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WORKING PAPER

BUILDING COASTAL RESILIENCE IN BANGLADESH, THE PHILIPPINES, AND COLOMBIA: COUNTRY EXPERIENCES WITH MAINSTREAMING CLIMATE ADAPTATION

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EXECUTIVE SUMMARY

Highlights

- Coastal areas are generally highly vulnerable to climate change impacts, and the need to reduce risks and build resilience is great.
- While a growing number of countries are integrating, or mainstreaming, adaptation into coastal development plans, many struggle to implement proposed actions on the ground, leading to an implementation gap.
- This paper shares case studies from Bangladesh, the Philippines, and Colombia that illustrate successful national and subnational experiences with both planning *and* implementing adaptation measures to build coastal resilience and reduce the risk of disasters.
- The paper identifies a common set of factors that have contributed to these successes: having political will and champions to lead the process of mainstreaming adaptation and disaster risk reduction into policies and legislation; having access to credible climate information to inform resilience plans; coordinating across diverse stakeholders who form robust alliances; and allocating domestic funds combined with international funding.
- Challenges to adaptation action that the case studies highlight include a lack of interministerial coherence and coordination; fragmented information; competing priorities; and insufficient funding.

CONTENTS

Working Papers contain preliminary research, analysis, findings, and recommendations. They are circulated to stimulate timely discussion and critical feedback, and to influence ongoing debate on emerging issues. Working papers may eventually be published in another form and their content may be revised.

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- Recommendations include improving access to easily understandable climate information; supporting climate leaders; instituting laws and policies that mandate integration of adaptation throughout government; and having reliable structures to manage domestic and international funds.

Summary

More severe flooding and erosion, more intense storms, rising seas, increased salinization, and higher storm surges are some of the new realities around the world that make coastal areas particularly vulnerable to climate change impacts. The Intergovernmental Panel on Climate Change (IPCC) estimates that by 2050 more than 1 billion people will be living in low-lying coastal zones, at increased risk of sea level rise and cyclones, even in the most moderate emissions scenario (IPCC 2019).

The IPCC's special report *Global Warming of 1.5°C*, published in 2018, underlines the importance of preparing for more extreme weather events that are a consequence of climate change (IPCC 2018). As countries across the world work to become resilient to more variable and extreme weather events, they are facing challenges of how best to integrate, or mainstream, climate change-related information on risks, hazards, and vulnerabilities into development planning, and how to choose the best adaptation measures in response. Integrating adaptation into national and subnational disaster risk reduction (DRR) and coastal resilience strategies is therefore essential.

This paper examines case studies from three countries—Bangladesh, the Philippines, and Colombia—that are making progress on integrating climate adaptation into planning *and* implementing on-the-ground actions to build coastal resilience. The enabling factors and challenges shared by these locations can serve as models and inspiration to other countries that are grappling with similar issues as they work to narrow the "implementation gap" between planning and action.

About This Working Paper

WRI, with support from Germany's Federal Ministry for Economic Cooperation and Development, BMZ, as a contribution to the NDC Partnership, is seeking to provide guidance to NDC Partnership member countries facing mainstreaming challenges through a series of case studies—including this one—that provide specific, actionable examples of how countries are making progress on integrating climate risk and adaptation measures across sectors and geographies.

This paper is part of a series of case studies by World Resources Institute that applies a framework for successful mainstreaming (Mogelgaard et al. 2018) and identifies elements essential for success. The series includes the following:

- *From Planning to Action: Mainstreaming Adaptation into Development* (Mogelgaard et al. 2018), which conducted a global analysis to identify factors that enable mainstreaming and implementation of adaptation activities.
- *Mainstreaming Adaptation in Action: Case Studies from Two States in India* (Dinshaw et al. 2018), which examines mainstreaming at the state level in the livestock and forestry sectors.
- *Assessment of the Limits, Challenges, and Opportunities for Adaptation Mainstreaming in Brazilian Cities* (Speranza et al. 2018), an internal report to the government of Brazil focused on mainstreaming from the national to the city level and the challenges of implementation.
- Additional case studies on county-level adaptation action in Kenya and mainstreaming adaptation into the public health sector are in process.

Key Findings

- Despite facing various challenges, all three locations studied for this paper have made progress both in mainstreaming and implementing DRR and adaptation; some early benefits, including lives saved, are already apparent.
- A whole-of-government approach is essential to mainstreaming adaptation and closing the gap between planning and implementation.
- Credible, capable institutions dedicated to collecting objective, relevant, and easily accessible information are key in designing effective coastal resilience plans. These institutions identify and analyze climate risks to create comprehensive vulnerability assessments, which are the basis for the development of coastal resilience policies.
- Parliamentarians, members of other legislative bodies (e.g., municipal or city councils), and other leaders play an important role in building climate resilience. So do policies and/or legislation that mandate the integration of climate adaptation into development

planning processes—which is vital for accelerating the integration of climate adaptation into coastal resilience policies.

- The availability of funding from both domestic and international sources is essential for addressing the implementation gap.

Recommendations

- Promote a whole-of-government approach in which officials from all ministries and sectors, not only adaptation specialists, are engaged in addressing the key challenges of integrating climate adaptation into DRR policies and action plans.
- Enable national and international climate information providers to produce regularly updated, easily understandable information relating to risks, hazards, and vulnerabilities.
- Build the capacities of climate change leaders to understand and use relevant information and analysis supplied by climate data providers. With greater support, they can be more effective at mustering resources across sectors and raising awareness and funds to implement solutions for coastal resilience.
- Empower parliamentarians, members of other legislative bodies (e.g., municipal or city councils), and other leaders to play an important role by integrating climate risks and adaptation measures into legislative and policy processes.
- Ensure that capacities and structures are in place to manage domestic and international funds in line with an agreed-upon implementation plan. This will help ensure the best use of available funding at national and subnational levels of government.

1. INTRODUCTION

According to the IPCC's *Special Report on the Ocean and Cryosphere in a Changing Climate*, by 2050 more than 1 billion people will be living in low-lying coastal zones, at increased risk of sea level rise, storm surges, and cyclones, even in the most moderate emissions scenario (IPCC 2019). Action is urgently needed to reduce these and other climate change risks. Mainstreaming adaptation is one of the most promising approaches to accelerating this process.

Mainstreaming (also called integrating) adaptation into development policies, programs, plans, and projects to make them more climate resilient can also lead to improved development outcomes and

LIST OF ABBREVIATIONS

BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BCCTF	Bangladesh Climate Change Trust Fund
BMZ	Federal Ministry of Economic Cooperation and Development, German Government
CDMP	Bangladesh Comprehensive Disaster Management Programme
CDP	Comprehensive Development Plan (Philippines)
COP	Conference of the Parties
CSOs	civil society organizations
DRM	disaster risk management
DRR	disaster risk reduction
DRRM Act	Philippine Disaster Risk Reduction and Management Act of 2010
GCF	Green Climate Fund
INVEMAR	Institute for Marine and Coastal Research (Colombia)
IPCC	Intergovernmental Panel on Climate Change
LUP	Land Use Plan (Philippines)
NAP GN	National Adaptation Plan Global Network
NDC Partnership	Nationally Determined Contributions Partnership
NGO	nongovernmental organization
OECD	Organisation for Economic Co-operation and Development
PfR	Partners for Resilience
RSL	Request for Support Letter
UNFCCC	United Nations Framework Convention on Climate Change
UNGRD	National Disaster Risk Management Unit (Colombia)

protect development gains (Mogelgaard et al. 2018). Mainstreaming is the process of incorporating information on risks, hazards, and vulnerabilities into current development plans and decision-making (Gupta and van der Grijp 2010; Klein et al. 2003). Integrating adaptation into development planning can also pave the way for increases in financial flows from national government budgets and/or through external funding to implement adaptation and disaster risk reduction (DRR) activities (IIED 2008; Lebel et al. 2012). It can lead to "no regrets" opportunities to achieve development goals that are resilient to present and future climate impacts for the most vulnerable (Ayers and Huq 2009). Climate adaptation and DRR interventions to manage hazards are often intrinsically linked and complementary; a growing body of research illustrates the benefits of recognizing the coherence between these two fields (See Box 1 and OECD 2020).

An important constraint on the effectiveness of climate adaptation policies is the gap between planning and implementation, which must be addressed to better manage climate impacts and minimize vulnerabilities. Adaptation is now on the political agendas of most countries and over 120 countries have started National Adaptation Plan (NAP) processes to integrate adaptation into development and sectoral planning. However, only 32 have established institutional arrangements for integration, and just 34 have undertaken integration activities (Dupuis and Knoepfel 2013; UNFCCC 2019). A variety of factors contribute to this implementation gap: limited cooperation and coordination among stakeholders, along with a lack of political will and commitment, can prevent the implementation gap from being closed (Mogelgaard et al. 2018). Coordination must also occur both horizontally and vertically—that is, across sectors and ministries or departments, as well as from national to local levels—and with the involvement of civil society, especially for coastal areas that span administrative boundaries. This adds another layer of complexity to mainstreaming.

Mogelgaard et al. (2018) outline in *From Planning to Action: Mainstreaming Adaptation into Development* how five "gears," working together, can accelerate the closing of the implementation gap:

- Supportive policy frameworks, such as National Adaptation Plans, that mandate the integration of climate risks.
- Leadership from within and outside the government to drive the mainstreaming process.
- Robust and effective coordination mechanisms that allow actors to cooperate among sectors and governments and to attain common goals.
- Information and tools that enable learning.
- Finance to support these efforts.

Additional enabling factors that this paper explores also proved to be important in specific contexts: leadership from the private sector, living in urban areas, public momentum following catastrophes, and adaptation mandated through legislation.

This paper illustrates three planning-to-implementation stories: one at the national level, Bangladesh, and two at the subnational level, Malabon City in the Philippines and Cartagena in Colombia. These stories describe the enabling factors and challenges that these countries have faced in integrating and implementing adaptation in coastal DRR, as well as the concrete activities and some of the benefits that this integration has brought about. The paper continues with a discussion of lessons learned from the cases and a series of recommendations that could be helpful to other countries looking to bridge the implementation gap.

1.1 Purpose and Scope

This working paper aims to inspire, accelerate, and scale up integrated adaptation action at national and subnational levels. The three case studies show how governments, municipalities, business owners, and other stakeholders have organized themselves in coastal areas to address climate change–related risks. These actors have not only designed programs and plans but also "moved the needle" from planning to implementation on the ground.

The main audience for this paper is government officials—both at the national and subnational levels—responsible for formulating or increasing the ambition of nationally determined contributions (NDCs) under the United Nations Framework Convention on Climate Change (UNFCCC), and those charged with integrating adaptation into planning or implementing adaptation actions. In addition, organizations supporting the implementation of adaptation activities could use the country experiences mentioned as examples to inform their own work. This working paper may also be of use to private businesses, civil society organizations (CSOs), and groups most affected by climate impacts (including the poor and marginalized). The paper may also serve the needs of funding entities and donors seeking good practice examples to include in their guidelines.

2. METHODOLOGY

This paper is the product of an iterative process to better understand the perspectives and challenges faced by countries working to build resilience to climate change impacts. It began when WRI and the National Adaptation Plan Global Network (NAP GN) convened three Informal Dialogues on Adaptation: the first on the sidelines of the 24th Conference of the Parties (COP24) of the UNFCCC in December 2018, the second at the UNFCCC Bonn Intersessional in June 2019, and the third during the UNFCCC COP25 in December 2019. These informal dialogues and follow-up discussions revealed that governments understand well the importance of integrating climate adaptation into national development plans and sectoral policies, and often use National Adaptation Plan processes to focus such efforts. They are also aware that a variety of resources and initiatives exist to support their efforts. Nevertheless, most countries acknowledged that moving from adaptation planning to on-the-ground implementation continues to be a critical challenge.

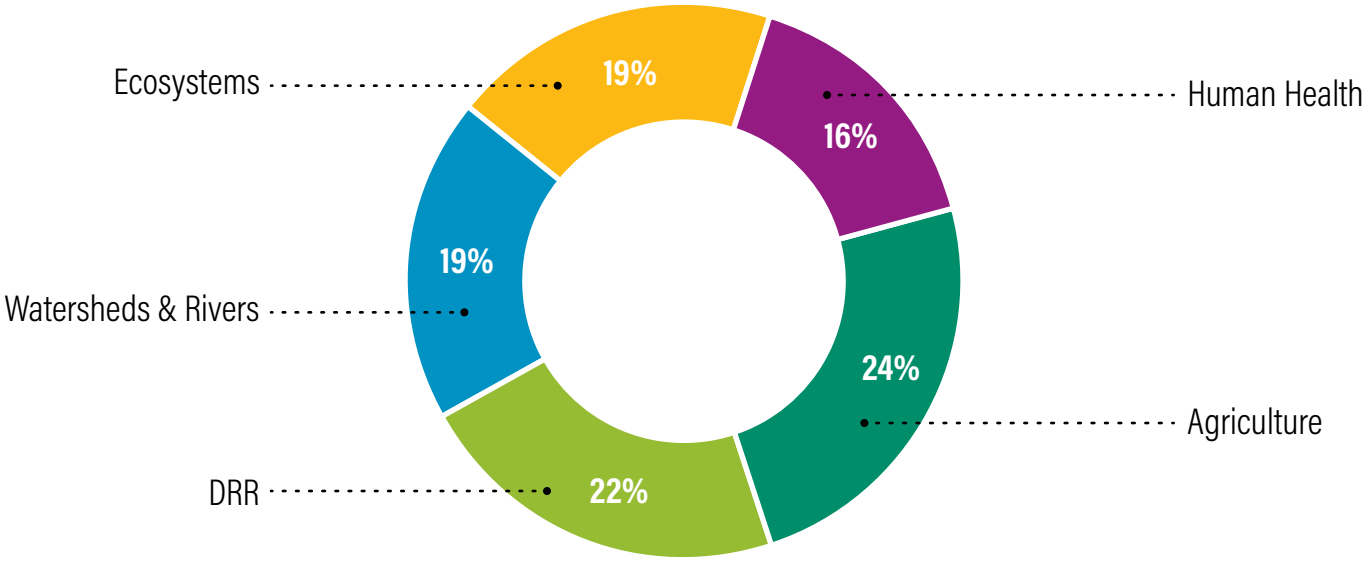
Mainstreaming adaptation was consistently raised during these dialogues as an important topic for NDC Partnership member countries, as further evidenced by the fact that it was included in 43 out of 73 NDCs from these countries (as of November 2019). Mainstreaming also appears frequently in countries' Request for Support Letters (RSLs) to the NDC Partnership, which then "matchmakes" country requests with knowledge institutions and implementing agencies that can provide the needed support.

Both Colombia and the Philippines submitted RSLs or otherwise applied for support to the NDC Partnership for mainstreaming adaptation through cross-sectoral, whole-of-government approaches. Colombia has also requested technical support under the NDC Partnership's Climate Action Enhancement Package (CAEP) to strengthen the climate resilience of its sectors and territories and increase the ambition of its Paris Agreement commitments in different economic sectors (Government of Colombia 2020). The findings in this paper could help fill some of the gaps discussed in countries' request letters. Colombia's letter, for example, outlines the need for technical assistance in "prevention and knowledge" to reduce climate risks and implement adaptation initiatives in the most vulnerable departments and municipalities (Government of Colombia 2018). The Philippines has asked for support in mainstreaming climate adaptation into the revision of its energy policy, the policy's implementation, and the policy's monitoring and evaluation cycle (Philippines Climate Change Commission 2018).

We took six steps to identify which topics related to mainstreaming adaptation were most relevant to NDC Partnership member countries, and to pinpoint countries whose experiences could be shared through this paper:

1. Keyword searches for adaptation activities described in "The GCF's Approach to Adaptation: Analysis and Implications for the Fund" (WRI 2018) were conducted to identify an initial set of 20 topics (e.g., agriculture, ecosystems, health).
2. Using the NDC Partnership Knowledge Portal, we examined the NDCs of all 73 NDC Partnership member countries in Africa, Asia, Latin America and the Caribbean, and the Pacific (submitted as of November 2019) to identify which topical keywords from the Green Climate Fund (GCF) categories related to adaptation mainstreaming were mentioned most frequently. The five topics that were mentioned most frequently (at least eight times) were agriculture (by 55 countries), DRR (52), watersheds and rivers (45), ecosystems (44), and human health (36) (see Figure 1).
3. We employed the NDC Partnership's internal "kNook" database to assess which NDC Partnership countries had requested mainstreaming adaptation support between 2016 and 2019 (i.e., since the founding of the NDC Partnership). We looked at documents like countries' letters requesting support and identified either countries' intentions to mainstream or the mainstreaming initiatives underway.
4. We researched articles and publications, including NAP GN resources and the NDC Partnership Good Practice Database, that illustrate how countries have narrowed or closed the implementation gap for the topics identified. A variety of examples were found; at least three countries had narrowed the implementation gap for DRR and human health, leading WRI to focus on these two areas in its mainstreaming case study series. (The paper on human health is expected to be published in fall 2020.)
5. NDC Partnership member countries Bangladesh, the Philippines, and Colombia were chosen as case studies because these three countries are part of the small group for which documented evidence of implementation was found, and they represent experiences from a least developed country

Figure 1 | **Most Frequent Mentions of Adaptation Mainstreaming by Topic in Nationally Determined Contributions (as of November 2019)**



Source: Authors, based on data from the NDC Partnership's internal kNook database.

(Bangladesh), a lower-middle-income country with many islands (the Philippines), and an upper-middle-income country (Colombia). All three of these countries' stories happened to center on coastal resilience, which further refined the focus of this paper.

6. The evidence for two of these countries, the Philippines and Colombia, was primarily at the subnational level, while the evidence from Bangladesh was at the national level. Including a mix of national and subnational case studies enabled us to explore key topics from a range of perspectives. This mix provides NDC Partnership member countries with more diverse examples of how to close the implementation gap. Our literature review also yielded an analysis of mainstreaming in several small-scale coastal communities, summarized in Box 2.

Once topics and locations were identified, we reviewed key planning documents, reports, government websites, and online articles (both academic and news sources) from the case study locations to gather evidence on adaptation integration and implementation. We also analyzed notes from the three Informal Dialogues on Adaptation to identify specific member country representatives to interview for this paper. In total, five in-depth interviews were conducted with key experts knowledgeable about mainstreaming adaptation and DRR in the three countries. The interviews were based on a semi-structured questionnaire designed to probe about the mainstreaming process and determine how the implementation gap had been narrowed or closed (see Appendix A for the full questionnaire). To more consistently identify the enabling factors and barriers that helped or hindered mainstreaming, questions were based on the five "gears" in Mogelgaard et al. (2018). The interview protocol permitted interviewees to identify other factors beyond the five gears.

A limitation of this methodology is the small sample size of interviewees, which did not include a full range of perspectives. To help fill this gap, the team shared the preliminary findings at the Organisation for Economic Co-operation and Development (OECD) Workshop on Strengthening Climate Resilience with participants in October 2019. This group, which included country representatives, funders, and research organizations, provided feedback on our initial findings.

This research was not able to fully evaluate whether the implementation of adaptation actions has actually built resilience or led to other outcomes; indeed, many countries have yet to finalize the monitoring and evaluation systems that will measure and evaluate

Box 1 | Differences and Overlaps between Disaster Risk Reduction and Adaptation

Disaster risk reduction (DRR) aims to prevent new and reduce existing disaster risk, as well as manage residual risk, all of which contribute to strengthening resilience and therefore to achieving sustainable development.[a] The application of DRR is carried out through disaster risk management (DRM), which helps prevent, reduce, and manage existing and new risks, thereby contributing to increased resilience.

Adaptation is an adjustment of natural or human systems due to actual or expected changes in the climate, with the aim of reducing harm or increasing benefits from the changes.[b] Adaptation to climate change goes beyond addressing immediate disasters to addressing secondary and long-term impacts such as sea level rise, desertification, and changes in water supplies. The United Nations Framework Convention on Climate Change reported in 2019 that 120 countries had launched National Adaptation Plan processes.

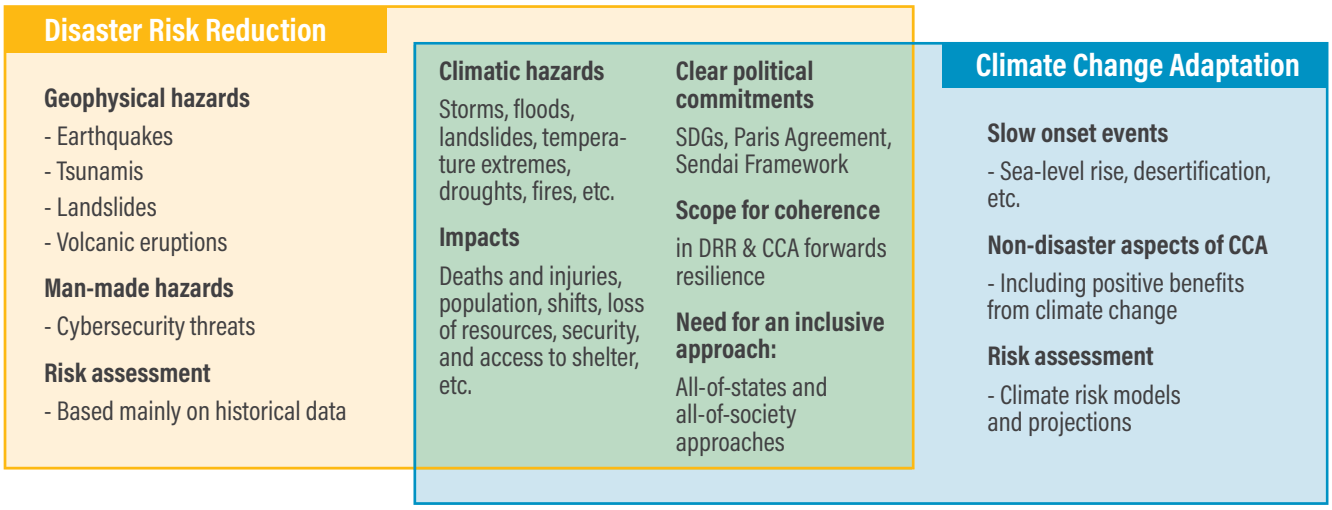
Although there are differences in approach, both DRR and adaptation focus on reducing people's and ecosystems' vulnerabilities to certain hazards and building resilience to them by applying policies and practices that support anticipation, coping, and recovery from the impacts of hazards.[c] The Intergovernmental Panel on Climate Change (IPCC) published a report in 2012 that brought together the concepts, data, and experiences of DRR and adaptation experts.[d] This special report of the IPCC explores the social and physical dimensions of weather- and climate-related disasters, considering opportunities for managing risks at local to international scales. This report was the basis for further research on the way in which climate risk is defined.

While the short-term reduction of risks due to weather extremes is a substantial component of managing climate risk and part of the overlap between DRR and adaptation (see Figure B1), DRR does not equal adaptation, and effective disaster risk management in a changing climate is more than business as usual.[e] Disaster risk reduction has increasingly come to involve longer-term planning,[f] which opens up the opportunity to better integrate it with climate change adaptation.

Closely connecting DRR and adaptation approaches can improve the odds of reducing losses due to climate change, and more efficiently use finances, human resources, and natural resources.[g]

A recent report from the Organisation for Economic Co-operation and Development (OECD) confirms that many governments recognize the benefits of greater coherence between adaptation and DRR, and several have engaged in formulating a joint strategy or have strengthened coordination between both policy areas.[h] The conceptual approach, as outlined in Figure B1, is based on the recent OECD report.

FIGURE B1: OVERLAP AND DIFFERENCES BETWEEN DRR AND CLIMATE CHANGE ADAPTATION



Notes: a. UN General Assembly 2016. b. IPCC 2014. c. Venton and La Trobe 2008. d. IPCC 2012. e. Mitchell et al. 2008. f. Venton and La Trobe 2008. g. Venton and La Trobe 2008. h. OECD 2020.
Source: Adapted from OECD 2020, which adopted it from Coninx, I., R. Swart, R. Schwarze, and G. Michalek. 2016. "PLACARD Evolving Issues Brief 2016." Brussels, Belgium: PLACARD Project.

results. Interviewees' impressions of outcomes were explored during interviews, and their thoughts on early indications of the benefits of adaptation interventions such as avoided damage or casualties during disasters are included. However, it was not feasible to more rigorously appraise the effectiveness of projects or implementation strategies, many of which are too recent to have been tested by extreme weather events or to be thoroughly evaluated, since outcomes and impacts of actions may take time to materialize. In addition, due to time and resource limitations, this paper also did not look into counterfactual cases where adaptation actions have not been implemented.

3. EXPERIENCES WITH MAINSTREAMING ADAPTATION IN BANGLADESH, THE PHILIPPINES, AND COLOMBIA

This section demonstrates how the nation of Bangladesh, Malabon City in the Philippines, and the city of Cartagena in Colombia have integrated both DRR and adaptation into their coastal development planning. Each section starts by describing the main climate impacts faced by the country or city and the adaptation actions it has identified in response. This is followed by a discussion of the benefits from adaptation measures that the country is experiencing. Each section then dives deeper into the enabling factors that allowed appropriate disaster risk reduction and adaptation measures to be integrated into national and subnational coastal resilience planning. The sections end by identifying the specific challenges of mainstreaming DRR and adaptation to build coastal resilience in each location.

3.1 Bangladesh

3.1.1 Climate change in coastal Bangladesh and effects of adaptation action

Bangladesh is one of the most climate vulnerable countries in the world. It ranks seventh out of 180 countries in the Global Climate Risk Index for the period 1999–2018 (Eckstein et al. 2020).[1] Between 1998 and 2017, Bangladesh faced 190 extreme weather events and floods, many of which were likely made more severe by climate change. Bangladesh is a low-lying delta, which is formed by the Ganges, Brahmaputra, and Meghna Rivers; the country counts more than 310 rivers and tributaries (ADRC n.d.). The country's 700 kilometer (km) long, low-lying coastline is highly exposed to deadly cyclones, which may become more frequent and/or severe as climate change advances. Nevertheless, during the past 20 years, Bangladesh has managed to dramatically reduce the number of casualties from cyclones. For example, in 2007, Cyclone Sidr—a Category 4 extreme storm—hit western Bangladesh and caused a reported 3,363 deaths (with thousands more suspected). A decade later, in 2017, Cyclone Fani—also a Category 4—hit the same region but led to five casualties and less extensive physical damage (GCA 2019).

In the past decades, the government of Bangladesh has integrated climate change adaptation into coastal resilience planning by focusing on DRR and then taking specific on-the-ground actions to implement it. Authorities have integrated the DRR approach in the planning process, provided early warnings for when cyclones are expected to make landfall, and established shelters that can also provide post-disaster relief (Haque et al. 2012). The government enhanced the early warning system in advance of Cyclone Sidr; after the storm had passed, it ordered the construction of 2,000 evacuation shelters to complement the 1,500 that already existed (Haque et al. 2012). Longer-term adaptation measures involved restoring approximately 195,000 hectares of severely degraded mangroves to reduce erosion, storm surge, and sea level rise—a program that started in 1966 and was accelerated recently (Government of Bangladesh 2015). An estimated 35,000 people in 62 villages are expected to benefit directly or indirectly (UNDP 2018).

As the capital and largest city, Dhaka receives support from the nationwide Comprehensive Disaster Management Programme, which has developed contingency plans and is promoting DRR capacity building via training programs and the development of urban disaster volunteer teams (Scott and Nadiruzzaman 2014). The World Bank's Urban Resilience Project also supported training, research, and the purchase of equipment to enhance city authorities' ability to respond to extreme weather events, along with the improvement of building codes to strengthen climate resilience (World Bank 2018).

Figure 2 provides a snapshot of the country's key policies and plans, political leadership involved in climate adaptation, and primary funding mechanisms.

Figure 2 | **Policy Landscape for Integrating Climate Adaptation in Bangladesh's Coastal Resilience**

Integration into policies and plans

Key Policies:

- Climate fiscal framework
- Vision 2021
- National Perspective Plan
- Annual Development Programme

Sectoral Plans:

- Water sector
- Coastal zone disaster risk reduction

Political leadership

- Climate Change Steering Committees
- Planning Commission
- Prime minister and ruling party, Awami League
- All-Party Parliamentary Group on Climate Change and Disaster Risk Reduction
- Climate Change Cells
- Climate Change Unit

Funding mechanisms in place

- Bangladesh Climate Change Trust Fund
- Bangladesh Climate Change Resilience Fund

Source: Authors.

3.1.2 Enabling factors in closing the gap between planning and implementation

Support for adaptation is integrated throughout key development policies and plans: In addition to its adaptation-specific Climate Change Strategy and Action Plan (BCCSAP), Bangladesh has also integrated adaptation more broadly into development planning (Ayers et al. 2014) and other policies. Adaptation is integrated into economic development plans, such as Vision 2021 (launched in 2008) and the Perspective Plan of Bangladesh, which sets development targets up to 2021. Bangladesh's sixth Five-Year Plan also includes climate change as a key topic. The national Planning Commission integrated climate change into the Annual Development Programme and internalized climate change into medium- and long-term planning processes in four sectors: agriculture, transport, rural development, and water (Rai et al. 2014). Programs with a climate adaptation dimension represent 20 to 25 percent of the government's expenditures (Pervin 2013).

Climate change adaptation has also been integrated into coastal zone disaster preparedness plans and the 25-year water sector plan. Likewise, the Disaster Management Act of 2012 includes references to climate change. Sections on adaptation in Bangladesh's NDC signal its political commitment by outlining the need for both DRR and adaptation to take place together to provide immediate relief from the impacts of cyclones while implementing long-term solutions, such as planting mangroves.

Political support for and leadership on adaptation is sustained and persistent: Leaders consistently express strong resolve regarding the importance of adapting to climate change, including in combination with DRR policies. Furthermore, the government has established climate change steering committees to incorporate climate adaptation into national-level planning. It is also facilitating access to climate-relevant project funds and has mandated that any project submitted to the Planning Commission be checked for alignment with climate change issues (Pervin 2013).

Leadership on adaptation issues has been demonstrated by many politicians and officials, including the prime minister and the ruling party, Awami League, which made climate change an environmental and development priority in its election manifesto (Pervin 2013). The prime minister reviews actions under BCCSAP through a Cabinet Review Committee in the Ministry of Planning (Ayers et al. 2014). An All-Party Parliamentary Group on Climate

Change and Disaster Risk Reduction was established in 2009. This group consists of 120 members of parliament and represents all political parties, which work together to address climate change. A parliamentary committee for ministers of coastal regions was also formed in 2009.

Mechanisms are in place to facilitate coordination across sectors: The government of Bangladesh set up Climate Change Cells within each ministry to mainstream climate adaptation policies across all sectors. The Ministry of Environment, Forests, and Climate Change established a Climate Change Unit to coordinate across all cells and build capacity to integrate adaptation and DRR across ministries. This has led eight key ministries to include DRR and adaptation in their work plans (Rai et al. 2014). Additionally, through both the Ministry of Disaster Management and Relief and the National Disaster Management Council, which is led by the prime minister, Bangladesh has coordinated mainstreaming of DRR into 12 line ministries, 40 district Disaster Management Committees, and a network of over 2,000 village disaster committees (Khan 2017).

Decision-makers can access relevant information and tools: A national, cross-institutional capacity building and knowledge management program has been established to expand the capacities of national-level actors to access and use climate information and tools for adaptation and DRR decision-making. This initiative also aims to inform and influence policies on climate issues (Ayers et al. 2014). The program—the Comprehensive Disaster Management Programme (CDMP), functional from 2004–14 (UNDP n.d.)—was partly the result of international engagement with Bangladesh on climate issues. The CDMP included extensive national research, supported by international experts, which in turn generated substantial data and information. Another benefit of the international support was the important boost that the Bangladeshi government, together with a strong civil society, academic networks, and international support, gave to national training on adaptation and DRR.

National finances are allocated for implementation: Because climate change adaptation is a priority in Bangladesh, the country has established domestic funding mechanisms to implement adaptation (and DRR) action (Ayers et al. 2014). The Bangladesh Climate Change Trust Fund (BCCTF), funded by the government of Bangladesh, and the Bangladesh Climate Change Resilience Fund, co-funded by the government and donors, have provided significant financial support to accelerate implementation. During the last decade, Bangladesh has spent more than $1.5 billion of its own resources, particularly for adaptation activities, of which almost $500 million, or one-third of all funding, came from the BCCTF. A significant part of the funds is going into building multipurpose cyclone shelters and early warning systems in coastal areas as part of DRR, and into adaptation programs related to agriculture and mangrove restoration in coastal areas (Rai et al. 2014). The Ministry of Finance developed a "climate fiscal framework" in 2014 to integrate climate change into its budget planning and monitoring cycle. Bangladesh has issued an annual climate budget report since fiscal year (FY) 2017–18. The report currently covers 20 ministries and divisions (FY 2019–2020).

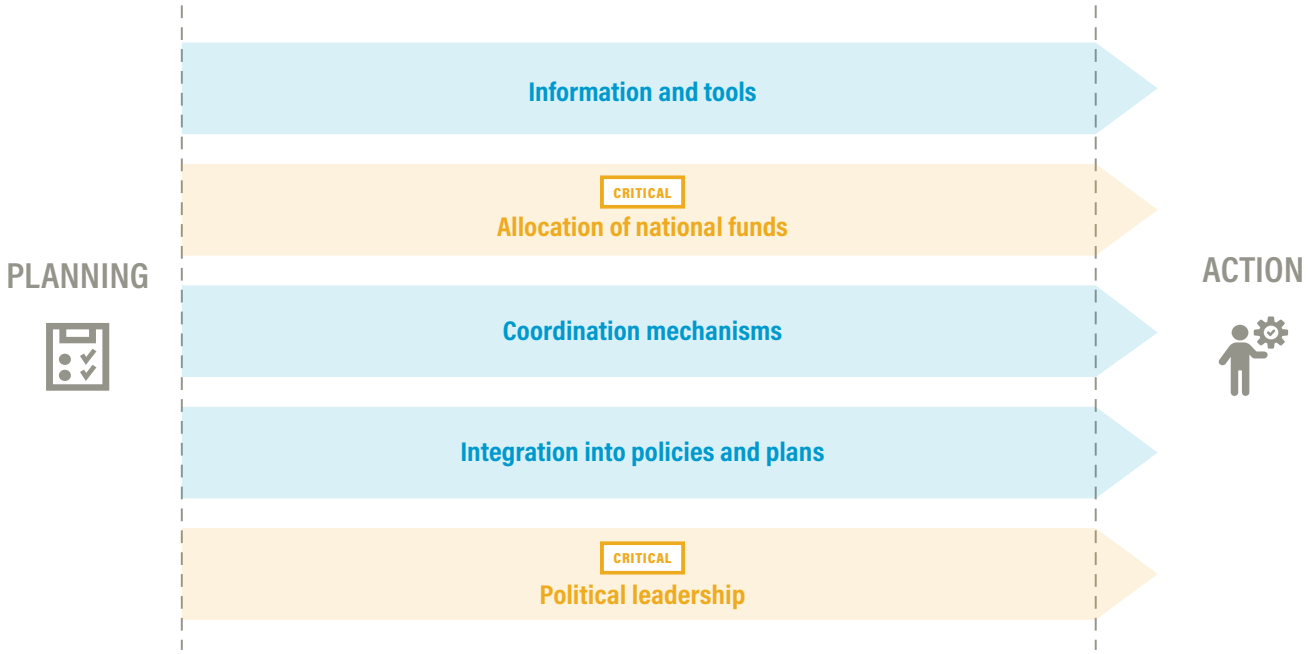
Figure 3 shows the main enabling factors that emerged in Bangladesh to help close the gap between planning and action.

3.1.3 Challenges to mainstreaming

Although Bangladesh has made significant strides in reducing climate risk, as demonstrated by the dramatic reduction in casualties from cyclones Sidr to Fani, several barriers still exist that slow down the process of mainstreaming and implementing all the country's necessary adaptation measures (Ayers et al. 2014). Despite the strong political will, political instability at times has slowed the process of mainstreaming. Even though Climate Change Cells and the Climate Change Unit have been established, there are still coordination issues across ministries due to the Ministry of Environment, Forests, and Climate Change's limited coordination capacity, loss of institutional memory as people take up other jobs and roles, and difficulties related to strengthening synergies between plans and programs (Pervin 2013). This is partly due to the conclusion of the donor-funded CDMP, and partially caused by general constraints on human resources capacity given Bangladesh's overall development status. In addition, despite the mandates to mainstream adaptation, only a few lead ministries receive funding, which suggests that mainstreaming is being done selectively and not all ministries benefit from it (Rai et al. 2014).

Some adaptation projects have been slow to be implemented due to interrupted financial flows from the climate funds. Government has held up funds for projects that fail to demonstrate adequate monitoring, often due to capacity constraints, management issues, and sometimes questions regarding integrity. Another factor that

Figure 3 | **Closing the Adaptation Planning and Implementation Gap in Bangladesh**



Note: Mogelgaard et al. (2018) outline in *From Planning to Action: Mainstreaming Adaptation into Development* how different "gears," working together, can accelerate the closing of the implementation gap. The weight of each gear as well as the presence of each element may differ in each country context. Our assessment is that political leadership and the allocation of national funds have been critical in moving from planning to action on the ground in Bangladesh.

Source: Authors.

influences financial flows relates to the lack of safeguards to ensure the engagement of affected and vulnerable groups such as poor and marginalized communities, including women, children, Indigenous peoples, and disabled citizens. Such delays affect procurement, disbursement, and hiring of staff.

Another concern relates to reduced access to international adaptation funds, which may arise when Bangladesh graduates out of the "Least Developed Country" status, projected to happen in 2024 (World Bank 2019). This welcome recognition of economic development has the downside of less access to grants and concessional loans that have supported Bangladesh's fight against climate change thus far (Khan 2017). Bangladesh will have to find ways to mobilize and use its own budget more effectively and to engage other private and public financial players if it is to continue to integrate adaptation into national, sectoral, and local development plans for coastal resilience and implement adaptation activities to protect its coast.

3.2 Malabon City, the Philippines

3.2.1 Climate change in Malabon City, the Philippines, and effects of adaptation action

The Philippines has historically faced recurrent weather-related catastrophes, and climate change is further aggravating these risks. It ranks fourth out of 180 countries in the Global Climate Risk Index for the period 1999–2018 (Eckstein et al. 2020). Between 1998 and 2017, the Philippines experienced 307 extreme weather events, which included cyclones and floods—some of which were likely made more severe by climate change. Located in the most cyclone-prone region of the world, seven to eight cyclones on average make landfall each year. One of the most devastating was Typhoon Haiyan in 2013, which killed over 7,360 people and damaged or destroyed more than 1.1 million homes (Aljibe 2018). Sea levels are also rising faster than the global average, and increasing rainfall and temperatures exacerbate climate risks even further (USAID 2017). As reflected in the country's letter of support to the NDC Partnership, it is a priority of

Figure 4 | **Policy Landscape for Integrating Climate Adaptation in the Philippines' Coastal Resilience**

Key policies and plans

- Disaster Risk Reduction and Management Act of 2010, Sendai Framework, and others mandate the creation of offices from the national to the local level, including *barangay*-level committees
- Comprehensive Development Plan
- Land Use Plans

Political leadership

- The Malabon City local government sought support to integrate risks
- Local officials and community leaders were fully engaged with a variety of community groups
- Development of strong partnerships

Funding mechanisms in place

- Local Disaster Risk Reduction and Management Funds
- Land Use Plans must allocate at least 5% of their revenue to disaster risk reduction and adaptation plans

Source: Authors.

the national government to increase the capacity and awareness of key institutions to deliver climate actions, which it aims to do by integrating and implementing mitigation and adaptation measures (Climate Change Commission 2018).

Malabon City, a part of Metro Manila, is highly prone to flooding, which is worsened by land subsidence due to high levels of groundwater extraction. It sits in an estuary of several rivers and near the coastline of Manila Bay. This densely populated city experiences flooding from rivers that overflow with intense rain and coastal flooding that occurs with high tides.

Fortunately, Malabon City has improved its climate resilience by integrating climate adaptation into urban planning through an integrated risk management approach that combines DRR, Climate Change Adaptation (CCA), and ecosystem management and restoration (EMR) to protect livelihoods and strengthen vulnerable communities.

This approach was designed and has been implemented by Partners for Resilience (PfR) since 2011. Formed by several international nongovernmental organizations (NGOs) and 30 civil society organizations in the global South, PfR works to strengthen community resilience against human and natural hazards.[2] It is focused on building the capacities of civil society partners and other key stakeholders of the Integrated Risk Management framework. This approach has led Malabon City to plant trees along riverbanks and in watersheds to reduce erosion and control flooding. The city has also established early warning systems based on a house-to-house information dissemination system to alert residents of imminent disasters (PfR 2014).

Figure 4 outlines the city's key policies and plans, political leadership involved in climate adaptation, and primary funding mechanisms.

3.2.2 Enabling factors in closing the gap between planning and implementation

Mainstreaming adaptation through legislation: The Philippine Disaster Risk Reduction and Management Act of 2010 (DRRM Act) has shifted the country's approach from merely responding to disasters to more proactively managing them. In line with the Sendai Framework,[3] the DRRM Act focuses on addressing the root causes of disaster risks and links explicitly to climate change adaptation. It mandates the creation of DRRM

offices in every province, city, and municipality, and of DRRM committees at the *barangay* (city quarter) level. Furthermore, similar to the Strategic Framework on DRR, the DRRM Act—as well as other relevant policies—requires Local Government Units (LGUs) to develop their own DRR and adaptation plans; in response, Malabon City integrated DRR and adaptation into its Comprehensive Development Plan (CDP) and Land Use Plan (LUP).

Financial resources allocated for implementation: The paradigm shift in the DRRM Act has helped mainstream adaptation into local development plans and allowed the Local Disaster Risk Reduction and Management (LDRRM) Funds, formerly known as Calamity Funds, to be used to support risk management activities. It provides an important example of how municipalities and communities can benefit from national legislation and national-level support. The DRRM Act decrees that LGUs must allocate at least 5 percent of their estimated revenue from regular resources to their DRR and adaptation plans. Of this amount, 30 percent is set aside for a quick response fund for relief and recovery, leaving 70 percent of these funds available for pre-disaster measures. This has stimulated concrete DRR and climate adaptation action, such as the procurement of early warning systems and equipment (Balala 2019). Malabon City used the financial resources of the LDRRM in 2014 for this purpose (City of Malabon Government 2014).

Information and tools for planning and integration: The local government of Malabon City needed support in integrating adaptation (and DRR) into its CDP and LUP. The city's main concerns were twofold: the technical capacity for policy planning and development was at a basic level, and the national policy guidance was not always coherent and therefore difficult to apply at the local level.

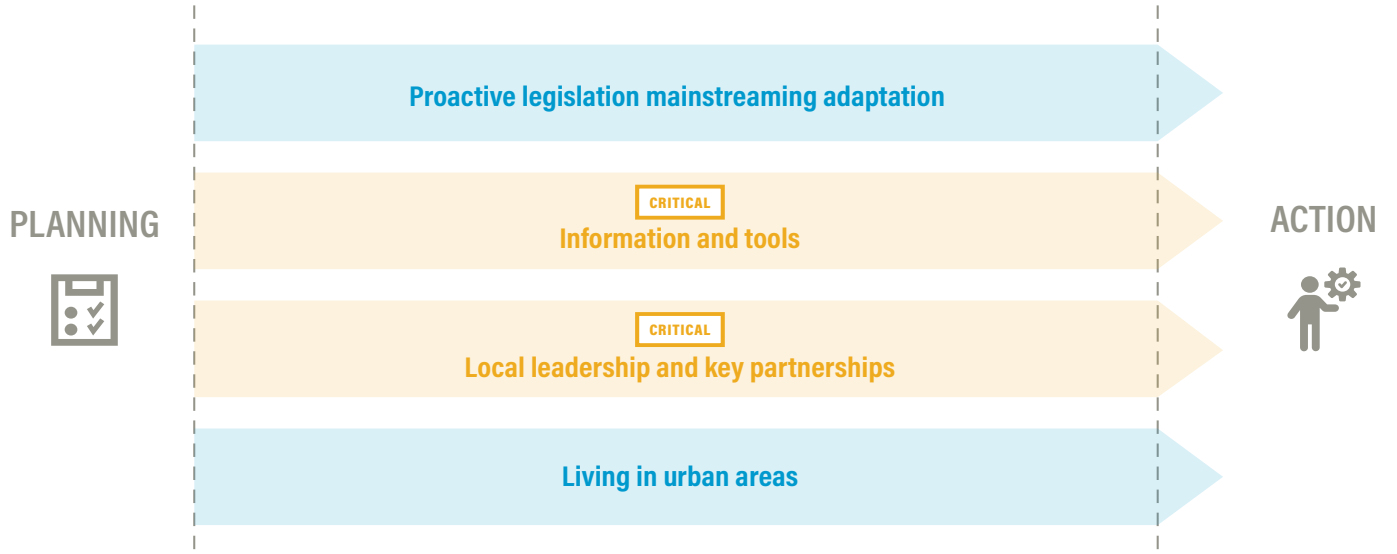
In response, PfR, which was already well-known in Malabon City thanks to the networks it had established over several years, stepped up to help the authorities build awareness of climate risks. It initially focused on the Barangay Potrero area of Malabon City—one of the most flood-prone neighborhoods—to identify what could be done to minimize risks. People here relied on information about climate risks that was provided in partnership with the Philippines Atmospheric, Geophysical, and Astronomical Services Administration. Flood risk maps were printed on large tarpaulins and posted in various parts of the *barangays* as a daily reminder of the need for action to reduce risks (Arcilla 2015). Local officials were trained in community-based DRM and received information on how to connect DRR with ecosystem-based adaptation measures, such as restoring trees along riverbanks.

This enabled communities to use risk assessment tools for adaptation and ecosystem management to identify hazards, at-risk areas, and "no-regrets" actions, which led them to develop a DRR evacuation plan. They restored riverbanks by planting trees through programs like the two-year Plant for Life: Malabon Tree-Growing Project, started in 2018, which aims to plant 50,000 mangrove trees (City of Malabon Government 2018). This activity is part of a larger strategic effort to plant a million trees per year in six critically degraded watersheds (Plant for Life 2018).

Leadership and partnerships: Local government and community leaders played a significant role in integrating adaptation into Barangay Potrero urban plans. They were fully engaged in capacity building and finding solutions to the river and coastal flooding issues. They met repeatedly with the community to encourage *barangay* members to actively take part in planning and incorporating adaptation (and DRR) measures into local planning. Leaders developed strong partnerships with a range of key stakeholders to implement the climate resilient urban plan (Arcilla 2015). Partnerships among Indigenous communities, people's organizations, civil society organizations, members of PfR, Barangay Potrero council and committees, national government, line agencies, and local government units within the same river basin contributed to implementing adaptation and DRR activities.

Living in urban areas: According to the key informants from PfR, residents of Potrero Barangay may have advantages from living in urban areas that have led them to successfully integrate DRR and adaptation into their local urban plans (Arcilla 2015). First, they have greater access to multiple news sources and thus a wider range of information about flooding, which rural areas and islands may not have. This allows them to compare their situation with other *barangays* nearby and enables them to demand more from their leaders to become climate resilient. Second, these informants believe that since the offices of international donors are located within or just outside these neighborhoods, residents of Barangay Potrero can readily access funds to implement their climate resilient urban plans.

Figure 5 | **Closing the Adaptation Planning and Implementation Gap in Malabon City**



Note: Mogelgaard et al. (2018) outline in *From Planning to Action: Mainstreaming Adaptation into Development* how five "gears," working together, can accelerate the closing of the implementation gap. The weight of each gear as well as the presence of each element may differ in each country context. Our assessment is that information and tools as well as local leadership and key partnerships have been critical in moving from planning to action on the ground in Malabon City.

Source: Authors.

Figure 5 highlights the main enabling factors that emerged in Malabon City to help close the gap between planning and action.

3.2.3 Challenges in mainstreaming

Integrating ecosystem approaches to climate risk management in development and land use plans remains a challenge, in part because ecosystems cut across local administrative boundaries such as those of *barangays* and cities. This requires local governments and other key stakeholders to join forces to implement ecosystem-wide measures, such as planting mangroves along the coast or restoring watersheds. PfR considers the imperative for this integration an asset because it requires collaboration among key stakeholders from within the landscape/river basin, including multiple local governments, which end up with stronger capacities and greater motivation to build shared strategies to benefit their ecosystem.

Collaboration among key stakeholders could be strengthened once the Philippines completes its National Adaptation Plan (NAP), which is intended to advance implementation of the country's National Climate Change Action Plan for 2011–28. The NAP may call for ecosystem-based adaptation to be used to protect urban coastal areas, such as Malabon City, and may hold the key to drive the integration of adaptation and DRR at the local level. The creation of one integrated policy framework, which combines disaster risk reduction and climate action—for example, by integrating the Disaster Risk Reduction and Management Plan and the Local Climate Change Action Plan—would facilitate consistency and an early uptake of policy guidelines at the local level. A new OECD report similarly notes how the Philippines' numerous parallel strategies, plans, and tools have slowed implementation nationally (OECD 2020).

Mainstreaming issues could also be addressed directly through the National Climate Change Action Plan, which is currently being revised and will form the basis of the NAP. New priorities are expected to be reflected in relevant regulations and strategies and to fully integrate climate adaptation and DRR into the nation's programs and plans at all levels (FAO and UNDP 2018). Another challenge that remains to mainstreaming and implementing adaptation is promoting buy-in from the local government to purchase climate risk insurance so that the financial and economic damage from new catastrophes can be addressed quickly.

3.3 Colombia, City of Cartagena

3.3.1 Climate change in Cartagena, Colombia, and effects of adaptation action

Colombia ranks 44th out of 181 countries in the latest Global Climate Risk Index for the period 1999–2018 (Eckstein et al. 2020). Colombia's NDC includes integrating climate change into priority sectors by 2030 as one of its 10 goals (NDC Partnership 2018). Cartagena, a city and port district in northern Colombia's Caribbean coast, is made up of a series of islands, peninsulas, and interior bodies of water. About 33 percent of Cartagena's inhabitants live in poverty. Cartagena suffers from flooding due to coastal erosion and La Niña events, extreme rainfall, and high tides. Highly vulnerable to climate change is the port sector, which includes 60 percent of the country's maritime trade, coastal city neighborhoods, and the Historic Center (Cartagena de Indias Municipal Government 2014).

New climate projections indicate that with a 2°C global temperature increase, by 2040 rainfall frequency and intensity in Colombia will have increased by 30 percent, and average land temperature will have risen from 27.1°C in 2010 to 29.1°C (INVEMAR et al. 2012). For these reasons, in 2015 Cartagena launched Plan 4C: A Competitive and Climate Compatible Cartagena, outlining a 2040 vision for a model urban and coastal city. Among the five main strategies in Plan 4C, four are relevant to our research: a climate compatible port; adaptation measures for the industrial sector; rethinking the city's inland and coastal areas, channels, and marshes; and adapting vulnerable neighborhoods to the effects of climate change.

Although several adaptation interventions in the plan are in the early stages of implementation, progress on other implementation activities has lagged due to a lack of funding (Plan 4C does not have the power to define public budgets). Funding for one large project has been secured to help strengthen Cartagena's coast by building 10 levees, a rainwater drainage system, and three breakwaters (as well as rehabilitating two existing ones) (UNGRD 2019). In addition, the private sector is leading a successful water fund to promote good watershed practices (Amerena 2018). GIZ, the German development agency, supported two mangrove restoration projects for 3 km of the 14 km coastline, built educational plant nurseries, and fostered buy-in from communities to continue such initiatives. Two subsequent mangrove planting events have since been independently organized.

Figure 6 provides a snapshot of the city's key policies and plans, political leadership involved in climate adaptation, and initial funding and projects.

3.3.2 Enabling factors in closing the gap between planning and implementation

Powerful, sustained leadership from the private sector: Cartagena provides valuable lessons in how engaging the private sector early on and ensuring its buy-in and participation as partners in adaptation can help raise the profile of adaptation and move the needle from planning to implementation. In Cartagena, the port with all its maritime trade facilities and businesses has been a critical driving force to push for adaptation action. This port sector includes strategic private actors like port associations, the National Business Association of Colombia, and the banking and finance sectors. Their activities are being directly impacted by sea level rise, flooding, and coastal erosion, which has led these critical private sector actors to consider climate change as a cross-sectoral issue, and to view adaptation as indispensable for continued economic growth, stability, and competitiveness (Cartagena de Indias Municipal Government 2014). Through participation in the Plan 4C planning process, primary stakeholders like the private sector ensured that climate change responses were integrated into the strategy, acknowledging the direct link between climate change and future competitiveness and development.

Integrating climate adaptation into existing risk management processes and coordinating at different levels of government: In 2012, Law 1523 established the National Policy for Disaster Risk Reduction and the National Risk Management System (Government of Colombia 2012). This law mandated that managing natural and technological disaster risks is the responsibility and priority of all authorities (public and private) and communities. It requires national, regional, and municipal risk management plans to identify, prioritize, and implement actions to promote disaster risk knowledge, disaster risk reduction, and disaster management. This enabled risk management to become part of land use and development planning processes across the whole country.

In 2016, incorporating climate risks into broader risk management approaches was explicitly mandated and supported through the National Climate Change System. In addition, Law 1931 established guidelines for managing climate change in public and private decision-making.

Figure 6 | **Policy Landscape for Integrating Climate Adaptation in Colombia's Coastal Resilience**

Integration mandated into policies and plans

- Law 1523 mandated management of disaster risks
- Law 1931 established guidelines to manage climate risks
- Nationally Determined Contribution
- National Adaptation Plan emphasizes importance of integrating climate risks across sectors
- Plan 4C: A Competitive and Climate Compatible Cartagena

Political and cross-sectoral leadership

- Legally mandated risk management system from the national to the local level
- The decentralized National Disaster Risk Management Unit (UNGRD) works with key ministries to integrate adaptation
- Climate Change Committee of Cartagena, convening 20 public and private institutions

Initial funding and projects

- Project funding secured for coastal infrastructure
- Private sector leading a water fund
- Mangrove restoration projects

Source: Authors.

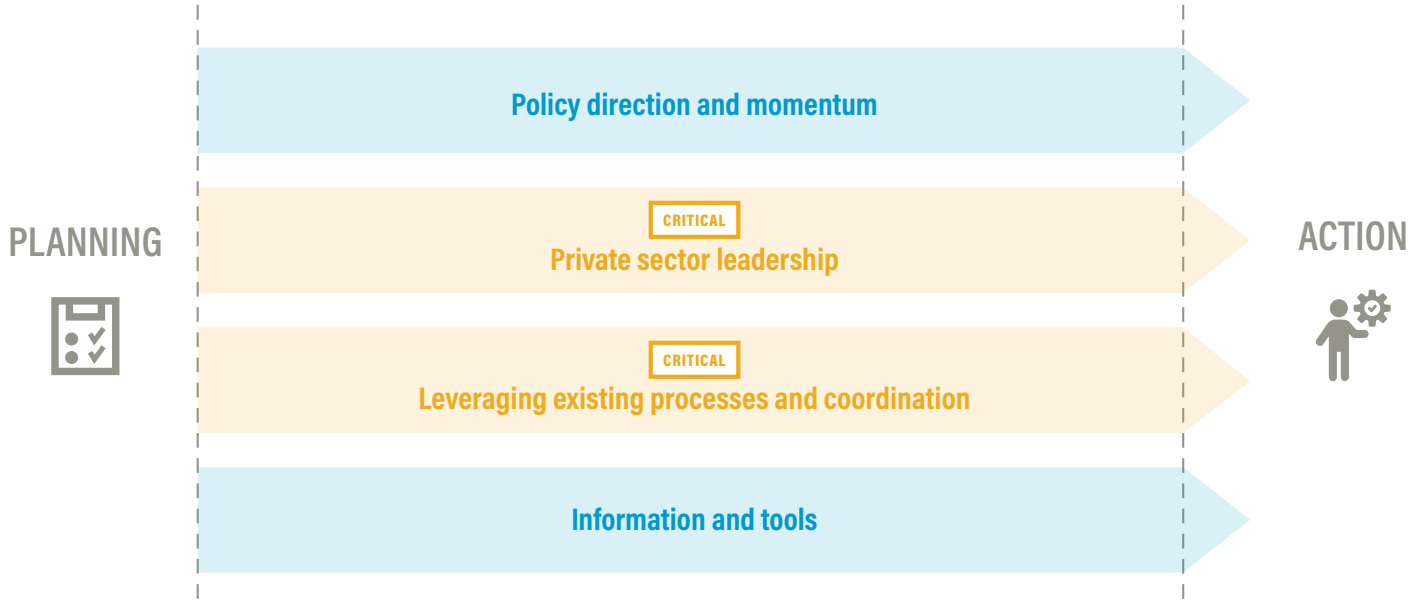
The decentralized National Disaster Risk Management Unit (UNGRD) works with key bodies such as the National Department for Planning and the Ministry of the Environment and Sustainable Development, as well as with national and regional nodes working on climate change policies, to integrate climate risks and adaptation. The regional climate change nodes became formalized in 2016 and provide a valuable and practical multi-stakeholder platform to share information and collaborate on climate change (Dazé et al. 2016).

The participatory, stakeholder-centered planning process and vision for joint implementation of Plan 4C were greatly aided by the creation of the Climate Change Committee of Cartagena, which convened 20 public and private institutions from the national to the local level. In 2018, Colombia published its National Adaptation Plan, which emphasizes the importance of integrating climate risk management across sectors and territories, recognizing that all adaptation is ultimately local and should be based on local participation and priorities (Government of Colombia 2018).

Policy direction and momentum resulting from public disaster declaration and Plan 4C: When the Institute for Marine and Coastal Research identified Cartagena as one of Colombia's most vulnerable locations to the effects of climate change, the municipality of Cartagena—already suffering from severe coastal soil erosion and flood damage to buildings, roads, and important tourism neighborhoods—declared a *calamidad pública*, or public disaster. This declaration, issued in May 2018, led to the channeling of government resources, including 160 million Colombian pesos (approximately US$46,500), or about 9 percent of the district's budget for that year, in 2019 for a project to build infrastructure to address coastal erosion. This project is in the early stages of implementation and will take three years to complete. Interviewees stressed that Plan 4C opened the eyes of public and private actors and the media to the climate change issue and allowed it to remain on the political agenda despite numerous administrative changes in Cartagena's government. Plan 4C has raised awareness and created knowledge exchange opportunities on adaptation approaches like Ecosystem-based Adaptation and Nature-based Solutions.

Information and tools: Colombia has valuable and comprehensive sources of information useful for mainstreaming adaptation, many of which fed into Plan 4C and the Vulnerability Assessment (2011–12). Interviewees cited the Third National

Figure 7 | **Closing the Adaptation Planning and Implementation Gap in Cartagena**



Note: Mogelgaard et al. (2018) outline in *From Planning to Action: Mainstreaming Adaptation into Development* how different "gears," working together, can accelerate the closing of the implementation gap. The weight of each gear as well as the presence of each element may differ in each country context. Our assessment is that private sector leadership and leveraging existing processes and coordination have been critical in moving from planning to action on the ground in Cartagena, Colombia.

Source: Authors.

Communication (2017) as a relevant source for understanding municipalities' climate risks and vulnerabilities. Other sources they mentioned include Colombia's Risk Atlas, vulnerability analyses, and municipal data and resources. The Risk Atlas gathers studies and other resources regarding natural and technological risks developed by the country's public and private entities. It is accompanied by probability evaluations of different risks for decision-making, with maps that show areas under threat and expected annual losses and potential impacts.

Figure 7 shows the main enabling factors that emerged in Cartagena to help close the gap between planning and action.

3.3.3 Challenges in mainstreaming

Many fragmented sources of vulnerability and climate adaptation information exist but they are not available in one consolidated, practical system or accessible to all of the people who need them. Colombia is working to overcome this challenge by developing an Integrated Information System on Vulnerability, Risk and Adaptation through its GCF Readiness Programme to identify, illustrate, and provide evidence of trends. These would then serve as inputs for risk and vulnerability analyses and adaptation assessments, which can then be incorporated into territorial and sectoral planning processes. It is also necessary to train both technical as well as political leaders in DRR and adaptation so that information and capacity building have coherence and continuity across government ministries and departments. Establishing a basis of institutional knowledge is especially important in Cartagena's case, since it has been governed by 11 mayors in the last six years due to political irregularities and suspensions.

Another challenge is the lack of funding, given Cartagena's and the national government's limited budget resources for the large-scale infrastructure projects needed on the coastline where mangroves will prove insufficient. Related to the funding challenge, the private sector needs to invest more in implementation of adaptation interventions and leverage its resources to seek additional national and international finance.

4. LESSONS LEARNED FROM MAINSTREAMING ADAPTATION IN BANGLADESH, THE PHILIPPINES, AND COLOMBIA

This section brings together the factors identified in the three case studies that either advanced or hindered integration of adaptation planning into DRR and its implementation—to identify commonalities between them and illustrate how these communities' efforts may be replicated and tailored for other locations. The case studies share many of the same enabling factors and barriers, which are likely similar for other locations as well.

Common Enabling Factors

The power of policies

In all three cases, policies or national laws mandating integration of climate adaptation into planning processes led to mainstreaming these issues into coastal planning.

- In Bangladesh, both development and climate policies have helped close the implementation gap between planning and action.
- In Malabon City, the Philippines, laws on DRR mandate that cities integrate both DRR and adaptation into urban planning.
- In Cartagena, Colombia, political will and legislative guidance in the form of laws and strategies started the process of explicitly integrating climate risks into national and subnational planning exercises.

Sustained leadership

The three cases reveal that sustained leadership is vital in raising awareness and driving action—and that leadership comes in various forms. Despite the differences in all three cases, leaders drew their power from their persistence and direct links to the large numbers of affected citizens they represented.

- In the case of Bangladesh, it was political leadership and the engagement of parliament that supported mainstreaming.
- In Malabon City, local and community leaders—supported by a global network of CSOs—led the way. Local champions persisted in advocating a narrative that socialized DRR and adaptation concepts and made them part of the communities' priorities.
- In Cartagena, it was the combined effort of leading private sector associations and businesses that leveraged existing political will and supported the drafting of the cross-sectoral Plan 4C to address climate concerns threatening society and the local and national economies.

Accessible information and tools

With regard to information and tools, all three countries have credible institutions dedicated to providing much-needed information by identifying and analyzing climate risks (both current and future) and conducting vulnerability assessments.

- In each case, having access to information—whether through research institutes or meteorological offices—was critical to developing evidence-based plans to build coastal resilience. Climate information is shared with citizens via different communication channels like Colombia's Risk Atlas and Malabon City's flood risk maps printed on tarpaulins.
- Respondents in the Philippines noted that living in better-connected urban areas can also increase access to information and strengthen coastal urban plans, helping communities push for stronger DRR and adaptation measures. However, this urban advantage is not necessarily universal: megacities where land value is extremely high, for example, often face challenges from certain construction companies or other stakeholders with important economic and financial interests.

Coordination across government levels

When it comes to coordination, decentralization is a crucial enabling factor evidenced in all three countries.

- In the case of Bangladesh, adaptation is mainstreamed horizontally across ministries through the establishment of Climate Change Cells within each ministry, and vertically through a large network that extends from the national level to thousands of village disaster committees.
- In the case of Malabon City, local governments are requested to identify and mitigate climate change–related risks. Early warning alerts are managed by both national and local governments and are so

localized that they reach directly to the household level.

- In Colombia, climate risk management is mandated across ministries as well as across local levels of government, with units established all the way from the national to the municipal level.
- Having coordination units, such as the Climate Change Unit in Bangladesh and National Disaster Risk Management Unit in Colombia, can significantly help coordinate across ministries and regions.

Partnerships

All three locations leveraged different types of partnerships, both formal and informal, to keep adaptation on the political agenda and motivate action. These alliances transcended sectors and levels of government to include diverse stakeholders at the national, subnational, and community levels.

- Bangladesh's All-Party Parliamentary Group on Climate Change and Environment exemplifies the value of partnerships in mainstreaming adaptation.
- Partnerships and alliances were also important in Malabon City, where local government and community leaders forged strong engagements with residents and Indigenous communities, people's organizations, civil society organizations, members of PfR, and the national government to develop and implement the urban plan.
- In Cartagena, leading private sector businesses and associations joined forces with political actors and civil society to become true partners in integrating adaptation into Plan 4C. Public-private partnerships with local government, companies, international funders, and NGOs later helped secure funding to initiate adaptation and DRR activities.

Common Challenges

In addition to sharing positive lessons when it comes to mainstreaming and implementing adaptation, these three cases also illustrate important challenges and barriers. While the challenges identified are more inherent features in many contexts and generally less actionable by adaptation practitioners or stakeholders, being aware of the difficulties they present can encourage creative thinking on how to overcome them.

Box 2 | Strengthening Local Institutions' Abilities to Self-Organize Is Key to Adaptation Outcomes

Berman et al. (2020) recently examined the effects of climate change in seven coastal communities across four continents to determine how they are adapting to climate effects. The authors found that communities with strong, self-organized local institutions that can set and enforce their own rules and communicate across scales (e.g., with central authorities, ministries) appeared better able to adapt without substantial loss of well-being than communities where these institutions were weak or absent. Although Bangladesh, Malabon City, and Cartagena did not feature in the Berman et al. study, their finding that enabling factors centering on robust policies and legislation as well as on coordination across government levels is consistent with our research.

Notably, Berman et al. concluded that strong local (informal or formal) institutions are necessary for successful coastal adaptation, and that such local structures must be complemented by cross-scale accommodation and support from higher levels of government to solve local problems. These findings parallel the experiences in Bangladesh, Malabon City, and Cartagena, where national and municipal laws, policies, and strategies have been enacted to accelerate adaptation action on the ground. Active local institutions and actors, formal and informal, were found in the coastal communities with the greatest resilience.[a] This vibrant local environment echoes the experience of Malabon City, where a variety of community leaders engaged entire barangays, and the experience of Cartagena, where local businesses and civil society became highly involved in keeping adaptation on the political agenda.

Note: a. Berman et al. 2020.

Political instability

Bangladesh and Cartagena share challenges with political instability, which often leads to high staff turnover when administrations change. This can result in inconsistent coordination and loss of knowledge and capacity over time, reducing continuity for planning and implementing interventions.

Coordinating across jurisdictions

For the Philippines, the most important barrier that surfaced is the problem of mainstreaming across local administrative boundaries, which requires close collaboration—including at the planning level—with other city and local governments.

Insufficient funding

A sizeable barrier for Bangladesh, Malabon City, and Cartagena in further advancing implementation of adaptation measures is that climate finance is insufficient. For example, Bangladesh has well-established and effective financing mechanisms for implementing adaptation and DRR activities at a large scale that draw significantly from public funds. Even so, the nation must also rely on international funding, and gaps remain. In the case of Malabon City, the LDRRM Funds are an important source for the local governments to prepare for disasters and to finance first relief after a disaster has taken place. However, these funds will be insufficient in the case of major disasters, and the alternative of buying climate risk insurance has not yet received wide support. Cartagena has managed to draw some funding from the central government for implementation, but it is a small amount, able to support only a limited number of activities.

5. RECOMMENDATIONS

The lessons learned through this research on integrating adaptation into coastal resilience planning and closing the implementation gap in Bangladesh; Malabon City, the Philippines; and Cartagena, Colombia, reveal five key recommendations. These recommendations can inform country and subnational governments, funders, and the entities supporting them as they initiate and accelerate adaptation action:

- **Mainstreaming adaptation to close the implementation gap requires a "whole-of-government approach."** It is not just adaptation planners but all ministries and sectors that must address the challenges of mainstreaming adaptation into DRR and other relevant policies to avoid delays in implementing strategies. Linking NDCs with local, regional, and national priorities and fostering multi-stakeholder dialogues can increase buy-in and collaboration for building climate resilience and avoiding redundancies. The whole-of-government approach should focus on strengthening communities by meeting their needs. Research has shown that strong local communities are able to set and enforce rules locally when they receive support from relevant government services to solve local problems.
- **Climate information providers should prioritize providing access to easily understandable and actionable information on climate risks, hazards, and vulnerabilities that can be included in planning processes.** Across three very different contexts, experiences integrating adaptation in coastal resilience planning and implementation have been based on accessing and using climate information. This information must be practical and geared for decision-makers' use. Including climate information is critical for creating evidence-based plans that identify what climate risks—and inherent short- and long-term measures—need to be included, and where the most vulnerable people are concentrated.
- **Climate change leaders who advocate for integrating adaptation—and DRR—into coastal resilience planning should be supported in using the relevant information and analysis supplied by climate data providers.** Leaders who truly understand the importance of connecting adaptation and DRR are more effective champions for addressing climate change. These champions increase the chances of reducing the effects of climate change in coastal areas when they combine risk information with both a short-term (DRR) and long-term (adaptation) perspective in the implementation phase. With greater capacity, they can be more effective at mustering support across sectors and raising awareness and funds to implement solutions for coastal resilience.
- **Parliamentarians and government officials can play a significant role in passing legislation and formulating policies that support the integration of adaptation—and DRR—in the design and implementation of development policies.** It is important for legislative bodies to target the integration of climate adaptation and disaster reduction in a unified policy framework to send clear messages on how to strengthen coastal resilience. Having laws and policies in place provides a mandate for planners to mainstream adaptation—and DRR—in the design and implementation of relevant social and economic development plans across levels of government (from national to subnational). The actions of these elected officials and key administrators are an indication of a country's commitment to addressing climate hazards and enabling inclusion and implementation of adaptation policies across ministries, sectors, and levels (central and subnational).

- **Allocation of domestic funding, in combination with external financial support, is key to addressing the implementation gap.** The (sub)national government should have capacity and a structure in place to manage these funds in line with agreed-upon implementation plans. Bangladesh has dedicated domestic funding mechanisms in place for adaptation and DRR, including the establishment of two climate funds. The Philippines mandates that local governments set aside at least 5 percent of funding for DRR and adaptation, while Cartagena allocated about 9 percent of the district's 2018 budget for coastal erosion measures. Important progress is being made, as the case studies demonstrate, in making public funding available to implement coastal resilience policies when climate adaptation and risk reduction have been combined. The examples demonstrate that transparent and predictable management of the funds is key to fostering progress on implementation of agreed-upon coastal resilience policies.

6. CONCLUSION

Despite challenges like political turmoil or tensions over governing ecosystems that cross administrative boundaries, Bangladesh; Malabon City, the Philippines; and Cartagena, Colombia, have implemented adaptation—and DRR—actions. The administrations in these locations have prioritized climate adaptation and DRR policies, and they have advanced toward implementing them by putting in place enabling factors such as having the right information to accurately assess risk and identify effective solutions, leadership to advance adaptation planning, and laws and policies that mandate the integration of adaptation into coastal resilience. These three case studies demonstrate that progress is possible. We hope that these case studies will inspire others—whether in central or local government, civil society, academia, the business community, or another part of society—to stand up to the climate change challenge they face and strengthen coastal resilience by integrating adaptation into disaster risk reduction across levels of government, jurisdictions, and sectors, thereby moving the needle from policies to action.

APPENDIX A. GENERAL SEMI-STRUCTURED INTERVIEW QUESTIONS FOR COUNTRY EXPERTS

Purpose of the Interview

Mainstreaming adaptation entails integrating adaptation into development plans. In the mainstreaming process, relevant actors, private and public, proactively consider climate risks, vulnerabilities, and impacts in their policies and plans. Mainstreaming adaptation into development policies and plans could lead to the implementation of adaptation action.

The purpose of this questionnaire is to understand the process of mainstreaming adaptation. We aim to learn the enabling factors that have led to narrowing or closing the "implementation gap" as well as the barriers that slow down the process of mainstreaming. We also want to better understand the benefits of mainstreaming.

Section 1: Broad Questions

- Can you tell me briefly about your familiarity and experience with climate change and adaptation?
- Do you think that integrating adaptation into sectoral plans, development policies, or other policy documents is important? Why or why not?
- What level of adaptation planning would you say your country is at?
  - ☐ Incipient
  - ☐ Early
  - ☐ Intermediate
  - ☐ Advanced
- What stage of implementing adaptation would you say your country is at?
  - ☐ Incipient – just starting to think about integrating adaptation
  - ☐ Early – planning for integration of adaptation but no implementation yet
  - ☐ Intermediate – some implementation of adaptation planning in some sectors/ministries
  - ☐ Advanced – many sectors/ministries/programs are considering and implementing adaptation actions
- Has your country been able to mainstream adaptation in the DRR, health, agriculture, watersheds, and/or ecosystems fields? If so, how was adaptation mainstreamed?

Section 2: Enabling Factors and Barriers to Mainstreaming Adaptation

- From this list of five topics (or "gears"), which are the two that really stand out as being enabling factors or barriers, and why? *Interviewers can use the following gears to prompt additional details, e.g., if leadership is mentioned, you can ask the questions listed under Leadership.*
  - ☐ *Policy Framework*:
    - Does your country have political commitments, mandates, and laws that support the integration of adaptation into development planning and/or sectoral strategies? If so, please describe them.
  - ☐ *Leadership*:
    - Are there leaders or champions positively influencing the mainstreaming of adaptation in your country? Who are they, what is their motivation, and what institution/sector/topic do they represent?
    - How have these leaders supported mainstreaming adaptation planning and how has this catalyzed action?
- *Coordination*:
  - ☐ Has there been any cross-sector collaboration to mainstream adaptation?
  - ☐ Has an interministerial steering committee or a task force been set up to support mainstreaming?
- *Information and tools*:
  - ☐ Do people have access to information on climate risks, vulnerabilities, and potential adaptation responses?
  - ☐ Do people have access to planning tools that help mainstream adaptation?
- *Financial process*:
  - ☐ Is there funding for decision-makers to consider climate risks?
  - ☐ Is there funding to track and cover costs of adaptation?
- Other:
  - ☐ Are there other enabling factors or barriers that you would like to highlight?

Section 3: Implementation Stage and the Benefits of Mainstreaming

- Now that you have mainstreamed adaptation, is this leading to the implementation of adaptation action? If so, what is being implemented?
- Is the country gathering any data on the level of implementation or monitoring any outcomes from mainstreaming adaptation?
- Has this implementation shown any benefits? If so, what are the benefits? If not, why not?

ENDNOTES

1. Several indices exist to measure the level of vulnerability to climate change. These include ND-Gain, the Global Climate Risk Index, and Maplecroft's Climate Change Vulnerability Index. Indices use different methodologies, but they all come to roughly the same ranking of climate vulnerable countries. The Global Climate Risk Index indicates a level of exposure and vulnerability to more frequent and/or more severe climatic events for which countries should prepare. It analyzes the extent to which countries have been affected by the impacts of weather-related loss events (e.g., storms, floods, heat waves). The index analyzes the quantified impacts both in terms of fatalities and economic losses that have occurred based on data from Munich Re's NatCatSERVICE.
2. Partners for Resilience launched in 2012 and is funded by the Netherlands' Ministry of Foreign Affairs. It is made up of the Netherlands Red Cross, CARE, Cordaid, International Red Cross Red Crescent Climate Centre, Wetlands International, and 30 civil society partners.
3. The Sendai Framework for Disaster Risk Reduction 2015–2030 (the Sendai Framework) is a 15-year, voluntary, non-binding agreement that recognizes that the state has the primary role of reducing disaster risk, but that responsibility should be shared with other stakeholders such as local governments and the private sector. The aim of the Sendai Framework is the substantial reduction of disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries.

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ABOUT WRI

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Natural resources are at the foundation of economic opportunity and human well-being. 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.

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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.

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