustainable outcomes do not yet exist.*

[35] *Resilience Bonds are a form of Catastrophe Bond that link insurance premiums to resilience projects in order to monetize avoided losses through a rebate structure that turns avoided losses in to a revenue stream. Find out more about their uses and structure at: https://journals.openedition.org/factsreports/4910*

[36] *Organizations such as The Nature Conservancy and the IDB Lab have been promoting the deployment of these financing mechanisms successfully within the region. Their model can be rolled out to other organizations looking to support restoration and conservation efforts in LAC. See: https://www.nature.org/media/freshwater/latin-america-water-funds.pdf*

Conclusions

NbS present the opportunity to tackle a range of 21st century challenges, including climate change, biodiversity loss, and unsustainable growth. NbS are also a key element of the Sustainable Infrastructure Agenda. They have the potential to deliver climate-resilient infrastructure in LAC in cost effective ways, while delivering a range of co-benefits that contribute to community well-being and help to meet international commitments.

Despite the potential for NbS to deliver multiple benefits, this study found that private sector uptake of NbS for climate resilient infrastructure in LAC has been limited to date, and their full potential is not being realized. Significant changes to policy frameworks, strengthening skills and capacity among project developers, and deploying innovative financial support at scale are necessary to address an over-reliance on gray infrastructure and ensure that NbS become part of the infrastructure solution in LAC.

Coordinated action by all those involved with infrastructure development, including policy makers, project developers and financial institutions (see Box 5), is needed to create the enabling conditions for private sector uptake of NbS. Such action will help capitalise on the current opportunity to scale up NbS use, and contribute to meeting the urgent need for sustainable and climate resilient infrastructure in LAC.

Box 5: Targeted actions to drive change and create an enabling environment for private sector uptake of NbS in LAC.

Policy Makers

- Integrate NbS into policy commitments for multiple linked objectives (e.g. national development planning, climate and disaster risk reduction commitments, infrastructure plans).
- Translate policy commitments into laws and regulations that govern the delivery of infrastructure by project developers on the ground.
- Seek opportunities to use existing coordination mechanisms between different ministries, departments and levels of government involved with infrastructure delivery (e.g. environment, finance, planning) to ensure that the potential of NbS is realized and goals are aligned.
- Integrate NbS into infrastructure planning and procurement processes so downstream actors obtain the necessary expertise to win contracts and deliver policy-compliant projects.

Project Developers, Academia, and Non-Governmental Organizations

- Develop new technical skillsets and capacities for delivering NbS projects where they differ from those required for gray infrastructure projects.
- Support education opportunities through integrating NbS into continuing professional development and academic curricula (e.g. engineering) to equip future project developers and engineers with skills relevant to NbS.
- Prioritize the development of the business case as a means to create demand for the development of commercial products supportive of NbS finance.

Financial Institutions (Multilateral Development Banks, public financial institutions, and international lending facilities)

- Deploy financial instruments to de-risk projects (e.g. risk underwriting, provision of guarantees, and technical assistance).
- Provide support to local financial institutions while they build a track record and common understanding of NbS finance.
  understanding of NbS finance.

References

[i] The World Bank and GFDRR. 2012. Disaster Risk Management in Latin America and the Caribbean Region: GFDRR Country Notes. Available at, http://documents.worldbank.org/curated/en/826811468010903390/Disaster-risk-management-in-Latin-America-and-the-Caribbean-Region-GFDRR-country-notes

[ii] IPBES. 2019. Global Assessment Report on Biodiversity and Ecosystem Services. Report of the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on the work of its seventh session. Available at, https://www.ipbes.net/event/ipbes-7-plenary

[iii] Cohen-Shacham, E., Walters, G., Janzen, C. and Maginnis, S. 2016. Nature-Based Solutions to Address Global Societal Challenges. Gland, Switzerland: International Union for Conservation of Nature (IUCN). Available at, https://portals.iucn.org/library/sites/library/files/documents/2016-036.pdf

[iv] United Nations. 2019. UN Climate Action Summit. Available at, https://www.un.org/en/climatechange/un-climate-summit-2019.shtml

[v] Browder, G., Ozment, S., Rehberger Bescos, I., Gartner, T., Lange, G.M. 2019. Integrating Green and Gray, Creating Next Generation Infrastructure. World Bank Group and World Resources Institute. Available at, https://www.wri.org/publication/integrating-green-gray.

[vi] Cohen-Shacham, E., Walters, G., Janzen, C. and Maginnis, S. 2016. Nature-Based Solutions to Address Global Societal Challenges. Gland, Switzerland: International Union for Conservation of Nature (IUCN). Available at, https://portals.iucn.org/library/sites/library/files/documents/2016-036.pdf

[vii] Bhattacharya, A., Meltzer, J., Oppenheim, J., Qureshi, Z., & Stern, N. 2016. Delivering on SUSTAINABLE INFRASTRUCTURE for Better Development and Better Climate. Global Economy and Development at Brookings, The New Climate Economy, and the Grantham Research Institute on Climate Change and Environment. Available at, https://www.brookings.edu/research/delivering-on-sustainable-infrastructure-for-better-development-and-better-climate/.

[viii] Global Commission on Adaptation. 2019. Adapt Now: A Global Call for Leadership on Climate Resilience. Global Center on Adaptation and The World Resources Institute. Available at, https://cdn.gca.org/assets/2019-09/GlobalCommission_Report_FINAL.pdf

[ix] Rozenberg, J., and Fay, M. (eds). 2019. Beyond the Gap: How Countries Can Afford the Infrastructure They Need while Protecting the Planet. Sustainable Infrastructure Series. World Bank. Available at, https://openknowledge.worldbank.org/handle/10986/31291

[x] Global Commission on Adaptation. 2019. Adapt Now: A Global Call for Leadership on Climate Resilience. Available at, https://cdn.gca.org/assets/2019-09/GlobalCommission_Report_FINAL.pdf

[xi] Davis, M., Abhold, K., Mederake, L., Knoblauch, D. 2018. Nature-based solutions in European and national policy frameworks. Deliverable 1.5, NATURVATION. Horizon 2020 Grant Agreement No 730243, European Commission. Available at, https://www.ecologic.eu/sites/files/publication/2018/naturvation_report_1_5_final_110618.pdf

[xii] World Business Council on Sustainable Development. 2017. Incentives for Natural Infrastructure. Review of Existing policies, incentives and barriers related to permitting finance and insurance of natural infrastructure. Available at, https://docs.wbcsd.org/2017/05/Incentives_for_Natural_Infrastructure.pdf

[xiii] Esquivel, M., Barandiarán, M. and Zuloaga, D., 2018. Executive Summary of the Disaster and Climate Risk Assessment Methodology for IDB Projects: A Technical Reference for IDB Project Teams. Inter-American Development Bank. Available at, https://publications.iadb.org/en/executive-summary-disaster-and-climate-risk-assessment-methodology-idb-projects-technical-reference

[xiv] Gonzalez, G. 2019. Parametric Insurance Policy to Cover Mexico Coral Reef. Business Insider. Available at, https://www.businessinsurance.com/article/20190607/NEWS06/912328933/Parametric-insurance-policy-to-cover-Mexico-coral-reef

[xv] Catlin, X.L. 2018. Ocean Risk and the Insurance Industry. Available at, https://www.oceanrisksummit.com/Content/press-releases/FALK-MAIN-REPORT-FINAL-LOW-RES.pdf

About This Project

There is growing awareness and understanding of the value of Nature-based Solutions (NbS). However, the adoption of NbS for sustainable infrastructure in LAC (particularly by the private sector) remains low. NbS have particular potential in LAC, where there is a wealth of natural capital that is under threat, increasing vulnerability to the impacts of climate change, and a significant demand for infrastructure due (in part) to rapid urbanization. This project examines the barriers and enablers to private sector uptake of NbS in LAC to increase the resilience of infrastructure to climate change.

This project includes a series of outputs aimed at understanding barriers and increasing capacities in support of private-sector uptake of NbS for climate-resilient infrastructure (see Box 6). This **Emerging Findings discussion paper** outlines the initial findings from the forthcoming Market Assessment, Deep Dives, and Technical Guidance documents.

Box 6: Forthcoming Project Deliverables

The Market Assessment (Report) is informed by desk-based research, survey results, case study analysis, and interviews with policy makers, financial institutions, Non-Governmental Organizations, project developers, academic institutions, and NbS experts across LAC. Findings draw on a series of case studies in, and experiences of, the following countries: Argentina; Colombia; Costa Rica; Jamaica; Mexico; Peru; and Paraguay. Cost benefit analyses will be completed for four of the case studies ('Deep Dives') to demonstrate the overall economic and financial viability of these projects.

A Technical Guidance Document for project developers will provide guidance on how project developers (e.g. engineers, architects, and contractors) can integrate NbS into the project development cycle (e.g. planning, design, finance, operations, and maintenance).

A Technical Guidance Document for policy makers will also be developed as part of the project.

The project deliverables described above will be available in 2020.

Audience

Policy Makers
in particular, national government ministries and regional and local governments concerned with the financing, planning, development, and operation of infrastructure.

Financial Institutions
including private and public investors and lenders, insurers, and Multilateral Development Banks (MDB).

Infrastructure Project Developers
including engineers, architects, designers, contractors, and infrastructure operators.

This project is a collaboration between The InterAmerican Development Bank (IDB), the United Nations Environment Programme (UNEP), Acclimatise, and the United Nations Environment Programme World Monitoring Conservation Center (UNEP-WCMC).

IDB
Inter-American Development Bank

UN environment programme