



# THE POTENTIAL FOR NATURE-BASED SOLUTIONS INITIATIVES TO INCORPORATE AND SCALE CLIMATE ADAPTATION

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## EXECUTIVE SUMMARY

### Highlights

- Nature-based solutions (NBS) for adaptation can play a key role in managing the climate change crisis while yielding critical environmental, economic, and social benefits.
- Multi-stakeholder, multi-year, and multi-country initiatives centered on NBS have great potential to expand adaptation goals into their activities and reach more stakeholders.
- This paper is based on a literature review, an online survey of 16 initiatives’ secretariat staffs, and follow-up interviews, with a deeper dive into three initiatives: the African Forest Landscape Restoration Initiative (AFR100), Cities4Forests, and Initiative 20x20.
- Most of the NBS initiatives surveyed in this research were not designed with adaptation goals in mind yet 94 percent of staff surveyed indicated a high or moderate demand for and interest in adaptation. This paper identifies opportunities for them to integrate adaptation.
- Opportunities for NBS initiatives to address adaptation include better leveraging NBS initiatives’ comparative strengths to expand their adaptation activities; further facilitating finance and investment; and harnessing current political momentum to build the case for the effectiveness of NBS as an approach to adaptation.

## CONTENTS

Executive Summary .....	1
1. Introduction .....	3
2. Landscape of Existing NBS Initiatives .....	6
3. Scope and Methodology .....	7
4. Discussion of Survey Findings.....	8
5. Key Opportunities for NBS Initiatives to Enhance and Scale Climate Adaptation .....	13
6. Recommendations .....	18
7. Conclusion .....	22
Appendix A .....	23
Appendix B .....	25
Appendix C .....	26
Endnotes .....	30
References .....	30
Acknowledgments.....	34

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- Recommendations for funders and managers of initiatives include investing in expanding existing NBS initiatives to integrate adaptation by building their mandates, functionality, inter-initiative collaboration, and staff capacity on this topic.

## What Are Nature-Based Solutions and Why Do They Matter?

The term *nature-based solutions* captures approaches to reverse natural resource degradation and biodiversity loss while promoting sustainable development. Across ecosystems, many NBS can also protect people and nature from climate impacts, including shorter-term hazards such as flooding and longer-term threats like desertification.

Reducing these risks is paramount, especially since they disproportionately affect vulnerable and marginalized groups (such as women, Indigenous peoples, the elderly, people living in poverty, and those with disabilities) who are directly dependent on natural resources for their livelihoods and/or are physically exposed to climate impacts. These groups stand to benefit the most from nature-based climate adaptation solutions, revealing an important opportunity to advance equity outcomes. Additionally, evidence continues to emerge showing that an NBS approach can be more effective and result in greater savings, social benefits, and avoided losses than business-as-usual interventions (World Bank 2020; Chausson et al. 2020).

The links between ecosystems and societal resilience are clear. When ecosystems degrade, communities become more vulnerable to climate risks and lose vital resources provided by nature. NBS approaches can protect livelihoods and human well-being, and help societies better adapt to the changing climate.

## Key Findings

**NBS initiatives have achieved important mitigation and sustainability outcomes; many could expand their impact by including adaptation.** Secretariat staff of surveyed initiatives stated a strong interest in better including climate adaptation. Deliberately integrating adaptation into existing NBS initiatives would contribute to ecosystem health, social well-being, and climate resilience simultaneously.

## This paper identifies key opportunities for NBS initiatives to contribute to adaptation outcomes:

- Better coordinating among NBS initiatives to incorporate and accelerate climate adaptation efforts, especially by leveraging one another's strengths: expertise in building strategic partnerships; providing specialized technical assistance and capacity building; promoting knowledge sharing; and actively engaging initiative stakeholders
- Sharing adaptation tools and processes from adaptation-focused organizations already integrating NBS
- Continuing to invest in NBS for adaptation pilots to open the door for larger initiatives while capitalizing on existing NBS initiatives' expertise in accessing and mobilizing finance to attract more funding for adaptation
- Maximizing the adaptation benefits that NBS can deliver to groups that disproportionately bear the brunt of both climate impacts and ecosystem degradation
- Harnessing current political momentum surrounding NBS for adaptation by improving the evidence and socioeconomic cases for them and by better communicating their benefits

## NBS initiatives face multiple barriers that limit their uptake of adaptation priorities.

Examples include insufficient funding to expand their activities to include adaptation and limited technical expertise on adaptation.

## Recommendations

Initiatives **should mainstream adaptation into their programs and activities, and better communicate the benefits of NBS for adaptation.** Initiative secretariats should engage with adaptation partners and practitioners to build technical knowledge of and capacity for NBS for adaptation. They should also engage with communications specialists to better translate and raise awareness of NBS for adaptation benefits for a range of audiences.

Funders **should consider investing in the expansion of existing initiatives as vehicles to incorporate and scale NBS for adaptation rather than creating new ones.** Funders should encourage initiatives that largely focus on NBS for mitigation and other environmental services to include more content on

adaptation, as this is a high-impact scaling opportunity to utilize initiatives' strengths, user audiences, and established support resources.

Funders and initiatives **should promote collaboration among initiatives to fill gaps, leverage initiatives' strengths, and develop global programs that can accelerate adaptation action.** A wide range of NBS initiatives has proliferated worldwide, which can fragment their impacts as an abundance of options may make the landscape more difficult for users to navigate. Initiatives have an opportunity to clarify their roles and better organize efforts, for example, by meaningfully including local governments and organizations; funders could help by encouraging multi-partner proposals.

Funders and initiatives **have an opportunity to enhance monitoring, evaluation, and learning (MEL) of NBS for adaptation to strengthen the case for further action.** Increased MEL and improvements to the evidence base on the benefits of NBS for adaptation will strengthen the economic, social, and environmental case for more and longer-term adaptation actions, capturing benefits for vulnerable groups. This integrated approach could result in more robust, equitable, and cost-effective solutions for cities, countries, and communities and help leverage more funding.

Funders and initiatives **can do more to facilitate access to finance.** NBS funders should provide flexible vehicles for financing the integration of adaptation into relevant pilots and programs, since expanding to include adaptation can enhance activities' resilience and effectiveness. The intersectionality of NBS initiatives means they are uniquely positioned to help their users access and develop innovative financial mechanisms, which could be used to unlock climate finance for adaptation—especially from the private sector.

## About This Paper

This paper seeks to understand the potential for existing NBS-centered initiatives to better incorporate climate adaptation, thereby contributing to broader adaptation efforts needed to combat the climate emergency. It explores the barriers these initiatives face to offering enhanced adaptation support, as well as existing and new opportunities for accelerating adaptation actions, while improving monitoring and evaluation and capturing lessons learned. Findings are based on an extensive

literature review, a survey of the secretariat staffs of 16 initiatives, and follow-up interviews. Examples from three countries and one city illustrate the specific supporting roles that NBS initiatives can play in accelerating NBS for adaptation.

The target audiences for this paper are managers and coordinators of NBS initiatives interested in increasing their climate adaptation impact; as well as funders of NBS initiatives, including bilateral and multilateral donors. The authors also hope that the findings and recommendations in this paper are useful to adaptation practitioners and other funders in the conservation, adaptation, and sustainable development spaces, as well as city and national governments exploring nature-based measures to increase their climate resilience to mounting climate change impacts.

## 1. INTRODUCTION

### 1.1 Definition and Evolution of Nature-Based Solutions for Adaptation

In the early 2000s, experts reconceptualized humans' relationship to nature-based solutions (NBS) to shift our understanding of our role from passive beneficiaries of nature conservation to proactive participants in nature protection, management, and restoration to address societal challenges (Cohen-Shacham et al. 2019). Today, NBS is used as an umbrella term that captures several approaches aiming to reverse natural resource degradation and biodiversity loss while promoting United Nations (UN) Sustainable Development Goals (SDGs) and at times building resilience to climate change impacts. These approaches include ecosystem-based adaptation, ecosystem-based mitigation, eco-disaster risk reduction, natural and/or green (and blue) infrastructure, natural climate solutions (focused on climate mitigation and carbon sequestration), engineering with nature, nature-based flood protection, and re-naturing (Cohen-Shacham et al. 2019).

A clear, universal definition of NBS does not exist, but definitions by the International Union for Conservation of Nature (IUCN), the European Commission, and the UN all highlight these solutions as powerful tools that in many cases can increase resilience and biodiversity while providing co-benefits for humans (Calliari et al. 2019; Kapos et al. 2019).

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Nature and the ecosystem services it provides underpin human society—and, if managed correctly, can be the first line of defense against extreme weather events and other climate risks, such as desertification and sea level rise (Kapos et al. 2019). Although using NBS approaches to adaptation are widely practiced by international development and climate adaptation practitioners, only recently have the broader climate mitigation and conservation communities begun to better recognize the potential of ecosystem services to help meet development and climate adaptation goals (Igoe 2019).

Even though cities and countries are showing interest in nature-based solutions for adaptation, they do not always have the technical expertise or financial and other resources to plan for and implement adaptation measures, and projects are often done on a pilot basis or in an ad hoc manner (Kapos et al. 2019). NBS initiatives could tap into the knowledge and tools employed by the adaptation community to mainstream NBS for adaptation across sectors to increase the use of biodiversity and ecosystem services to help people adapt to climate change effects. This paper aims to shed light on how multi-partner NBS initiatives can contribute to adaptation solutions, as some already have, and take advantage of existing opportunities to do more.

For the purposes of this working paper, NBS are defined as actions that protect, sustainably manage, and restore natural and modified ecosystems to address societal challenges effectively and adaptively, and that simultaneously provide human well-being and biodiversity benefits (IUCN n.d.). Adaptation is defined as the process of adjusting to actual or expected climate change and its effects, the process of moderating or avoiding harm, and the ability to exploit beneficial opportunities (IPCC 2014). Resilience is the ability of a system to cope with great change or disruption (adapted from IPCC 2018).

## 1.2 NBS for Adaptation Bring about Many Co-benefits

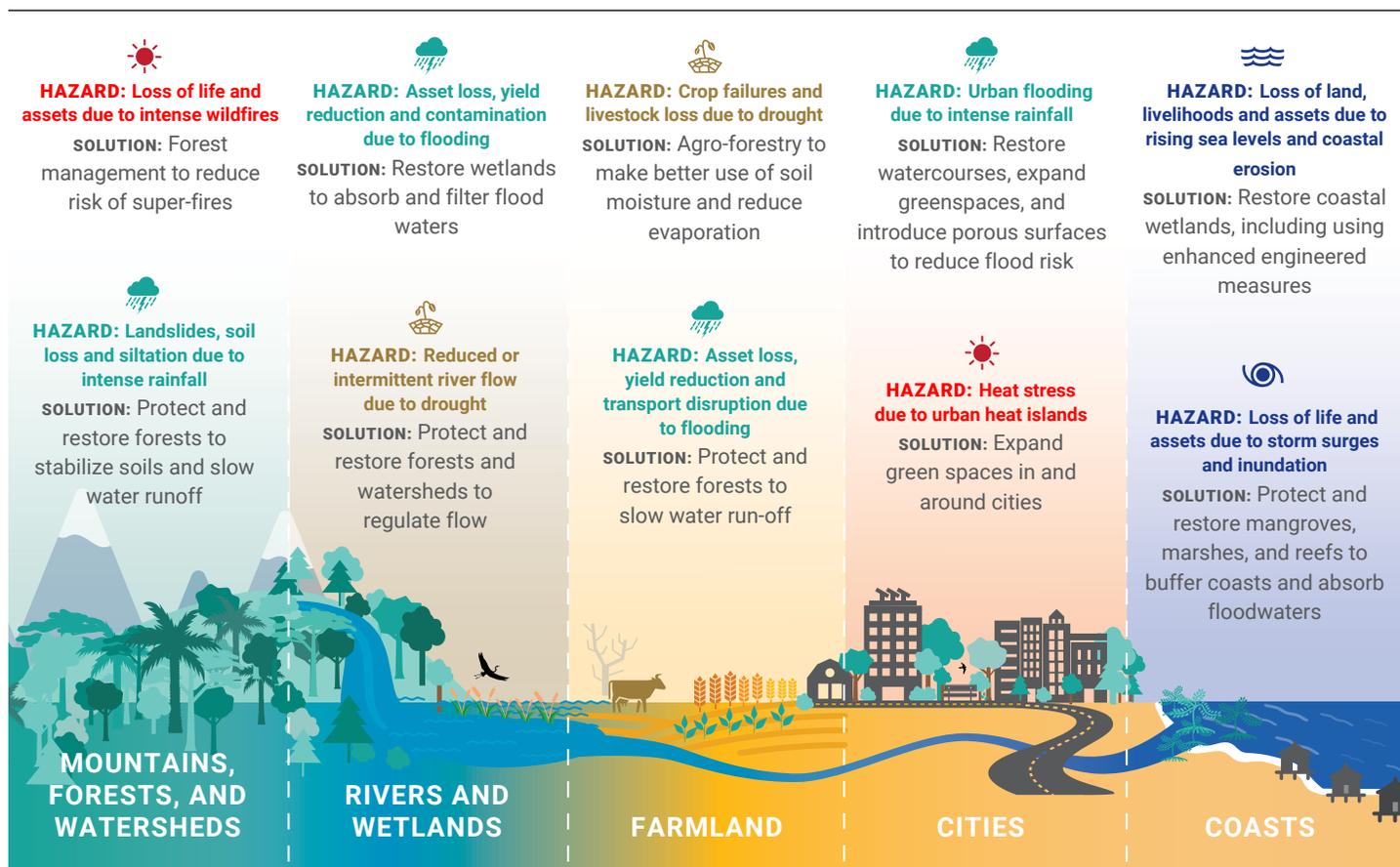
The most common types of climate-related hazards to which NBS are applied are coastal threats, flooding, landslides, drought, and rising temperatures (Kapos et al. 2019). Examples of co-benefits of adopting an integrated approach to climate, development, and nature include economic savings and efficiency gains from pooling resources, and unlocked social and environmental co-

benefits. Negative trade-offs can be lessened or avoided by considering how climate is expected to change in the coming years and decades, and building in respective decisions and measures to protect against these effects.

Although not all NBS activities contribute to adaptation,<sup>1</sup> many of them can support adaptation outcomes, in terms of protecting people and natural systems from both shorter-term hazards such as extreme heat days and longer-term threats like sea level rise and desertification (see Figure 1). This protection is especially relevant for equity reasons, given that marginalized groups, including many communities directly dependent on natural resources, are highly vulnerable to both climate change and environmental degradation. NBS can provide powerful societal benefits to vulnerable groups, such as access to water and firewood, in a way that is fair and equitable while promoting transparency and participation (Cohen-Shacham et al. 2019; IUCN 2020). Because NBS interventions often provide services for distant communities, cities, and governments, it is important to provide a clear participatory and representative process that involves local actors in decision-making, negotiations, and compensation mechanisms to prevent losses to the communities living in or near the intervention sites (Cohen-Shacham et al. 2019). Relatedly, green infrastructure can help reduce health inequalities by more fairly distributing health benefits to all of society, such as through nature-based water management techniques or green urban spaces (Pepinster 2021). Examples of overarching adaptation outcomes include enhanced food, water, and livelihood security; protection against flooding, drought, and disasters; and improved human health.

Research indicates that NBS can create or enhance natural buffers against extreme weather events and climate fluctuations that can damage physical assets and negatively impact livelihoods (Seddon et al. 2020). They can be as or more effective than alternative interventions to address climate impacts (World Bank 2020; Chausson et al. 2020; Kapos et al. 2019). For example, when compared with gray infrastructure, mangrove forests can provide a cost-effective green means of coastal protection from storms and hurricanes. One study found that, across 59 countries, mangroves can help save an estimated US\$65 billion annually in avoided losses in infrastructure and human systems, including health (Earth Security 2021).

Figure 1 | Across Ecosystems, Different Nature-Based Solutions Can Work Together to Build Climate Resilience



Source: Bapna et al. 2019.

Similarly, adequate watershed management and wetland rehabilitation can prevent loss of life and property by minimizing damages from extreme storms, soil erosion, and landslides. Agroforestry, natural reservoirs, and sustainable agricultural practices can protect against seasonal variability, pests and disease, and rising temperatures, thus decreasing food insecurity and crop losses.

### 1.3 NBS for Adaptation Are Cost-Effective

NBS have frequently been recognized as an equal or more cost-effective approach than traditional business-as-usual solutions (e.g., built “gray” infrastructure such as dikes, dams, reservoirs, pipes, and seawalls) (UNEP 2018). The Organisation for Economic Co-operation and Development found, for example, that NBS were two to five times more cost-effective than gray infrastructure across 52 coastal defense projects in the United States and were more effective in defending against waves up to half a meter high and at increased water depth (OECD

2020). Leveraging natural capital to protect against water-security threats—projected to rise in the coming decades—represents a potential \$3 trillion in avoided replacement costs by 2050 (Vörösmarty et al. 2021).

Likewise, a new study by the International Institute for Sustainable Development calculates that using nature in infrastructure projects can save governments and investors \$248 billion annually, and that NBS can be up to 50 percent cheaper than gray infrastructure while providing the same infrastructure services (IISD et al. 2021). Economic savings are especially important for the world’s most climate-vulnerable countries, which are typically the least able to afford the economic brunt of climate impacts (Bapna et al. 2019).

Given the potential to expand NBS initiatives’ outcomes by broadening their missions to include adaptation, this paper identifies opportunities and support needed for initiatives to integrate adaptation as well as opportunities to accelerate adaptation action.

## 2. LANDSCAPE OF EXISTING NBS INITIATIVES

This section gives an overview of the many types and flavors of global NBS-centered initiatives that were targeted for this research. Through the literature review, World Resources Institute (WRI) staff and partners identified over 40 relevant initiatives, and selected a subset for surveys and interviews.

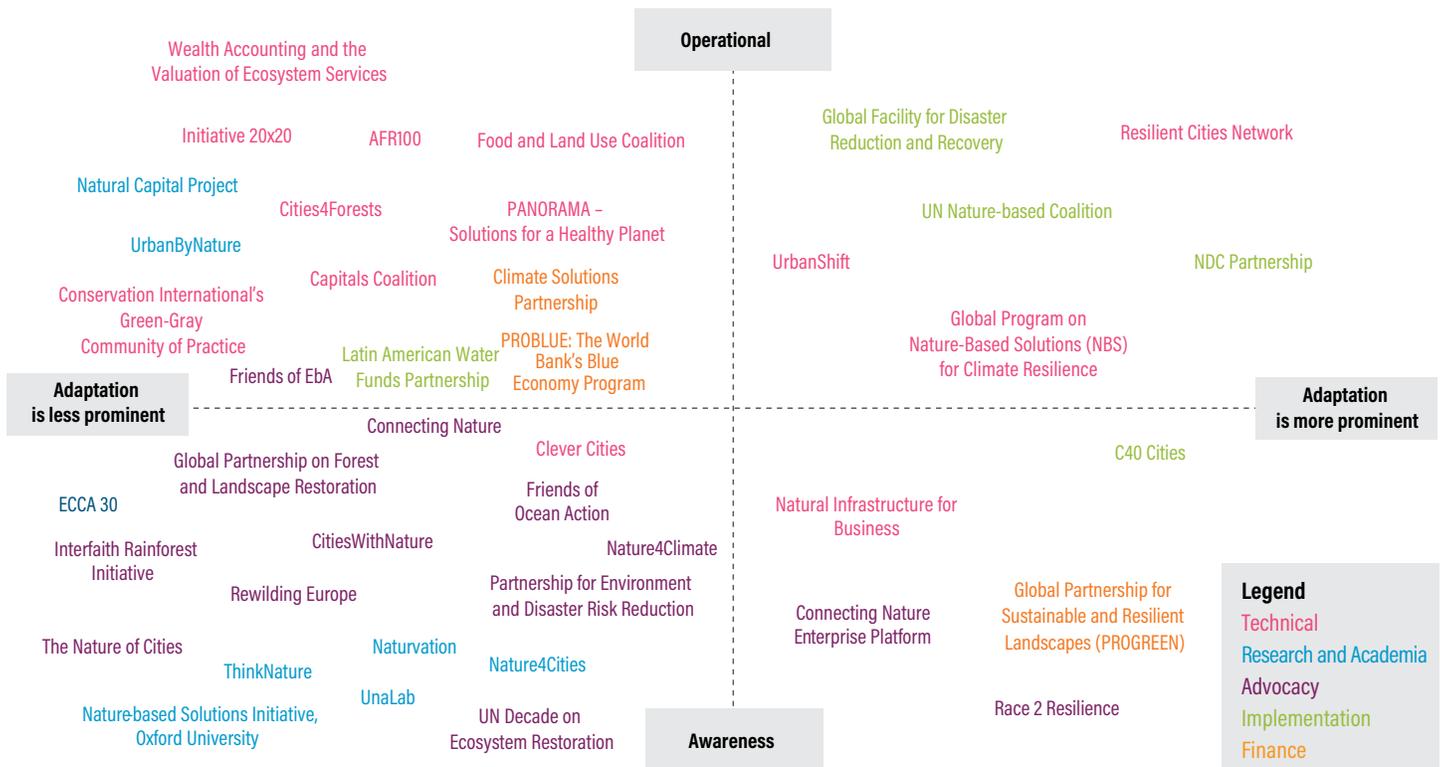
### 2.1 NBS-Centered Initiatives Targeted by This Paper

Thirty-six initiatives that promote NBS were identified as good targets for the research survey (for details, see Section 3 and Appendix C). The initiatives represent those working on nature-centric interventions and focused at the city and country level. Their approaches to NBS range from awareness raising to implementing on-the-ground activities, with some of the initiatives also

providing funding for NBS implementation. To visualize the diversity of initiatives in terms of NBS offerings, the authors mapped each initiative using insights from desk research and input from the interviewees. The range of initiatives varies from those specific to NBS to others focused on traditional adaptation that explicitly mention adaptation in their core missions (Figure 2).

Responses to the survey were received from 16 of the 36 initiatives surveyed, including the African Forest Landscape Restoration Initiative (AFR100), Cities4Forests, and Initiative 20x20. Details about these 16 initiatives' objectives, NBS scopes, geographic coverages, and organizational partners, as well as the names of the 20 other initiatives surveyed, are listed in Appendix C.

Figure 2 | The Landscape of Nature-Based Solutions Initiatives and Funders Is Diverse



Notes: By working together and embracing a crosscutting approach, initiatives can maximize co-benefits across nature, mitigation, and adaptation. Quadrants on the left include initiatives that focus on nature-based solutions (NBS) for non-adaptation purposes, while quadrants on the right show initiatives that highlight adaptation. Each NBS initiative and funder has its own unique characteristics: some may be more operational, awareness-oriented, or financial in nature.

Abbreviations: AFR100 = African Forest Landscape Restoration Initiative; UN = United Nations; NDC Partnership = Nationally Determined Contribution Partnership.

Source: Adapted from Alliance for Global Water Adaptation. 2021, unpublished.

### 3. SCOPE AND METHODOLOGY

The methodology applied included a mix of qualitative and (to a lesser extent) quantitative methods: a literature and document review based on desk research, an online survey with corresponding analysis of results, and semi-structured interviews.

#### Desk Research and Document Review

The authors reviewed gray literature such as government documents, reports and evaluations, issue papers, materials detailing case studies, and more traditional literature such as academic articles on NBS and adaptation. The team also reviewed primary documents on the websites of AFR100 (national restoration strategies and Restoration Opportunities Assessment Methodology plans), Cities4Forests (materials about its founding and relevant city-level strategies), and Initiative 20x20 (national restoration plans). This review helped inform the baseline questions for the survey and identify other active NBS initiatives.

#### Two-Tiered Approach to NBS Initiatives and Survey Outreach

Given WRI's role in the management of AFR100, Cities4Forests, and Initiative 20x20, the authors had open access to the secretariat staff and to detailed information about these three initiatives. This proximity allowed for a deeper analysis of how they support adaptation through NBS and the identification of illustrative examples, described in boxes throughout the paper.

A second, broader group of external initiatives was also engaged to gain insights into the larger NBS ecosystem (initiatives involved broadly in conservation, reforestation, restoration, and other nature-based efforts; for details on how we chose these, see Appendix A). The authors reached out via email to 36 initiatives and received 67 survey responses from 16 initiatives: AFR100, Cities4Forests, CitiesWithNature, Conservation International's Green-Gray Community of Practice, C40 Cities, Food and Land Use Coalition, Friends of EbA, Global Facility for Disaster Reduction and Recovery/World Bank's NBS Community of Practice, Global Partnership on Forest and Landscape Restoration, Initiative 20x20, Latin American Water Funds Partnership, Nature4Cities, Naturvation, NDC Partnership, PANORAMA – Solutions for a Healthy Planet, and UrbanShift. This selection is not exhaustive given the universe of initiatives engaged in NBS globally.

Open-ended and multiple-choice questions probed the strengths and challenges of initiatives, the level of interest in and demand for adaptation, adaptation priorities and enabling conditions, and the role that NBS initiatives should play to accelerate NBS for adaptation (for questionnaire, see Appendix A). Authors analyzed and tagged responses before visualizing them in graphs.

#### Semi-structured Interviews

Based on a review of survey responses, follow-up interviews were undertaken with 25 staff members—chosen based on the level of engagement in implementation cases and the level of detail included in their survey responses—from the three primary initiatives to elaborate on how to overcome specific challenges and learn more about examples that highlight successful implementation of NBS for adaptation interventions (see Appendix B for the questionnaire).

#### Limitations

During the first weeks of the survey, WRI received a very low response rate from respondents, especially from initiatives in which WRI does not play a direct role. The authors countered this limitation by extending the survey multiple times and sending frequent, personalized reminders to respondents. It became apparent that Cities4Forests—an initiative with a large secretariat team—was proportionally overrepresented in the results (27 respondents, or 40 percent of the total, compared with other initiatives that had only a few or even single respondents). To reduce this bias, when visualizing results in a graph, the authors gave equal weight of one “point” to each initiative (regardless of the number of respondents per initiative) to better present the diversity of perspectives among initiatives.<sup>2</sup>

## 4. DISCUSSION OF SURVEY FINDINGS: ADAPTATION DEMAND, PRIORITIES, AND TYPES OF SUPPORT NEEDED

The majority (94 percent) of initiative secretariat staff surveyed indicated that NBS initiative users have a high or moderate demand for and interest in adaptation. In this context, the word “stakeholders” refers to the intended audience of the initiatives, which includes governments (both city and national), local partners (civil society organizations [CSOs], nongovernmental organizations [NGOs], academic institutions), and businesses they engage with to design, implement, and monitor NBS actions. Stakeholders’ interest in adaptation outcomes affirms a strategic opportunity to use existing NBS initiatives to more rapidly mainstream adaptation solutions in countries and cities around the world that are already interested in using NBS to achieve other goals like mitigation and conservation.

With the exception of five initiatives (AFR100, Friends of EbA, NDC Partnership, PANORAMA, and UrbanShift), most of the NBS initiatives surveyed were not created specifically to bring about adaptation benefits, but our research reveals they are nevertheless addressing adaptation to different degrees. One example is the work that AFR100 and partners are carrying out with the government and civil society in African countries. Box 1 examines the example of Malawi, where NBS solutions are being used to enhance resilience to both climate and non-climate impacts.

### The African Forest Landscape Restoration Initiative

A group of African nations and technical partners launched AFR100 in December 2015 during the 2015 UN Climate Change Conference’s Global Landscapes Forum. It is a country-led effort to bring 100 million hectares of land in Africa into restoration by 2030 (Figure 3). The initiative contributes to the Bonn Challenge, the African Resilient Landscapes Initiative, the African Union’s Agenda 2063, the SDGs, and other targets.

Through AFR100, national governments in Africa, public and private sector partners, international development organizations, and local communities are coming together to restore productivity to degraded landscapes

to sequester carbon, build climate resilience, and improve livelihoods in Africa. A second phase of AFR100—focused on channeling donor finance to implementation-ready projects across the continent—was launched in November 2021 during the 26<sup>th</sup> UN Climate Change Conference (COP26) that aims to mobilize \$2 billion to restore 100 million hectares by COP27 (AFR100 2021). Africa is the world’s most climate-vulnerable continent, and AFR100 sees restoration as a critical opportunity to lead and progress on both these fronts (AFR100 2021).

To date, 32 countries have committed to restoring 128 million hectares (representing 128 percent of the original target) of degraded land and forests across Africa. Twelve financial partners have earmarked \$1 billion in development finance and the private sector has pledged \$481 million for forest landscape restoration activities. AFR100 has 33 technical partners that provide technical assistance to member countries. The initiative is led by the African Union Development Agency with WRI participating as a steering committee member alongside the Food and Agriculture Organization of the United Nations, and Germany’s Federal Ministry for Economic Cooperation and Development.

### 4.1 Strengths of NBS Initiatives

Survey respondents emphasized that existing NBS initiatives’ top strengths include building strategic partnerships with their users, funders, and partners; building capacity; channeling technical assistance and knowledge sharing; and effectively engaging their users.

Respondents cited the value of initiatives’ bringing in relevant stakeholders to help tackle the initiatives’ objectives. Technical areas of success include diagnosing priority areas for NBS, setting goals, guiding or facilitating policies, implementing projects, and developing financing solutions. This suggests that once supporting NBS initiative staff are trained on adaptation tools and technical know-how they will be well-positioned to provide a similar level of technical support to initiatives’ stakeholders interested in adaptation.



## Box 1 | Malawi Advances Restoration to Achieve Development and Climate Adaptation Outcomes

With the help of national leadership, civil society, and other partners, Malawi is investing in large-scale restoration to promote prosperity and maximize climate adaptation benefits. Between 2000 and 2015, Malawi experienced an average annual deforestation rate of 0.5 percent.<sup>a</sup> Forest loss is driven mainly by agricultural expansion and high dependency on wood for cooking, heating, and charcoal production for market,<sup>b</sup> and is compounded by a population growing by 3 percent annually.

Since 2015, with support from AFR100 technical partners, the government of Malawi has been working to reverse forest loss by implementing large-scale landscape restoration,<sup>c</sup> motivated by widely recognized benefits such as improved food, water, and livelihood security for the country's growing population. These socioeconomic and environmental benefits also enhance climate resilience, for example, by providing families with additional income with which to recover from climate events and providing natural defenses against floods and rising temperatures. Framing NBS as an adaptation approach is common practice in Malawi and is also apparent in national documents pertaining to climate adaptation. For example, Malawi's National Adaptation Plan Framework, launched in 2020, mandates that natural resources (forest, water, soil, and land) be used sustainably and that conservation and restoration of ecosystems, especially forests, be enhanced. Similarly, its updated nationally determined contribution, submitted in July 2021, has over 75 adaptation priorities, of which 9 are in the "Biodiversity and Ecosystem" category.<sup>d</sup>

In 2016, Malawi pledged to restore 4.5 million hectares of degraded and deforested land by 2030 as contributions toward its AFR100 commitments. Malawi was one of the first countries in Africa to develop its National Forest Landscape Restoration Strategy (NFLRS). Under the NFLRS, Malawi seeks to revive its ecological functionality and improve human well-being in areas and landscapes facing deforestation and degradation. According to an interviewed expert, the government is working with various partners of AFR100 to operationalize the strategy, which has mobilized the creation of other policies, such as the National Agriculture Policy, the National Climate Change Policy, and the National Disaster Risk Management Policy (with a corresponding implementation strategy, the National Resilience Strategy, which covers and goes beyond climate risks).

According to country interviewees, there is now a movement in the political system to encourage domestic government financing for restoration activities, which would allow communities to begin restoration activities and reap adaptation benefits faster across the country.

Malawi still faces challenges operationalizing implementation of its strategies at the local, grassroots level due to insufficient capacities and finance. However, the country is seeing more partners—especially civil society networks—come onboard. It has laid the foundation for the implementation of frameworks and guidelines, which are to be accomplished through emerging national-level grants. Thanks to national leadership, civil society networks, and assistance from development partners, Malawi's government is developing subnational programs to improve local capacity to plan, implement, monitor, and report restoration interventions and progress.

Notes: <sup>a</sup> Republic of Malawi 2017. <sup>b</sup> Ngwira and Watanabe 2019. <sup>c</sup> Republic of Malawi 2017. <sup>d</sup> Government of Malawi 2020; 2021.

Initiatives are offering an effective space to exchange lessons learned and experiences among users, identify knowledge gaps, and transfer needed information to relevant members within their broad networks. These established knowledge-sharing and user-engagement systems can help accelerate the use of NBS for adaptation.

### 4.2 Challenges Faced by NBS Initiatives

Responses from the survey and interviews shed light on the challenges that initiatives face, the most prominent of which are insufficient funding to meet stakeholder demand; limited capacity to provide adaptation-specific technical assistance to users; program implementation challenges due in part to the proliferation of NBS initiatives working on similar issues without adequate coordination; and the difficulty of developing appropriate monitoring, evaluation, and learning (MEL) systems.

All of these challenges can make it difficult to expand existing NBS initiatives to include adaptation. Even as initiatives recognize the value of NBS for adaptation, they face the tension of how to sufficiently allocate already scarce resources and the need to build adaptation-related capacities. For example, NBS initiatives already contend with challenges in appropriately funding the collection of data for objectively verifiable NBS indicators for MEL, including those for adaptation, and to do so over time frames that allow initiatives to build the long-term evidence base to demonstrate the impact of NBS. To date, initiatives largely make use of anecdotal data, which limits their ability to make compelling social and economic cases to funders, partners, and users.

### 4.3 Initiative Participants' Adaptation Priorities as Perceived by NBS Initiative Secretariat Staff

In response to an open-ended survey question on the perceived adaptation priorities of initiative stakeholders, respondents representing the 16 initiatives surveyed identified issues that we then categorized into groups based on similarity and graphed. The top five adaptation priorities that emerged were improved water access and management; urban flooding; general flooding protection; increased food security; and reduced heat stress.

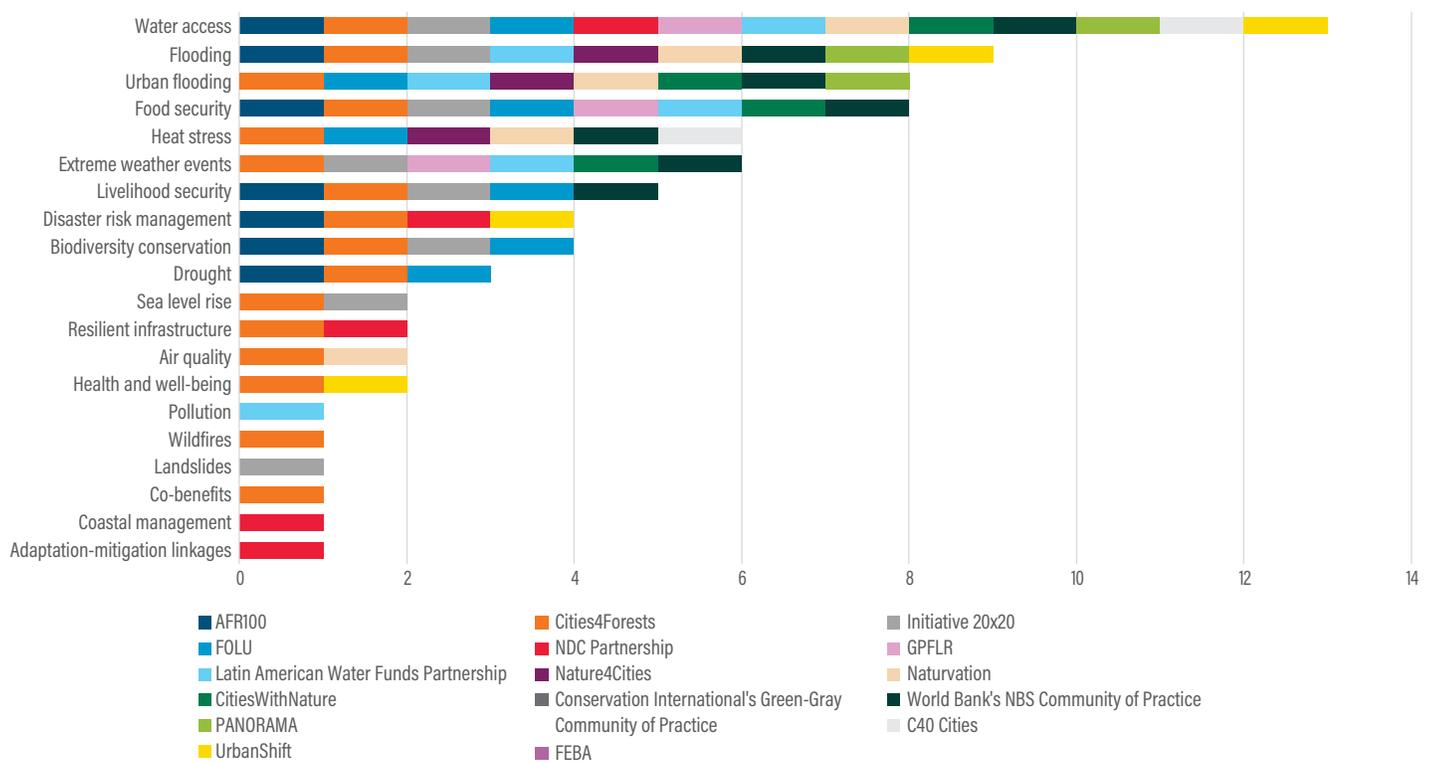
However, as shown in Figure 4, not all priorities identified by survey respondents fall within what are usually considered adaptation priorities (e.g., pollution, biodiversity conservation), revealing possible ambiguity around how they interpret and conceptually understand adaptation.

### 4.4 Aspects of NBS Initiatives that Enable the Integration of Climate Adaptation Considerations

When asked how climate adaptation considerations are integrated into their respective initiatives, respondents listed the following:

- Initiative provides some level of technical guidance and support on adaptation (highest response rate representing 14 initiatives)
- Climate risks and adaptation are included in the initiative's objectives (responses representing 13 initiatives)
- Initiative shares adaptation information with its members (responses representing 13 initiatives)
- Initiative provides some financial support for work that at times includes climate adaptation considerations (responses representing 9 initiatives)

Figure 4 | Survey Respondents' Perceptions of Their Users' Climate Adaptation Priorities



Note: Abbreviations: NBS = nature-based solutions; AFR100 = African Forest Landscape Restoration Initiative 100; NDC Partnership = Nationally Determined Contribution Partnership; FOLU = Food and Land Use Coalition; GPFLR = Global Partnership on Forest and Landscape Restoration; FEBA = Friends of Ecosystem-based Adaptation.

Source: Authors.

Despite the awareness of adaptation, one interviewee noted that adaptation is not generally an “entry point” or part of the main framing or narrative.

Survey respondents, choosing from a predetermined list of options, were asked to select the most important aspects of NBS initiatives that help incorporate adaptation. The top selections included the following:

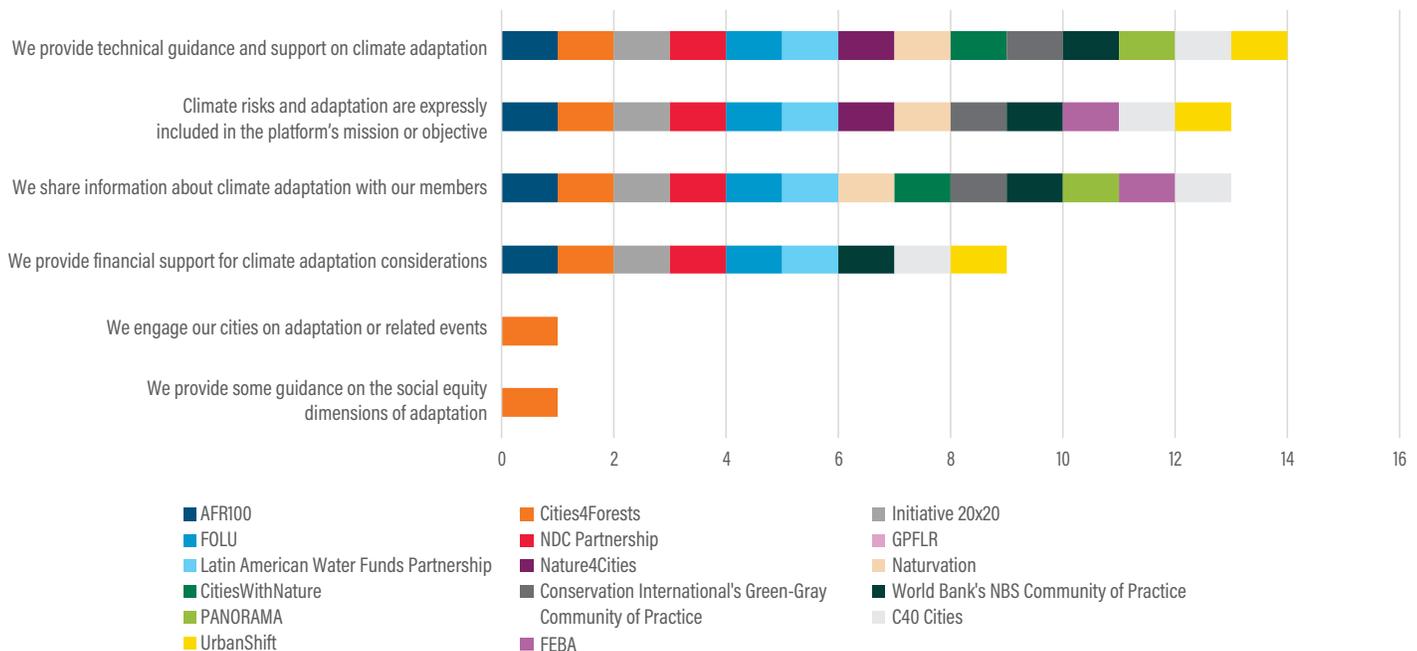
- Greater awareness about the role of NBS for adaptation
- Provision of relevant data and information
- Peer-to-peer learning and sharing
- Formation of strategic partnerships
- Relevant gatherings between NBS and adaptation stakeholders

Of the seven options provided, access to NBS finance for adaptation scored the lowest, preceded by the ability to provide specialized technical assistance on adaptation. Figure 5 depicts these responses.

## 4.5 Types of Support and Activities Noted by Initiative Staff that Could Help Them Spur More Action around Adaptation

The survey question on the types of support and activities needed by initiative staff to enable greater NBS for adaptation garnered 67 responses. Facilitating better access to NBS finance for adaptation activities was the number one type of support selected from a predetermined list of options, noted by most respondents from all 16 initiatives surveyed. Specialized technical assistance to build capacity for their teams to provide adaptation support tied for the second most-needed type of support, alongside the need for peer-to-peer learning and sharing. Next, responses representing 12 initiatives highlighted that they need support to better provide relevant adaptation data and information. For full details on which and how many initiatives were represented for different types of support, see Figure 6.

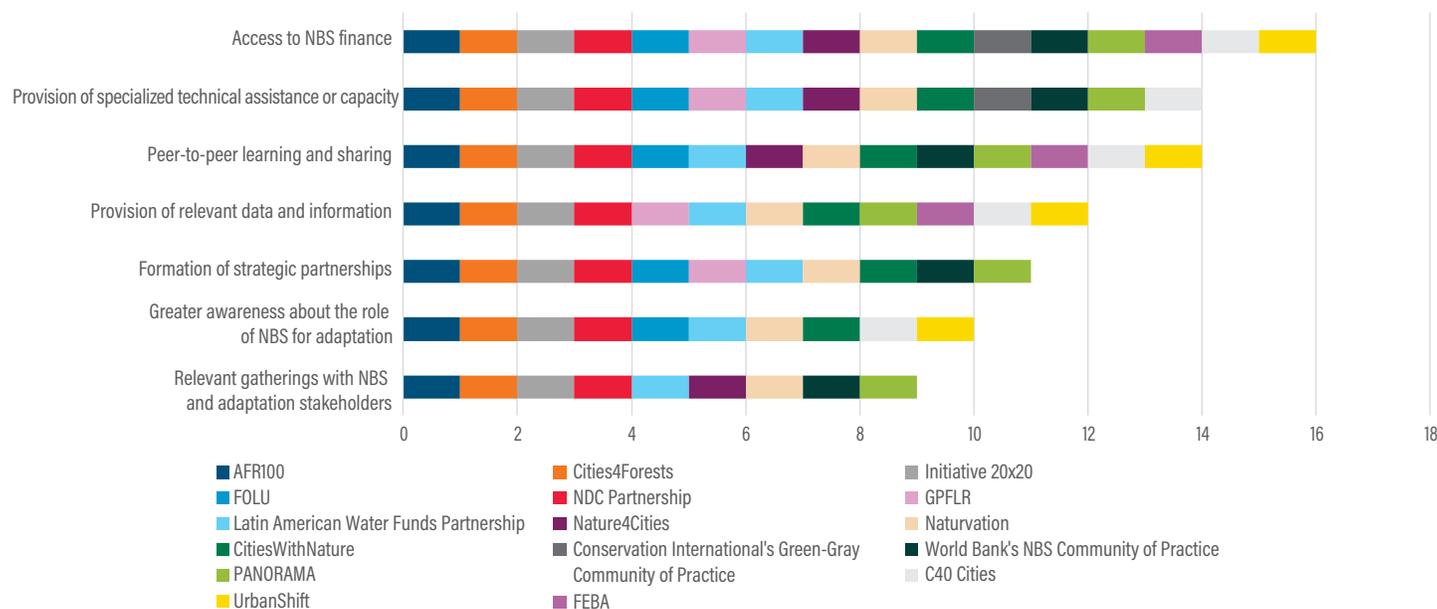
Figure 5 | Existing Aspects of Nature-Based Solutions Initiatives that Indicate the Integration of Climate Adaptation Considerations



Note: Abbreviations: NBS = nature-based solutions; AFR100 = African Forest Landscape Restoration Initiative 100; NDC Partnership = Nationally Determined Contribution Partnership; FOLU = Food and Land Use Coalition; GPFLR = Global Partnership on Forest and Landscape Restoration; FEBA = Friends of Ecosystem-based Adaptation.

Source: Authors.

**Figure 6 | Survey Respondents' Perceptions of the Types of Support and Activities that Could Help Them Spur More Action around Adaptation through Nature-Based Solutions Initiatives**



Note: Abbreviations: NBS = nature-based solutions; AFR100 = African Forest Landscape Restoration Initiative 100; NDC Partnership = Nationally Determined Contribution Partnership; FOLU = Food and Land Use Coalition; GPFLR = Global Partnership on Forest and Landscape Restoration; FEBA = Friends of Ecosystem-based Adaptation.

Source: Authors.

#### 4.6 Perceived Current and Future Roles of NBS Initiatives in Raising Awareness of NBS for Adaptation and Generating Momentum

The top two responses to an open-ended question on the current role of NBS initiatives in building momentum for adaptation action were knowledge-sharing and awareness-raising (based on responses representing 12 and 10 initiatives, respectively). These were followed by building strategic partnerships and providing adaptation-specific technical assistance to initiative users.

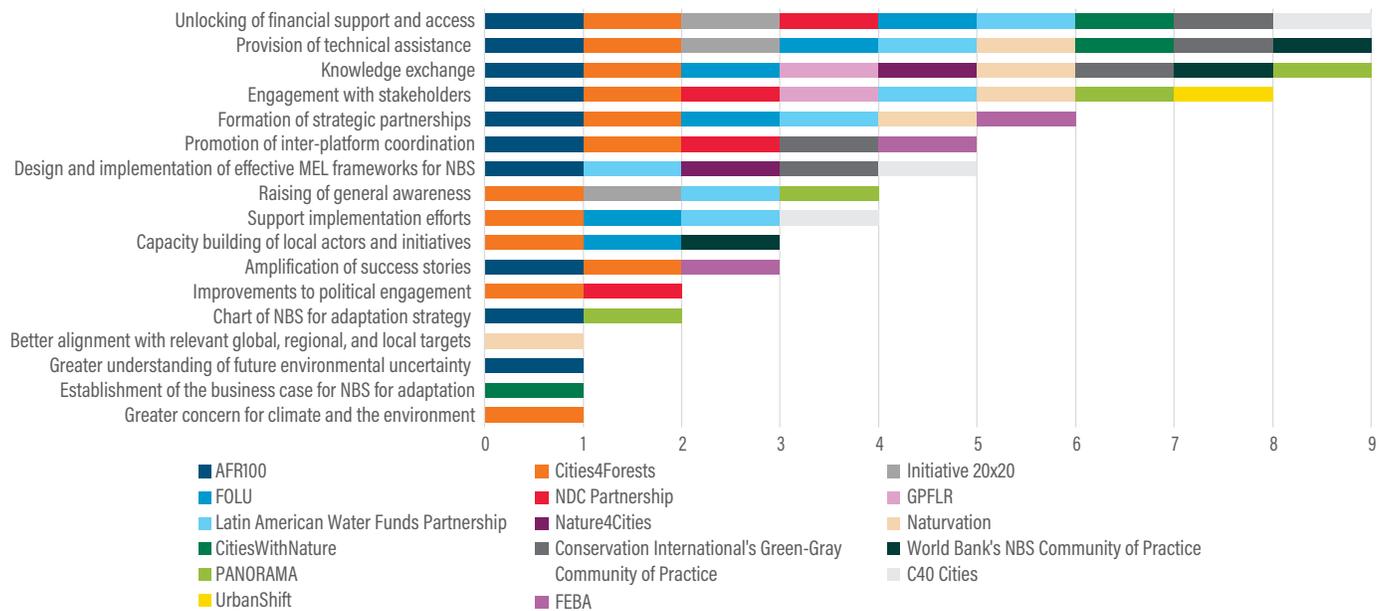
When asked what they believe the *future* role of NBS initiatives should be to advance adaptation (Figure 7), respondents ranked unlocking financial support and financial access first—echoing sentiments that access to finance is currently last in line for current offerings but first in line for what could increase action (see Figures 5 and 6, respectively). Knowledge-sharing and providing technical assistance tied with finance access, followed by engaging and convening stakeholders (e.g., decision-makers, adaptation practitioners, researchers).

#### 5. KEY OPPORTUNITIES FOR NBS INITIATIVES TO ENHANCE AND SCALE CLIMATE ADAPTATION

Our research identified a number of opportunities and strategies NBS initiatives could use to advance adaptation outcomes:

- Improving coordination among NBS initiatives and their partners to advance climate adaptation efforts
- Incorporating learning from existing adaptation-oriented organizations already focusing on NBS
- Investing in NBS for adaptation pilots to open the door for larger initiatives and employing NBS initiatives' expertise in accessing and mobilizing finance to attract funding for adaptation
- Ensuring that the positive impacts of NBS for adaptation reach vulnerable groups that disproportionately bear the double brunt of climate impacts and ecosystem degradation
- Harnessing the current political momentum surrounding NBS for adaptation, in part by advancing the evidence and socioeconomic case for NBS for adaptation

**Figure 7 | Survey Respondents' Recommended Future Roles of Nature-Based Solutions Initiatives to Advance Climate Adaptation**



Note: Abbreviations: MEL = monitoring, evaluation, and learning; NBS = nature-based solutions; AFR100 = the African Forest Landscape Restoration Initiative 100; NDC Partnership = Nationally Determined Contribution Partnership; FOLU = Food and Land Use Coalition; GPFLR = Global Partnership on Forest and Landscape Restoration; FEBA = Friends of Ecosystem-based Adaptation.

Source: Authors.

## 5.1 Improving Coordination among NBS Initiatives and Their Partners

According to interviewees and survey respondents, NBS initiatives could better coordinate and collaborate with one another and relevant partners to leverage each other’s strengths to expand and scale NBS for adaptation. Initiatives could connect regional partners to share lessons and expertise as well as implementation experiences from around the globe to help national and subnational stakeholders integrate NBS for adaptation into policy and law. Such information could also help address planning and implementation needs.

To overcome the tendency of governments to approach climate challenges in a fragmented manner—including those faced by multiple sectors, for example—initiatives could engage with multiple national and subnational agencies to co-create modalities that bring traditionally siloed departments together. Initiatives could help governments encourage stakeholders and political actors to work together to implement and maintain adaptation measures at community and landscape levels. This would

include involving local organizations and actors, especially since both NBS and adaptation needs are very context-specific, as illustrated by the El Salvador example in Box 2 and the Fiji example in Box 3.

## 5.2 Incorporating Learning from Adaptation-Oriented Organizations

Our research showed that while NBS are frequently used by the adaptation community, NBS initiatives do not typically use adaptation goals as an entry point to engage with users. Rather, initiatives “tend to be focused on the ecosystem, not the human system as much. We’re focusing on the means instead of focusing on the end,” according to an interviewee.

As global awareness of the value of NBS increases, NBS initiatives may act as forums, fostering dialogue and collaboration while increasing awareness among peer initiatives of the linkages between adaptation and NBS. More initiatives could pursue adaptation as a goal and

highlight the benefits of NBS for meeting adaptation needs. Initiatives could showcase tools and techniques for NBS for adaptation to enhance knowledge exchange among communities, users, and technical communities. NBS initiatives that do not already include adaptation could also engage with dedicated adaptation initiatives and practitioners to share expertise.

A prominent example of an adaptation-focused effort is Initiative 20x20,<sup>3</sup> which was launched at COP20 in Lima in November 2014 in support of the Bonn Challenge, the New York Declaration on Forests, and other global commitments to reduce and ultimately end deforestation.

### Initiative 20x20

This country-led effort is seeking to change the dynamics of land degradation in Latin America and the Caribbean with the goal of bringing 20 million hectares of degraded

land under protection and restoration by 2020 and 50 million hectares by 2030 (Figure 8). Initiative 20x20 will thereby promote resilience to climate change, improve livelihoods—especially for lower-income and rural communities—support biodiversity, and enhance water and food security across the continent.

To date through the initiative, 18 Latin American and Caribbean countries and three regional programs have committed to restoring more than 52 million hectares of land (or about 124 million acres, an area roughly the size of Paraguay and Nicaragua combined). These ambitions are supported by 97 technical organizations and 25 financial partners, including impact investors who have earmarked \$2.5 billion in private investment for restoration activities in the region.<sup>4</sup> The initiative harnesses the expertise and capacity of these partners to drive restoration forward across the region.

Figure 8 | Initiative 20x20 Restoration Commitments Are in the Millions of Hectares by Country

Beginning to protect and restore **50 million** hectares of land in Latin America and the Caribbean by 2030.

**COMMITMENTS**  
**52.6 mha** by governments  
**\$2.5 B** of private sector capital



Notes:  
 \*Goals to be accomplished by 2030  
 \*\*Commitment to define a national restoration strategy

Note: Abbreviations: mha = million hectares; B = billion; TBD = to be determined.

Source: Initiative 20x20. n.d. "Restoring Latin America's Landscapes." <https://initiative20x20.org/restoring-latin-americas-landscapes>. Accessed January 10, 2022.

As the secretariat of Initiative 20x20, WRI facilitates the dialogue among governments, civil society, and the private sector to build an effective coalition that can achieve the initiative's restoration goals. Through the Madrid Declaration on Restoration, announced in 2019, Latin American and Caribbean ministers forming part of Initiative 20x20 recognize restoration as a climate action, focused on decarbonization (Initiative 20x20 2019). The 2021 Ministerial Communication highlights restoration as both a mitigation and adaptation measure, showing a shift toward incorporating adaptation (Initiative 20x20 2021).

### 5.3 Investing in Pilots and Smaller NBS for Adaptation Projects to Open the Window for Broader Funding and Initiatives

Limited finance is a frequent bottleneck to scaling NBS for adaptation. Pilot funding and early-stage investment present opportunities to permit a critical mass of NBS pilots and early-stage projects to take place around the world, in some of the most challenging conditions. These first projects are also an important precursor to accessing finance to scale and move NBS for adaptation to a broader, programmatic level. There are self-sustaining programs,

for example, in Guatemala and Costa Rica, where the governments have defined provisions for financing NBS within their countries' budgets,<sup>5</sup> but they first needed grant-funded opportunities to show that NBS can work for different goals, including adaptation. Box 3 exemplifies the value of NBS for adaptation pilot projects in Fijian villages and their capacity to scale.

Initiatives could facilitate access to investment finance and address the financial readiness gap that is typical of NBS projects, leveraging their expertise and networks to unlock NBS finance for adaptation (a gap noted in Figure 6). NBS for adaptation projects may be challenged to establish creditworthiness and a definite return on investment, and those who propose them may require technical assistance to quantify benefits, demonstrate cost-effectiveness, perform due diligence, conduct necessary pre-feasibility assessments, and develop business models and links with de-risking facilities. Existing NBS initiatives could help adaptation-oriented users overcome these readiness gaps by building stronger concepts and financial cases. Likewise, they could play a critical role in integrating adaptation and resilience into traditional green-gray infrastructure projects.

#### Box 2 | Strategic Partnerships and International Collaboration Help Scale National Reforestation Efforts for Mitigation and Adaptation Outcomes in El Salvador

El Salvador is among the countries with the highest vulnerability to climate change.<sup>a</sup> It is located in the dry corridor of Central America, a stretch of land that includes Guatemala, Honduras, and Nicaragua and is characterized by long periods of drought followed by intense and sudden rain.<sup>b</sup> The country is exposed to hurricanes and storms from the Pacific and Atlantic Oceans. Vulnerable groups include smallholder farmers and rural communities, many of whom have limited resources and technical capacity to cope with climate impacts.<sup>c</sup>

In the late 2000s, El Salvador experienced an increase in extreme weather events. The country experienced huge losses with Hurricanes Agatha, Ida, and Mitch, and other storm systems. The loss of life and economic damage caused by these events sparked greater political will for action on readiness and adaptation. According to an interviewed expert, the Ministry of Environment recognized the high degree of ecosystem degradation and the associated likelihood of suffering damages and losses from weather events as a result. With this public awareness, the government integrated

climate change into the Law of Environment to pave the way to a resilient and low-carbon economy. The National Program for the Restoration of Ecosystems and Landscapes was also enacted to promote landscape-scale forest restoration.<sup>d</sup> Through Sustainable Local Development Plans, the government of El Salvador promoted restoration activities that included local stakeholders in developing and implementing restoration activities aligned with their own priorities to ensure the program's success in the long term. Initiatives such as Initiative 20x20 and the Bonn Challenge allowed authorities to access technical knowledge by linking them with organizations with high expertise in restoration, permitting the co-creation of the Sustainability Index, which includes adaptation indicators.

El Salvador will continue to be exposed to climate risks and adaptation remains at the center of its agenda. Meanwhile, country officials recognize the value they have derived from initiatives including lessons learned, opportunities to harmonize programs across the region, and the importance of setting goals and ambitions to enhance resilience.<sup>e</sup>

Notes: <sup>a</sup> ND-GAIN 2019. <sup>b</sup> Jirón Zavala 2021. <sup>c</sup> Salazar et al. 2019; Pacillo et al. 2021; IFAD 2015. <sup>d</sup> MARN 2018. <sup>e</sup> Imbach and Vidal 2019; MARN 2021.

**Box 3 | Upscaling Nature-Based Solutions Helps Prevent Damage from Flooding and Improves Livelihoods in Fiji**

Small island developing states are some of the hardest hit areas when it comes to climate change, but are responsible for only a fraction of the emissions causing it.<sup>a</sup> Fiji is no exception, plagued by riverine and coastal flooding and threatened by sea level rise and the increasing frequency and severity of storms and cyclones, which are estimated to be responsible for annual losses equivalent to 5.8 percent of its gross domestic product.<sup>b</sup>

Over the past 30 years, the Fijian government has relied on built infrastructure to mitigate impacts. Seawalls and concrete riverbanks are expensive to construct and maintain, and the challenge is compounded by shrinking domestic budgets for flood defenses, along with increasing requests from vulnerable communities for preventative assistance and disaster relief. In response, as reflected in its National Adaptation Plan, the Fijian government has tapped into growing global awareness about the role of NBS for climate adaptation and disaster risk reduction and begun exploring the role of green and hybrid infrastructure to mitigate the climate risks the country faces.

In 2009, with modest seed funding of \$200,000 from the Embassy of South Korea, the government of Fiji trialed a pilot NBS approach to address riverine and coastal flooding using vetiver grass. This resilient species of grass, native to Southeast Asia, has a deep root system that helps to stabilize soil, slow surface water runoff, and mitigate flooding. It also provides material for many other uses such as roofing thatch, livestock feed, and artisan crafts. Vetiver grass has been used by communities in Fiji since the 1950s, but its use as a strategic NBS solution for flooding mitigation is now being scaled.<sup>c</sup>

Additional external funding led to the government's creation of a vetiver grass nursery training program in 2019 for local community members in multiple villages.<sup>d</sup> Laborers from pilot communities were hired to plant the grass alongside riverbanks, generating an economic boost while building the riverbanks' resilience to riverine flood events, which are expected to increase in frequency due to climate change.<sup>e</sup> This initiative was trialed in 30 villages through existing networks such as church groups, women's organizations, and local CSOs and NGOs. Anecdotal evidence indicates success as measured by fewer community requests for preventative assistance and disaster relief received by the government.

The success of the vetiver grass NBS program is now being scaled with additional funding to coastal areas at risk of storm surges, where decaying built infrastructure such as seawalls are being fortified with mangroves as the first line of defense and vetiver grass as the secondary barrier.

The combination of critical enabling factors, including political leadership from the prime minister, seed funding from the Korean Embassy, a willingness by local people to trial new approaches in the face of failing concrete defenses, and interest from additional funders to expand the program demonstrate the potential of NBS for adaptation when used in the right context and for the right purpose.

Notes: <sup>a</sup> UNFCCC 2005. <sup>b</sup> UNCDF 2020. <sup>c</sup> Truong and Creighton 1994; Ledwell 2019. <sup>d</sup> Vanoh 2020. <sup>e</sup> Ledwell 2019.

## 5.4 Improving Social Equity Outcomes

Climate change often directly impacts people living in poverty, communities that depend on natural resources for their livelihoods, and other vulnerable groups when their communities and the resources they depend on are damaged. Groups facing systemic inequities, such as ethnic minorities and women, are also disproportionately affected by climate change. Local actors often perceive these issues holistically rather than in a disconnected way, making them well-equipped to help identify adaptation priorities and measures, which are inherently local (Mfitumukiza et al. 2020).

Making the social impacts of NBS activities more beneficial and equitable is imperative. Including local actors' perspectives and priorities in the full project cycle, including results monitoring, is key to enhancing the climate resilience of both ecosystems and vulnerable

groups, and to avoiding unintended harm. Tracking these benefits would add to the evidence base of NBS for adaptation, therefore making a stronger, more visible economic and social case for action, leading to greater buy-in. For example, protecting urban forests to mitigate flooding and extreme rainfall in and around cities can protect residents living in informal settlements from climate change impacts while improving their quality of life through increased air quality (Reid 2020).

The opportunity for NBS initiatives to better identify and communicate the many benefits of NBS for adaptation to funders and partners is clear, as is the need to break down operational silos and promote the exchange of best practices and lessons learned to help vulnerable groups.

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## 5.5 Harnessing the Current Political Momentum on NBS for Adaptation

As countries and cities grapple with climate change and place this crisis at the top of political agendas, an opportunity exists for NBS initiatives to better engage with national and subnational political leadership to promote NBS as an adaptation pathway. This increased attention presents an opportunity for NBS initiatives to further incorporate nature-based adaptation solutions and place them on the fast track toward implementation.

More than 66 percent of signatories to the Paris Agreement included NBS in their climate commitments, although the majority of these commitments have not yet translated into robust, evidence-based targets (Seddon et al. 2020). During COP26 in November 2021, NBS was a key theme and it became apparent that the climate crisis cannot be tackled without nature (Paxton 2021). Additionally, an analysis of the updated nationally determined contribution (NDC) adaptation components submitted by June 30, 2021, found that countries had committed to 89 percent more adaptation priorities with linkages to NBS in their updated NDCs compared with their first submissions (Dixit et al. 2022). While the increase was not uniform across countries, the findings reflect parties' desire to improve commitments to nature in adaptation through the Paris Agreement's iterative cycle of NDC enhancement. Box 4 examines the specific case of Mumbai, India, a city that is experiencing growing political will to harness NBS for adaptation goals.

### Cities4Forests

Cities4Forests<sup>6</sup> was launched in September 2018 at the Global Climate Action Summit in San Francisco, with 45 founding city members. It supports cities worldwide in recognizing their interdependence with the world's forests, and helps them use their own political, economic, and cultural power to protect and manage those forests for improved human well-being. In 2021, the Cities4Forests Call to Action on Forests and Climate urged national and subnational governments to demonstrate their commitments to climate mitigation and adaptation through forests, and Cities4Forests pledged to work with cities on these issues (WRI 2021).

Cities4Forests helps its member cities prioritize exercises and other resources to better conserve, manage, and restore their inner forests (such as city trees, urban parks,

and natural areas), nearby forests (such as watersheds), and faraway forests (especially tropical forests). The initiative raises awareness of the benefits of forests and other nature-based solutions—especially for climate, water, biodiversity, and human health and well-being—by inspiring political action and engagement; providing technical assistance and capacity building; and facilitating economic analysis, finance, and investment.

Cities4Forests was founded by World Resources Institute, Pilot Projects Design Collective, and the communications agency REVOLVE. The initiative currently engages 82 cities around the world, involving mayors' offices and other city agencies such as public water utilities and offices of sustainability (Figure 9).<sup>7</sup> Cities4Forests encourages peer-to-peer learning and connects cities with technical support from institutions with expertise in cities, forests, the climate crisis, water, communications, finance, policy, and social equity.

## 6. RECOMMENDATIONS

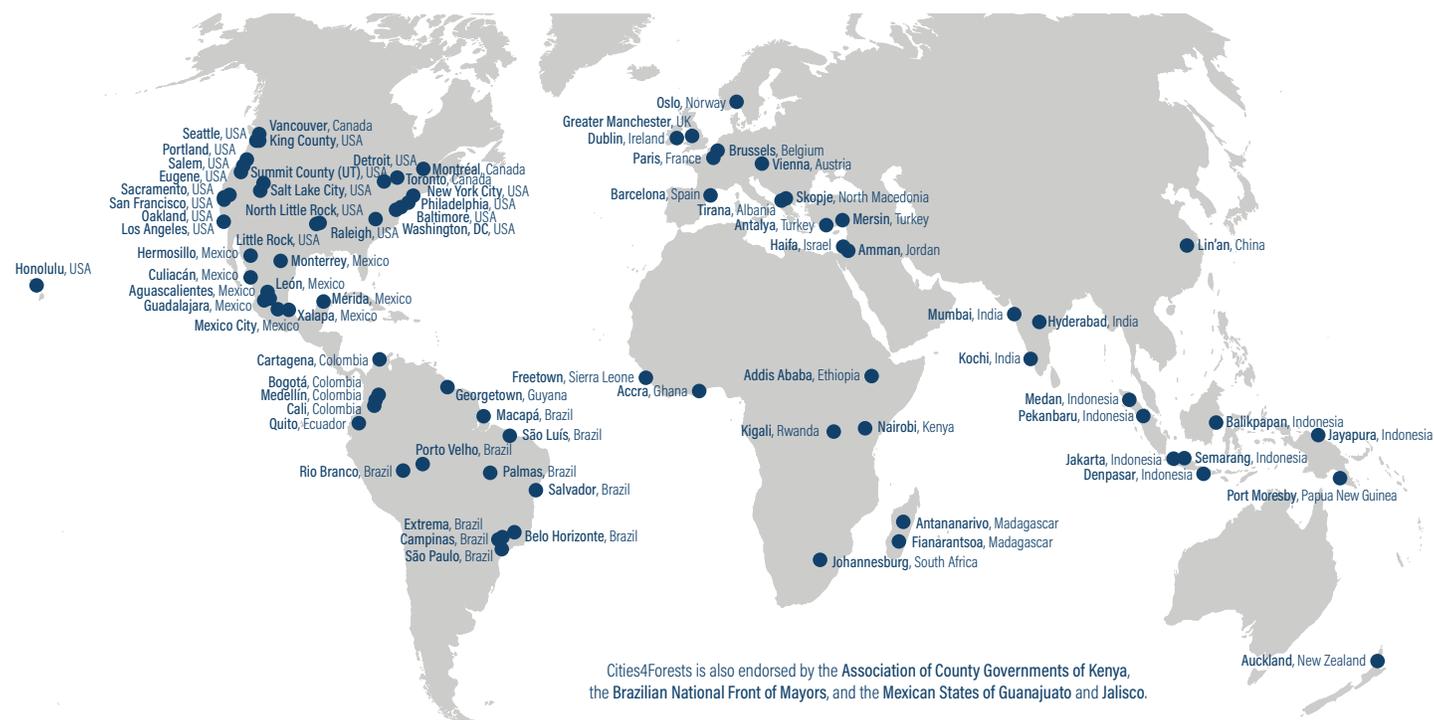
We present five recommendations for NBS initiatives and their funders to achieve greater adaptation outcomes in the next decade and inspire more commitments and investments. Three recommendations straddle both groups, as depicted in Figure 10.

### 6.1 Recommendations to Funders

Invest in existing initiatives as reliable vehicles to scale NBS for adaptation

Rather than fragmenting investments through other vehicles, adding adaptation content to existing initiatives is a high-impact, cost-effective scaling opportunity. Large audiences, from cities to national governments and civil society organizations, already engage with NBS initiatives. For example, Cities4Forests works with 82 cities, reaching over 300 million people, and AFR100 and Initiative 20x20 work with dozens of countries in Africa and Latin America. Funders can reach these audiences and help mainstream climate adaptation if they invest in delivering more adaptation content through existing initiatives and encourage those that focus on NBS for mitigation and other environmental services to include more adaptation in their activities.

Figure 9 | **Cities4Forests Has 82 City Members around the World (as of March 2022)**



Source: WRI (World Resources Institute). Last updated 2022. "About Cities4Forests." <https://www.wri.org/our-work/project/cities4forests/about-cities4forests>.

### Box 4 | **Growing Political Will in Mumbai Enhances Traction for Nature-Based Solutions to Tackle Extreme Heat and Mitigate Flooding**

Constructed primarily on land reclaimed from the sea, Mumbai is one of the world's largest cities and, given its low-lying position on India's west coast, ranks second on the global list of cities at risk from sea level rise, floods, and extreme weather events.<sup>a</sup> It is a densely populated city and India's largest, with over 22 million inhabitants in the metropolitan area. Over half of the population lives at great risk in informal settlements,<sup>b</sup> making residents important stakeholders in urban climate resilience planning efforts. The risks of climate change for Mumbai, its residents, and the Indian economy are immense.

Rapid and unplanned urbanization has led to a 43 percent decrease in green cover over three decades<sup>c</sup> and is linked to increased risks to Mumbai's residents from extreme heat—a growing social and economic issue in India as a whole, where it is estimated that 39 percent of all working hours were lost due to extreme heat in 2019.<sup>d</sup> Flooding from heavy rainfall and swollen rivers are also growing risks. Mumbai, a city historically safe from cyclones, experienced Cyclone Nisarga in 2020 and may suffer more frequent storms in the near future,<sup>e</sup> putting the city at even greater flood risk. The city's location on the coast puts it at extreme risk from sea level rise and monsoon flooding, with some experts predicting that the city will be engulfed by the sea by 2100 if carbon emissions continue at the current pace.<sup>f</sup>

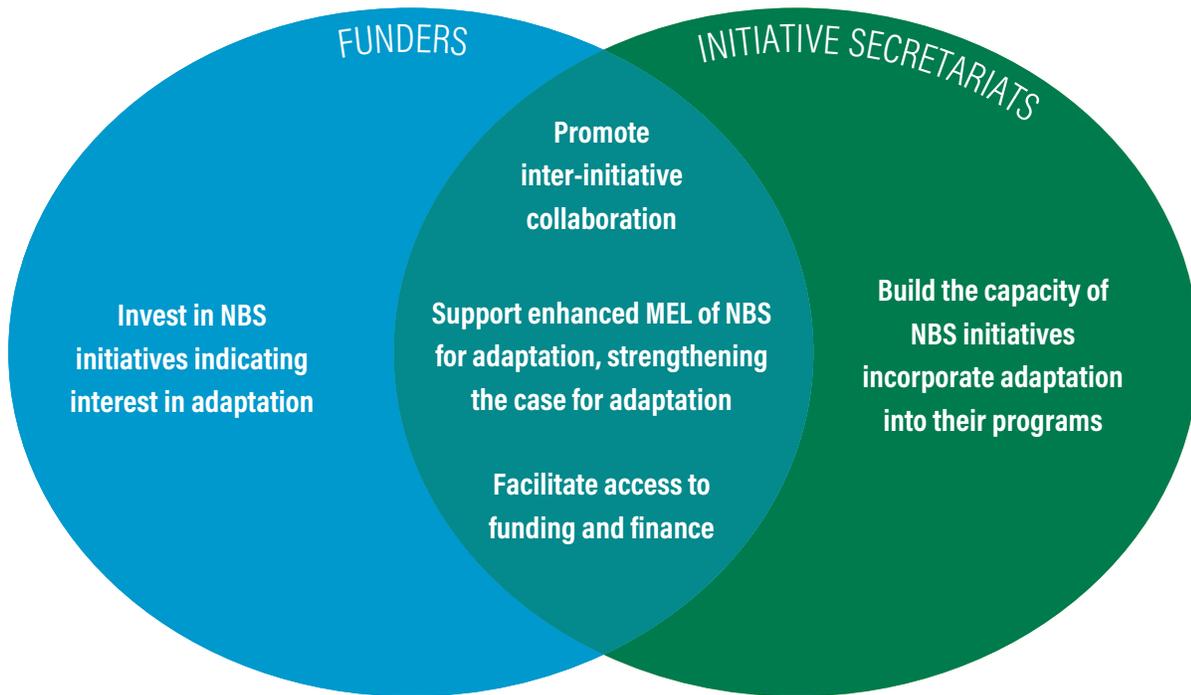
However, in recent years, there has been strong and growing political momentum for NBS for adaptation in Mumbai, according an expert interviewee. Mumbai is actively working to restore and protect its natural reserves and integrate them into the city's development processes. In 2020, through the domestic budget allocated to Mumbai by the Environment and Climate Change Department of Maharashtra State for the Majhi Vasundhara Abhiyan ("My Earth Campaign"), the Municipal Corporation of Greater Mumbai planted 162,000 trees and established coastal improvement and beach nourishment projects along the Dadar Chowpatty promenade to restore the city's sandy beaches, which helps mitigate coastal flooding during strong storm events.<sup>g</sup>

The political support for NBS and climate action recently led Mumbai to join two relevant global initiatives: C40 Cities and Cities4Forests, which it joined in December 2020 and July 2021, respectively. With support from C40 Cities and WRI India, Mumbai developed the city's first Climate Action Plan,<sup>h</sup> which details the city's immediate steps to mitigate and adapt to the impacts of climate change, including by leveraging the role of NBS (BMC 2022).

In Mumbai, the newfound political support for NBS has kickstarted NBS for adaptation projects, improved access to funding for implementation, and enabled development of a shared agenda among stakeholders.

Notes: <sup>a</sup> Abadie et al. 2020. <sup>b</sup> Satterthwaite et al. 2020. <sup>c</sup> Rahaman 2021. <sup>d</sup> Watts et al. 2020. <sup>e</sup> DeNoia Aronsohn 2017. <sup>f</sup> IPCC 2021. <sup>g</sup> *The Economic Times* 2021. <sup>h</sup> Read more about Mumbai's Climate Action Plan here: <https://mcp.mcgm.gov.in/>.

Figure 10 | Recommendations Directed at Funders and NBS Initiative Secretariats



Note: Abbreviations: NBS = nature-based solutions; MEL = monitoring, evaluation, and learning.

Source: Authors.

Our survey results highlight the benefits to initiative beneficiaries, as perceived by the initiative staff, that could be tapped into. Perceived benefits include promoting information exchange; raising ambition among peers; aligning efforts with global goals, which in turn encourages higher ambitions; and demonstrating leadership at the international level. Initiatives present an already-established opportunity for funders to leverage these advantages and align them more directly with adaptation outcomes. Existing initiatives offer additional attributes: established infrastructure for engagement, economies of scale, and the chance to establish cross-initiative coordination. Another benefit is that the same city or country staff who are charged with both mitigation and adaptation often look to these initiatives for support, making initiatives an efficient means of delivering adaptation content.

## 6.2 Recommendations to Funders and Initiatives

Promote inter-initiative complementarity and collaboration to fill gaps, leverage initiatives' strengths, and develop global programs that can accelerate adaptation action

The “NBS rush” experienced in the past five years has resulted in a proliferation of initiatives and organizations working on various aspects of NBS around the world. Some of these initiatives include adaptation content, while most do not. To better leverage initiatives' unique strengths and offerings and engage initiative stakeholders in a coordinated and additive way, funders and initiative secretariats alike need to promote inter-initiative collaboration with an eye toward streamlining competing offers and meaningfully including local actors such as subnational governments and local organizations.

In addition, to unlock large pools of grant finance from multilateral agencies and governments, initiatives must do more to develop an organized strategy that does not risk duplicating efforts or employing competing approaches in similar contexts. Funders have a unique role to play here as they can require organizations and initiatives to collaborate on large proposals.

Support improvements in monitoring, learning, and evaluation of NBS for adaptation to strengthen the case for adaptation

Increasing support for more robust MEL of NBS for adaptation projects and programs would allow initiatives to better harness empirical evidence to make the economic, social, and environmental case for NBS for adaptation, which will take time and resources. As with many other sectors, MEL for NBS for adaptation is all too often an afterthought and not budgeted for. It is also often hindered by the short-term nature of donor funding, since NBS projects often require periods of more than 10 years to demonstrate appropriate impact, especially as this impact relates to adaptation and improved resilience over time of both ecosystems and vulnerable groups.

Interviewees highlighted a gap in objective and high-quality MEL for both NBS and adaptation, which presents an immediate opportunity for funders and initiatives. As the empirical evidence base for NBS for adaptation is strengthened over time, the empirical case for why it is a cost-effective way for countries, cities, and communities to meet their adaptation goals may be strengthened. More developed MEL efforts around NBS for adaptation could then capture impacts on improved resilience of human and natural systems, including benefits to marginalized groups.

Facilitate access to finance and flexible funding

To scale NBS for adaptation, initiatives can help accelerate access to finance for pilots and programs that incorporate adaptation dimensions. Interested funders of initiatives can help by recognizing the emerging opportunities from NBS and deploying more grant funding through flexible mechanisms, aimed at developing and supporting the entire ecosystem of adaptation stakeholders (governments, subnational entities, communities, businesses, and local actors), which will allow the needed expansion of proof-of-concept interventions, especially throughout the Global South.

Adaptation will not scale globally with grant funding alone, and initiatives are uniquely positioned to help their users tap into the wealth of available green finance both from the public and private spheres. Initiatives can provide capacity to their users to develop innovative financial mechanisms to access finance, including climate finance, and organize to create appropriate project standards to enable project aggregation and scaling of NBS for adaptation projects. Relatedly, initiatives can help connect financial institutions, corporations, and other interested buyers eagerly seeking to invest in natural capital projects via payment for ecosystem services, carbon and biodiversity uplift credits, and other mechanisms. By tapping into their technical expertise, harnessing unique partnerships, and convening the required constellation of finance and business communities, initiatives can help their participants unlock investment finance for adaptation interventions at scale.

### 6.3 Recommendation to Initiative Secretariats

Build the capacity of NBS initiatives to design and mainstream adaptation into their programs and activities, and to better communicate the benefits of NBS for adaptation

Initiative secretariats should engage with adaptation partners and practitioners to build their own technical knowledge of and capacity for NBS for adaptation. Adaptation practitioners have much knowledge to share on mainstreaming climate risk management and making the socioeconomic case on NBS for adaptation. This collaboration should also engage communications specialists who are best positioned to translate technical information on the benefits of NBS for adaptation for a range of audiences. In addition, initiatives are encouraged to invest in hiring and training climate adaptation staff who can serve both the initiatives and the initiatives' clients (governments, cities, and so on) and to consider broadening their mandates to include adaptation.

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## 7. CONCLUSION

NBS initiatives have many strengths and advantages that can help countries and communities advance climate adaptation outcomes, and they therefore could become an important part of the existing spectrum of adaptation solutions. These initiatives are strategically placed to build effective partnerships, channel technical capacity and resources, and share knowledge. Intentionally integrating decision-making and planning for climate risks into NBS enhances the resilience of both activities on the ground and initiatives' general objectives. The adaptation community is adept at mainstreaming NBS into its practice; the NBS community can learn to mainstream and leverage adaptation as well.

Leveraging the current political momentum that exists for adaptation and NBS, and tapping into different NBS initiatives' competitive advantages, presents a unique opportunity to accelerate scaling of NBS commitments for adaptation, greatly increasing their positive impact—especially for the vulnerable groups they both aim to protect.

## APPENDIX A: ADDITIONAL METHODOLOGY DETAILS

In addition to AFR100, Cities4Forests, and Initiative 20x20, in which WRI plays a role, the authors administered the research survey to a broader group of NBS-centered initiatives. NBS platforms represented a wide range of setups and hierarchies ranging from informal networks to registered NGOs to government-affiliated programs. The unifying thread was the centrality of NBS within their missions and activities.

We identified which external initiatives to focus on through desk research and suggestions from a group of WRI staff, including experts from WRI's climate resilience, forests, and cities teams, who have many years of experience collaborating with NBS initiatives and partners. The group identified a list of over 40 initiatives, with their respective missions, main activities, and contact information. Although a few initiatives do not explicitly focus on NBS (e.g., the NDC Partnership), they were included because WRI experts in the fields of restoration, forests, cities, and water confirmed that they strongly engage in NBS approaches. We sent the survey questionnaire to the 36 initiatives for which the research team found available contact information, and kept it open from June 1 to July 31, 2021. The survey was first piloted by a group of five people within WRI and then adjusted based on feedback to improve clarity and consistency.

### Survey: The Role of Nature-Based Solutions Initiatives in Climate Adaptation

We understand this platform/initiative was not created with the sole intention of addressing adaptation goals. However, many nature-based solutions initiatives have the potential to contribute to increased adaptation outcomes, even if they have not had adaptation as a primary objective, and are likely already implementing some of these activities. Greater alignment and integration between adaptation and NBS can help maximize resources and co-benefits, and it is for this reason that we hope to engage with you and the broader NBS community through this survey to identify concrete ways to leverage NBS-related initiatives for greater adaptation results. We hope that this will also benefit your work by creating a space for exchange and collaboration across initiatives and within the NBS community.

The following questions are designed to provide a better understanding of how different NBS-related initiatives may be contributing to adaptation efforts and how these efforts could be scaled up. Your answers will be used to gauge interest in climate adaptation from a variety of NBS-centered initiatives and understand what additional support is needed. We are also very interested in learning and sharing information about places that are already taking advantage of NBS and climate adaptation opportunities and how these can be expanded.

Individual responses will remain anonymous and information will be aggregated at the initiative level. We do ask that you provide your name and affiliation so that we can follow up, if needed, to understand how needs compare across initiatives.

Thank you for taking the time to answer this survey. Your answers are very helpful to us as we seek ways to identify NBS-adaptation opportunities and accelerate action.

#### Part I: General information

- Your first name
- Your last name
- Your email address
- The initiative you are answering for
  - Answer format: Choose from a drop-down list of all 36 NBS initiatives identified

#### Part II: General features and purpose of the initiative

1. What is the initiative doing really well? What are its biggest strengths?
  - Answer format: Open-ended response
2. What are the main challenges and obstacles that still need to be overcome?
  - Answer format: Open-ended response

#### Part III: Existing engagement on climate adaptation

1. What level of interest and demand for adaptation has there been from stakeholders in your initiative? Stakeholders include countries, cities, businesses, communities, and partner organizations, among others, that are participating in your initiative.
  - Answer format: Choose one of the following options
    - High: Many cities and countries are interested in climate adaptation
    - Somewhat: Some cities and countries are interested
    - Minimal: Have heard of only a couple of cities or countries bringing up adaptation
    - Not at all/this is not a priority: Adaptation is not part of conversations
2. In your opinion, what climate adaptation priorities (e.g., urban flooding, storms, heat stress, food security, water access) draw the most attention from participating stakeholders?
  - Answer format: Open-ended response

3. In your opinion, which stakeholders are frontrunners when it comes to integrating climate adaptation into their NBS projects, plans, and strategies?
  - Answer format: Open-ended response
4. From the following, which climate adaptation considerations are integrated into the initiative? Check all that apply.
  - Climate risks and adaptation are expressly included in the initiative's mission/objectives
  - We share information about climate adaptation with our members
  - We provide technical guidance and support on climate adaptation
  - We provide financial support for climate adaptation considerations
  - No, the initiative doesn't integrate adaptation
  - I'm not sure
  - Other: \_\_\_\_\_
5. What aspects of the initiative enable adaptation considerations to be incorporated? Check all that apply.
  - Provision of relevant data and information
  - Provision of specialized technical assistance/capacity
  - Greater awareness about the role of NBS for adaptation
  - Peer-to-peer learning and sharing
  - Relevant gatherings with NBS and adaptation stakeholders
  - Formation of strategic partnerships
  - Access to NBS finance
  - Other: \_\_\_\_\_
6. Can you share one positive example of an on-the-ground project/activity with adaptation components that the initiative supported, and explain what went well? Please leave your email address so we can follow up with you to learn more about this case.
  - Answer format: Open-ended response
7. Can you share one example of an on-the-ground project/activity with adaptation components that the initiative supported that did not go as well and explain why that was? Please leave your email address so we can follow up with you to learn more about this case.

#### Part IV: Future engagement on climate adaptation

1. In your opinion, what types of support or enabling environment could help spur more action around adaptation in NBS initiatives? Check all that apply.
  - Provision of relevant data and information
  - Provision of specialized technical assistance/capacity
  - Greater awareness about the role of NBS for adaptation
  - Peer-to-peer learning and sharing
  - Relevant gatherings with NBS and adaptation stakeholders
  - Formation of strategic partnerships
  - Access to NBS finance
  - Other: \_\_\_\_\_
2. What has been the role of the NBS initiatives/platforms in raising awareness and building momentum in NBS for adaptation?
3. What should be the role of NBS initiatives/platforms at large in the future?
4. Are you interested in engaging with similar NBS initiatives on how to leverage adaptation and findings from this project?
  - a. Yes
  - b. No

## APPENDIX B: SEMI-STRUCTURED INTERVIEW QUESTIONS

Interviewer notes: Provide a brief overview of the project and introductions for people on the call. If recording, request consent. Aim for 30–40 minutes.

1. Can you please share a brief overview of the initiative and your role in supporting it?
2. What is the initiative doing really well/what are its biggest strengths that help (or could help) members integrate climate adaptation? *[review specific survey response and ask for details]*
3. What are the areas the initiative/platform could improve on to better take advantage of adaptation opportunities through NBS? *[review specific survey response and ask for details]*
4. Can you tell us more about frontrunner country/city/situation X you noted in the survey as being successful in integrating NBS to address adaptation? What were the factors for success?
5. Providing relevant data and information to enable adaptation considerations was marked as very important by survey respondents. In your experience, what type of data and information is most useful for stakeholders?
  - Basic data on current and future climate
  - Detailed and localized data on climate risks and adaptation options
  - Technical knowledge and tools on how to incorporate adaptation into NBS activities
  - Guidance to understand adaptation and NBS linkages
  - Evidence of the effectiveness of adaptation actions
  - Making the business case for adaptation action in NBS projects
  - Success stories
  - Information and lessons learned from peer initiatives/cities/countries
  - Other: \_\_\_\_\_
6. Survey respondents noted that progress integrating climate risks and adaptation measures can be slow (e.g., coordination processes) or disrupted (e.g., by administration changes, turnover, COVID-19). What have you seen that can keep momentum going and climate adaptation on the agenda?
7. Access to funding: How has your initiative or stakeholders overcome funding barriers?
8. What role(s) do you believe that initiatives such as yours can play to help members take action on adaptation?
9. What other types of support are needed to spur more action around adaptation in NBS initiatives?
10. You answered “yes” to engaging with other NBS initiatives. What do you envision as the best ways to do X, Y, Z that you noted in the survey?
11. Is there anything else you’d like to share with us about this topic before we end the interview?

## APPENDIX C: BRIEF OVERVIEW OF NBS INITIATIVES

The profiles of the 16 NBS initiatives that responded to the survey are listed in Table C1.

Table C1 | **NBS Initiatives Surveyed**

BRIEF DESCRIPTION	NBS RELEVANCE
<p><b>AFR100</b></p> <p>The African Forest Landscape Restoration Initiative (AFR100) is a country-led effort to bring 100 million hectares of land in Africa into restoration by 2030. AFR100 contributes to the Bonn Challenge, the African Resilient Landscapes Initiative (ARLI), the African Union Agenda 2063, the Sustainable Development Goals, and other targets.<sup>a</sup></p>	<p>AFR100 promotes forest and landscape restoration as a nature-based solution among member countries in Africa. To do so, it convenes country leadership and supports efforts with technical assistance on a wide range of activities, including mapping restoration opportunities, securing further financing, and providing catalytic support for the implementation of restoration efforts on the ground.</p>
<p><b>C40 Cities Climate Leadership Group</b></p> <p>C40 Cities is a network of mayors representing 97 world-leading cities focused on mitigating climate change and driving urban action that reduces emissions; mitigates climate risks; and increases the health, well-being, and economic opportunities of urban residents.</p> <p>C40 supports cities in collaborating effectively; sharing knowledge; and driving meaningful, measurable, and sustainable action on climate change.<sup>b</sup></p>	<p>C40 works to scale up climate action in a number of sectors where NBS play a critical role including adaptation and water, food systems, and urban planning.</p>
<p><b>Cities4Forests</b></p> <p>Cities4Forests helps cities around the world connect with and invest in inner forests (such as city trees and urban parks), nearby forests (such as green corridors and watersheds), and faraway forests (such as tropical and boreal forests). The platform encourages cities to better conserve, manage, and restore these forests, as well as provide technical assistance to align local policy, share knowledge, and access peer-to-peer learning and communication activities to take climate action together.<sup>c</sup></p>	<p>Cities4Forests engages city officials to enhance the role of forests as a nature-based solution to improve air and water quality, climate resilience and biodiversity, and human health and well-being.</p>
<p><b>CitiesWithNature</b></p> <p>CitiesWithNature recognizes the importance of nature in and around cities, and aims to enhance nature's value by providing a shared platform through which 197 cities and partners can engage and connect toward the goals of their shared commitments for a more sustainable urban world.</p> <p>The initiative was formed by founding partners ICLEI – Local Governments for Sustainability, The Nature Conservancy, and International Union for Conservation of Nature, along with supporting bodies such as the Convention on Biological Diversity and other international partners.<sup>d</sup></p>	<p>CitiesWithNature directly supports cities in building their relationships with nature by providing a shared platform for cities and their partners to engage and connect on their vision of working toward more sustainable urban systems.</p>
<p><b>Conservation International's Green-Gray Community of Practice</b></p> <p>Since its creation in 2020, the Green-Gray Community of Practice has served as an international group working to innovate and pilot new green-gray approaches; expand science, engineering, and policy activity; increase awareness of green-gray infrastructure's applications across geographies and settings; and build a community to increase broad acceptance and use of these ideas and enable access to finance.</p> <p>The group aims to introduce green-gray infrastructure innovations that are emerging, but are not yet in common use by engineers and practitioners globally. Its focus is in innovating, piloting, learning, and reaching scale with green-gray techniques.<sup>e</sup></p>	<p>The Green-Gray Community of Practice is founded on the belief that a hybrid green-gray approach to infrastructure—one that combines “green” ecosystem conservation and restoration with “gray” conventional engineering—can generate more benefits and climate resilience for people and nature than either strategy applied alone.</p>
<p><b>The Food and Land Use Coalition</b></p> <p>The Food and Land Use Coalition (FOLU) is dedicated to the urgent need to transform the way we produce and consume food and use our land for people, nature, and climate.<sup>f</sup></p>	<p>FOLU explores better land use, including the role of various NBS, to simultaneously meet food demands, mitigate climate change, protect nature, and benefit people.</p>

Table C1 | **NBS Initiatives Surveyed (Cont.)**

BRIEF DESCRIPTION	NBS RELEVANCE
<p><b>FEBA – Friends of Ecosystem-based Adaptation</b></p> <p>Friends of Ecosystem-based Adaptation (FEBA) is a global collaborative network of 90+ agencies and organizations involved in Ecosystem-based Adaptation (EbA). Experts synthesize multistakeholder knowledge on EbA to share that knowledge, exchange best practices, enhance mutual learning, and generate new knowledge.<sup>9</sup></p>	<p>The working groups address the following topics: biodiversity; climate; health and NBS; NBS in humanitarian contexts; urban EbA; EbA in National Adaptation Plans (NAPs); EbA and the Sustainable Development Goals (SDGs); biodiversity; and climate change.</p>
<p><b>Global Facility for Disaster Reduction and Recovery</b></p> <p>The Global Facility for Disaster Reduction and Recovery (GFDRR) is a global partnership with over 400 local, national, regional, and international partners. It works to help developing countries better understand and reduce their vulnerability to natural hazards and climate change. The GFDRR is a grant-funding mechanism managed by the World Bank that supports disaster risk management projects worldwide.<sup>h</sup></p>	<p>Among a menu of approaches for enhancing resilience and recovery, GFDRR relies on NBS to boost resilience in cities and communities. It seeks to pair smart engineering with the power of nature for safety and resilience.</p>
<p><b>The Global Partnership on Forest and Landscape Restoration</b></p> <p>The Global Partnership on Forest and Landscape Restoration (GPFLR) is a proactive global network that unites governments, organizations, academic/research institutes, communities, and individuals under a common goal: to restore the world’s lost and degraded forests and their surrounding landscapes.</p> <p>Specifically, the GPFLR responds directly to the Bonn Challenge to restore 150 million hectares of deforested and degraded land by 2020 and 350 million hectares by 2030.</p> <p>The GPFLR was initiated in 2003 by a small consortium of like-minded organizations and is spearheaded by IUCN.<sup>i</sup></p>	<p>The GPFLR seeks to catalyze dynamic, voluntary action by sharing diverse experiences on restoration efforts that are delivering tangible benefits to both local communities and nature through a landscape approach, while fulfilling international commitments on forests.</p>
<p><b>Initiative 20x20</b></p> <p>Initiative 20x20 is a country-led effort seeking to change the dynamics of land degradation in Latin America and the Caribbean by beginning to protect and restore 50 million hectares of forest, farmland, pasture, and other landscapes by 2030. The initiative—launched formally at COP20 in Lima in 2014—supports the Bonn Challenge and the New York Declaration on Forests, global commitments to bring 350 million hectares of the world’s deforested and degraded land into restoration by 2030.</p> <p>Eighteen countries in Latin America and the Caribbean have committed to Initiative 20x20 and receive support from over 120 technical and financial partners.<sup>j</sup></p>	<p>Initiative 20x20 promotes restoring and safeguarding natural ecosystems as NBS seeking to contribute to climate, biodiversity, and social outcomes.</p>
<p><b>Latin American Water Funds Partnership</b></p> <p>The Latin American Water Funds Partnership emerged as a local response to the challenge of improving water security with a primary focus on watershed conservation.</p> <p>Over time, the partnership’s mission and scope of activities have transformed and expanded to contribute more broadly to the water security of Latin American cities.</p> <p>Water Funds are organizations that design and promote financial and governance mechanisms, engaging public, private, and civil society stakeholders to contribute to water security through solutions grounded on nature-based infrastructure and the sustainable management of watersheds.<sup>k</sup></p>	<p>The Latin American Water Funds Partnership recognizes that watershed conservation as a nature-based solution is crucial for water security in cities and for other stakeholders, and works to develop partnerships and provide technical assistance to help cities protect and conserve their watersheds.</p>
<p><b>Nature4Cities</b></p> <p>Nature4Cities raises awareness about NBS and fosters new collaborative models for NBS uptake by developing a knowledge and decision support initiative. It provides knowledge repositories; tools to assess benefits, co-benefits, and NBS project costs; and tools to manage stakeholders’ participation processes.<sup>l</sup></p>	<p>Nature4Cities supports European cities in creating, assessing, and implementing NBS projects through technical assistance and peer-to-peer knowledge exchange.</p>

Table C1 | **NBS Initiatives Surveyed (Cont.)**

BRIEF DESCRIPTION	NBS RELEVANCE
<p><b>Naturvation</b></p> <p>Naturvation stands for NATure-based URban innoVATION and is a four-year European Commission-funded project focused on the role of NBS in solving urban sustainability challenges in Europe.<sup>m</sup></p>	<p>Naturvation seeks to develop knowledge on what NBS can achieve in cities, examine how innovation can be fostered in this domain, and help realize the potential of NBS to respond to urban sustainability challenges.</p>
<p><b>NDC Partnership</b></p> <p>The NDC Partnership works directly with national governments, international institutions, civil society, researchers, and the private sector to fast-track climate and development action. The partnership aims to increase alignment, coordination, and access to resources to link needs to solutions through country engagement, knowledge and information sharing, and access to finance.<sup>n</sup></p>	<p>The partnership is positioned to support countries in advancing best practices within their climate action agendas that are captured in their nationally determined contributions (NDCs). Here, the NDC Partnership is well-positioned to enhance exposure to NBS as a climate action as countries submit calls for support.</p>
<p><b>PANORAMA – Solutions for a Healthy Planet</b></p> <p>This initiative documents and promotes examples of replicable solutions—including ecosystem-based approaches—across a range of conservation and sustainable development topics to enable cross-sectoral learning and inspiration.<sup>o</sup></p>	<p>PANORAMA engages on a number of thematic areas including marine and coastal ecosystem-based management; global protected areas; mainstreaming ecosystem-based adaptation; agriculture and biodiversity to design biodiversity-friendly agricultural practices; and business engagement on biodiversity conservation.</p>
<p><b>UrbanShift</b></p> <p>UrbanShift supports cities around the world in adopting integrated approaches to urban development, building a sustainable and inclusive future where both people and planet can thrive.<sup>p</sup></p>	<p>NBS are a key instrument of the Sustainable Cities Integrated Approach Pilot Program on which the UrbanShift initiative is built.</p>

*Notes:* <sup>a</sup> AFR100 n.d. <sup>b</sup> C40 Cities n.d. <sup>c</sup> Cities4Forests n.d. <sup>d</sup> CitiesWithNature n.d. <sup>e</sup> GGCP n.d. <sup>f</sup> FOLU n.d. <sup>g</sup> FEBA n.d. <sup>h</sup> GFDRR n.d. <sup>i</sup> GPFLR n.d. <sup>j</sup> Initiative 20x20 n.d. <sup>k</sup> LAWFP n.d. <sup>l</sup> Nature4Cities n.d. <sup>m</sup> Naturvation n.d. <sup>n</sup> NDC Partnership n.d. <sup>o</sup> PANORAMA n.d. <sup>p</sup> UrbanShift n.d.

## List of Additional Relevant NBS Initiatives Surveyed:

1. Capitals Coalition (<https://capitalscoalition.org/>)
2. Clever Cities (<https://clevercities.eu/>)
3. Connecting Nature (<https://connectingnature.eu/>)
4. Connecting Nature Enterprise Platform (<https://connectingnature.eu/cnep>)
5. ECCA30 (<https://infoflr.org/bonn-challenge/regional-initiatives/ecca30>)
6. Friends of Ocean Action (<https://www.weforum.org/friends-of-ocean-action>)
7. Interfaith Rainforest Initiative (<https://www.interfaithrainforest.org/>)
8. Natural Capital Project (<https://naturalcapitalproject.stanford.edu/>)
9. Natural Infrastructure for Business (<https://www.wbcsd.org/Programs/Food-and-Nature/Water/Natural-Infrastructure-for-Business>)
10. Nature4Climate (<https://nature4climate.org/>)
11. Nature-based Solutions Initiative, University of Oxford (<https://www.naturebasedsolutionsinitiative.org/>)
12. Partnership for Environment and Disaster Risk Reduction (<https://pedrr.org/>)
13. Resilient Cities Network (<https://resilientcitiesnetwork.org/>)
14. Rewilding Europe (<https://rewildingeurope.com/>)
15. The Nature of Cities (<https://www.thenatureofcities.com/>)
16. ThinkNature (<https://www.think-nature.eu/>)
17. Nature-based Solutions Coalition (<https://www.unep.org/nature-based-solutions-climate>)
18. UnaLab (<https://unalab.eu/en>)
19. UrbanByNature (<https://connectingnature.eu/urbanbynature>)
20. Wealth Accounting and the Valuation of Ecosystem Services (WAVES) (<https://www.wavespartnership.org/>)

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## ENDNOTES

1. For example, reforestation in a region that is not experiencing any negative effects of climate change is not an NBS for adaptation measure even if the forests are helping to sequester carbon as part of climate mitigation efforts. Similarly, establishing urban green areas in a city for people's enjoyment is not NBS for adaptation unless these green areas help reduce the effects of heat waves, rising temperatures, urban flooding, or other threats resulting from climate change. The climate risk must be present or projected, and the NBS activity must be expected to play a role in reducing this risk for it to be considered NBS for adaptation.
2. As part of the effort to reduce bias, authors also visualized results of only Cities4Forests and compared these results with a graph of the other initiatives. Since the top results remained the same or very similar when comparing this initiative with the rest, it seemed safe to proceed with allotting each initiative the same weight of "one point," or "one voice."
3. Learn more at Initiative 20x20's website: <https://initiative20x20.org/>
4. Find the latest Initiative 20x20 factsheet here: <https://initiative20x20.org/restoring-latin-americas-landscapes>.
5. Guatemala allocates a preset percentage of its yearly budget, and Costa Rica funds its payment for ecosystem services program through fuel taxes.
6. Learn more at Cities4Forests' website: <https://www.wri.org/our-work/project/cities4forests>.
7. Find the latest list of Cities4Forests member cities here: <https://www.wri.org/our-work/project/cities4forests>.

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## ABOUT THE NATURE-BASED SOLUTIONS INITIATIVES THAT WRI IS INVOLVED IN

Whilst this paper is a product of an independent project funded by the Gordon and Betty Moore Foundation, the research was conducted in partnership with three NBS initiatives in which WRI plays a convening role: AFR100, Cities4Forests and Initiative 20x20.

### AFR100

AFR100 is a country-led effort to bring 100 million hectares of land in Africa into restoration by 2030. It aims to accelerate forest and landscape restoration across Africa to enhance food security, increase climate change resilience and mitigation, and combat rural poverty. AFR100 is a partnership of 32 African governments and numerous technical and financial partners.



### Cities4Forests

Cities4Forests is a global network of more than 80 cities committed to conserving, restoring, and sustainably managing trees, forests, and other nature-based solutions for human well-being. Cities4Forests supports cities' efforts on their inner forests (such as urban parks and greenways), nearby forests (such as watersheds), and faraway forests (especially tropical forests) by raising awareness of the benefits of forests, inspiring political action and engagement, providing technical assistance, and facilitating economic analysis, finance, and investment.



### Initiative 20x20

Initiative 20x20 is a country-led effort that aims to change the dynamics of land degradation in Latin America and the Caribbean by protecting and restoring 50 million hectares of forests, farms, pasture, and other landscapes by 2030. Through Initiative 20x20, 18 Latin American and Caribbean countries and three regional programs have committed to protect and/or restore more than 52 million hectares of land. The initiative is supported by more than 85 technical organizations and institutions and a coalition of impact investors and funds.



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## ABOUT WRI

World Resources Institute is a global research organization that turns big ideas into action at the nexus of environment, economic opportunity, and human well-being.

### Our Challenge

Natural resources are at the foundation of economic opportunity and human wellbeing. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

### Our Vision

We envision an equitable and prosperous planet driven by the wise management of natural resources. We aspire to create a world where the actions of government, business, and communities combine to eliminate poverty and sustain the natural environment for all people.

### Our Approach

#### COUNT IT

We start with data. We conduct independent research and draw on the latest technology to develop new insights and recommendations. Our rigorous analysis identifies risks, unveils opportunities, and informs smart strategies. We focus our efforts on influential and emerging economies where the future of sustainability will be determined.

#### CHANGE IT

We use our research to influence government policies, business strategies, and civil society action. We test projects with communities, companies, and government agencies to build a strong evidence base. Then, we work with partners to deliver change on the ground that alleviates poverty and strengthens society. We hold ourselves accountable to ensure our outcomes will be bold and enduring.

#### SCALE IT

We don't think small. Once tested, we work with partners to adopt and expand our efforts regionally and globally. We engage with decision-makers to carry out our ideas and elevate our impact. We measure success through government and business actions that improve people's lives and sustain a healthy environment.



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