



STATE OF THE NATIONALLY DETERMINED CONTRIBUTIONS: ENHANCING ADAPTATION AMBITION

AARJAN DIXIT, MARCELLA KIM, RYAN O’CONNOR, MELAINA DYCK, AND GIANNA FERRARIN

EXECUTIVE SUMMARY

Highlights

- The adaptation components of countries’ nationally determined contributions (NDCs) to the Paris Agreement are voluntary, and the agreement has not provided guidance for their development.
- This working paper compares both the first and updated NDCs of 86 countries, analyzing changes in their adaptation components.
- About half of both rounds of analyzed NDCs include an adaptation component, with updated submissions including more adaptation components and more detailed actions, suggesting that countries are increasingly viewing adaptation as an important element.
- The analysis highlights the need for improved guidance on including adaptation in the NDCs, increased clarity about the goals and objectives of countries’ adaptation components, and support for investment and implementation plans for prioritized adaptation actions.
- This paper contributes to a growing literature on adaptation ambition and assessment, and it offers findings that can be used by donors, the United Nations Framework Convention on Climate Change (UNFCCC), and country governments to assess the current state of adaptation ambition and improve the adaptation components of future NDCs.

CONTENTS

Executive Summary	1
1. Introduction	5
2. Framework for Assessing Enhanced Adaptation Ambition	6
3. Trends in the Adaptation Component of NDCs	7
4. Key Findings	18
5. Reflections for Further Action	19
6. Conclusion	21
Appendix A	22
Appendix B	32
Appendix C	32
Abbreviations	32
Endnotes.....	33
References	33
Acknowledgments.....	35

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.

Suggested Citation: Dixit, A., M. Kim, R. O’Connor, M. Dyck, and G. Ferrarin. 2022. “State of the Nationally Determined Contributions: Enhancing Adaptation Ambition.” Working Paper. Washington, DC: World Resources Institute. Available online at <https://doi.org/10.46830/wriwp.21.00099>.

Introduction

Nationally determined contributions are a core obligation of the Parties to the Paris Agreement.

Pursuant of Article 4.2 of the Paris Agreement, Parties have committed to prepare, communicate, and maintain successive NDCs with their domestic goals for mitigating greenhouse gas (GHG) emissions (UNFCCC 2015a). Many countries also voluntarily include adaptation in their NDCs as an imperative part of climate action in pursuit of the Global Goal on Adaptation. The Paris Agreement provides some guidance on how countries may provide NDC mitigation information and establishes a basis for adaptation planning outside of the NDCs through the national adaptation plan (NAP) process. However, it leaves countries free to choose how they want to present adaptation information in their NDCs. Existing guidelines for other instruments may be applied to NDC adaptation components, such as Decision 9/CMA.1 for adaptation communications, but designated guidance remains lacking. The decision to voluntarily include adaptation in the NDCs is politically salient because Parties remain divided on whether the component should be a core element of these documents or should remain in separate instruments.

Parties to the Paris Agreement commit to a five-year NDC enhancement cycle, with the expectation that they will ratchet up ambition over time. Ambition in mitigating GHG emissions can be measured through quantitative reductions in emissions. Yet understanding and assessing ambition in adaptation is not easy: no agreed quantitative or qualitative indicators exist for assessing reductions in vulnerability, increases in resilience, or enhanced adaptive capacity. This complexity in measurement has prevented the establishment of a common definition for the term *adaptation ambition*. Despite lacking clear metrics, adaptation ambition remains crucial to protect the most vulnerable as climate change impacts intensify.

Understanding what countries are including in the adaptation component of their NDCs is a critical step toward fully assessing and increasing adaptation ambition. Tracking the adaptation component of each country's NDC and how it is changing over each NDC submission cycle can help inform how countries are tackling climate change adaptation and what types of additional support may be needed.

About This Working Paper

This working paper presents the findings from a comprehensive assessment of the adaptation components of the 86 updated NDCs submitted by the end of June 2021.¹ The assessment also includes the first NDCs as well as NAP documents submitted by these 86 countries to the UNFCCC until the end of June 2021. Although only 9 of the 86 Parties had submitted NAPs, they were included in the analysis as important complements to the NDCs because they often expand on and operationalize NDC adaptation commitments. Countries that had only submitted their first NDCs by the end of June 2021 were excluded from analysis. This paper uses the term *updated NDC* to refer to both updated first and second NDCs submitted to the UNFCCC that are included in the analysis. The assessment is built on past World Resources Institute (WRI) work on NDC enhancement, the Global Commission on Adaptation's work that put forward a bold agenda on adaptation, and guidance from the UNFCCC on adaptation reporting (Bapna et al. 2019; Fransen et al. 2019; UNFCCC 2015b).

This paper does not judge how well each country has enhanced its adaptation NDC. Assessing whether the prioritized actions in a country's NDC will be sufficient to fully address climate change vulnerabilities and impacts is challenging—and their effectiveness will also depend on implementation. This paper instead seeks to identify trends between the first and updated submissions of NDC adaptation components and build a framework for assessing adaptation ambition. All NDC documents used in the analysis can be found on the UNFCCC NDC Registry (UNFCCC 2021b), and the data produced in this assessment is publicly available on the Climate Watch data platform (www.climatewatchdata.org).

The findings from this paper will be useful to bilateral and multilateral donors, the UNFCCC, and the Parties to the Paris Agreement. Donors may be able to use this analysis in conjunction with other adaptation instruments to tailor technical, capacity building, and financial assistance to support adaptation priorities communicated in updated NDCs. The UNFCCC—and, in particular, the Adaptation Committee—can use this analysis to help guide the development of different adaptation instruments. And finally, Parties can use the analysis to better understand how different countries are progressing toward increased adaptation ambition, and they can learn from each other.

Assessing Adaptation Ambition

To help fill the void in establishing standard quantitative metrics for adaptation, this paper presents a set of qualitative criteria for assessing NDC adaptation ambition. The paper breaks down the question of adaptation ambition of the NDCs into the following nine categories:

1. Country ownership
2. Alignment with planning exercises and other adaptation plans and policies
3. Use of latest impact, risk, and vulnerability information
4. Focus on critical adaptation systems as identified in the Global Commission on Adaptation's *Adapt Now* report
5. Presence of additional information for priority actions, such as baselines, time frames, and costs
6. Clarity about monitoring and evaluation approaches
7. Commitments to social inclusion, gender, and equity
8. References to losses and damages from climate change
9. Evidence of transformative adaptation in the prioritized actions

The assessment framework used to analyze the adaptation components of the NDCs includes four sections, which address the nine elements identified above:

- **Elements of adaptation communications:** The first section includes questions based on guidance found in the annex of Decision 9/CMA.1 for adaptation communications (UNFCCC 2015b). Adaptation communications are a different instrument for adaptation reporting under the Paris Agreement, but the guidance for adaptation communications is still relevant for adaptation NDCs. Links between these two instruments are especially pertinent because Parties to the Paris Agreement have the option to use their NDCs as a vehicle for reporting adaptation communications. This component addresses Elements 1, 2, 3, 6, and 7 of the adaptation ambition criteria, relating to ownership, alignment, information, monitoring and evaluation, and equity.
- **Critical systems and sectors in adaptation priorities:** The second section categorizes prioritized adaptation actions based on the critical systems that

the Global Commission on Adaptation identified in its flagship report (Bapna et al. 2019). This component addresses Elements 4 and 5 of the ambition criteria, which concern issues related to information about priority actions.

- **Losses and damages:** The third section addresses Element 8 of the ambition criteria by assessing how issues related to losses and damages² from climate change are addressed in the NDC. It is based on the work plan of the Warsaw International Mechanism on Loss and Damage.
- **Transformative adaptation:** The final section addresses Element 9 of the ambition criteria and assesses whether countries are including actions that could be identified as transformative adaptation, based on WRI work (Carter et al. 2018).³

Key Findings

Our key findings are summarized in Table ES-1. More detailed results of the analysis can be found in Section 3.

Reflections for Further Action

For Country Governments

- Countries should strengthen links between NDCs and other adaptation plans and processes. Improved synergies with the NAP process and adaptation communications could work to improve international visibility for adaptation and advance implementation on the national level.
- Countries should ensure that their adaptation NDCs are strategically aligned with other adaptation instruments under the Paris Agreement. Including adaptation as part of the Enhanced Transparency Framework (ETF) and integrating ongoing adaptation monitoring, evaluation, and learning (MEL) efforts can support tracking of adaptation NDC implementation.
- Countries should engage a wide variety of stakeholders throughout NDC development to ensure inclusive adaptation priorities that meet the needs of the most vulnerable.

For Bilateral and Multilateral Donors

- Climate change will impact all sections of society. In addition to investments in critical systems such as food and nutrition security, nature-based solutions, and water, donors should invest in integrating climate

Table ES-1 | **Summary of Findings for Adaptation Ambition of Updated NDCs**

AMBITION ELEMENT	DESCRIPTION OF FINDINGS
Ownership	Across the board, there is greater awareness and country ownership of the updated nationally determined contribution (NDC) document. Countries have developed more detailed adaptation components in their NDCs, with more consultations across government agencies and diverse stakeholder groups. Many countries also approved their updated NDCs through a high-level national political body.
Alignment	The updated NDCs show improved alignment with other national and international policy processes. The updated NDCs increasingly referenced the influence of ongoing or completed national adaptation plan (NAP) processes at the national level, which are much more comprehensive than the NDC process. References to other subnational, sectoral, national, and international policy processes are more numerous in the updated NDCs.
Latest information	Impact, risk, and vulnerability information used in the updated NDCs reflects the increasing urgency of climate impacts. The latest national communications, or assessments and climate modeling conducted as part of other planning processes, such as the NAP process, have provided countries with up-to-date information. Updated NDCs also more frequently identify specific population groups as more vulnerable to climate change impacts.
Critical systems	Of the critical systems assessed using the Global Commission on Adaptation's <i>Adapt Now</i> report, food and nutrition security, water, and nature-based solutions constitute the largest number of prioritized adaptation actions. However, all critical systems saw an increase in prioritized actions in the updated NDCs compared to the first submissions.
Implementation readiness of prioritized actions	Although updated NDCs include more prioritized actions overall, most of these actions are neither investment nor implementation ready. They require additional work to clarify indicators, costs, and time frames. This should be done in alignment with related instruments, such as NDC implementation plans and NAPs.
Monitoring and evaluation	The updated NDCs increasingly include information related to the monitoring, evaluation, and learning (MEL) of adaptation activities, but the overall number remains low. Coordination between the tracking of NDC activities and communication of this information to the United Nations Framework Convention on Climate Change will be key as countries begin implementation.
Equity and inclusion	The updated NDCs reflect improvements in the integration of gender equality, in particular, but also of local knowledge and indigenous concerns. Although updated NDCs include increased references to indigenous rights, there remains room for improvement regarding the direct consultation of indigenous and local groups in adaptation NDC development.
Losses and damages	Updated NDCs have not increased references to Loss and Damage compared to the first submissions. However, there are more instances of countries including various components for minimizing and averting losses and damages from climate change. These include setting up early warning systems and comprehensive risk management approaches. However, references to slow-onset events, noneconomic damages, displacement, and migration are few.
Transformative adaptation	An understanding of transformative adaptation is lacking across the NDCs. The authors see small increases in references to transformative adaptation in the updated NDCs. Some countries reference attempting to scale adaptation actions more widely and address underlying systemic conditions. But references to actions, including innovation or shifting locations due to climate change impacts, have not increased in the updated NDCs.

Source: WRI analysis.

adaptation into less prioritized systems, such as cities and urban areas, locally led adaptation, adaptation financing, and human health.

- Donors should support work on linking the adaptation elements of the Paris Agreement's ETF with development of national adaptation MEL systems.
- Donors should support developing countries to implement the adaptation efforts identified in their NDCs by assisting with the creation of investment and

implementation plans, reinforcing links to existing national plans and NAPs when available, and further refining MEL frameworks.

- Donors should support national governments in their efforts to minimize, avert, and address climate change-related losses and damages. Supporting comprehensive climate risk management approaches is a strong entry point for this work.

- Though transformative adaptation is critical to respond to present and future climate change impacts, many national governments do not yet explicitly address this in their adaptation NDCs. Donors could help build the capacities of national institutions to drive this agenda.

For the UNFCCC

- Develop improved NDC adaptation guidance for the Parties. Currently, the information that should be included in the various adaptation instruments under the Paris Agreement, particularly NDC adaptation components, is not clear. The Adaptation Committee is already developing supplementary guidance on adaptation communications to help address this gap, and such guidance should map out information needs and synergies between adaptation instruments.
- Improve the details on adaptation included in the annual NDC synthesis reports. By indicating what has changed since the previous round of NDCs, the secretariat could facilitate a process for sharing and learning and could support increased ambition in the NDC enhancement cycle.

1. INTRODUCTION

Nationally determined contributions (NDCs) are an integral part of the Paris Agreement and communicate voluntary actions by countries to mitigate and adapt to the effects of climate change. Though the NDCs focus on domestic mitigation measures, the Paris Agreement created an opportunity for countries to include adaptation in their NDCs as an important contribution to global action on climate change. Parties to the Paris Agreement commit to a five-year NDC enhancement cycle (Article 4.9), with the expectation that they can adjust their NDCs at any time to enhance the level of ambition (Article 4.11). The 26th Conference of the Parties (COP26) in Glasgow urged Parties that had not yet communicated new or updated NDCs in advance of COP27 to revisit and strengthen the 2030 targets by the end of 2022 and develop a work program on ambition and implementation. The COP also requested that the United Nations Framework Convention on Climate Change (UNFCCC) secretariat prepare an annual NDC synthesis report.

This paper assesses whether and how adaptation ambition increased between the first and updated submissions for 86 countries that had updated their NDCs by end of June 2021. The updated NDCs represent the second round of NDC submissions from the analyzed countries and

comprise both updated first and second NDCs submitted to the UNFCCC. Nine of these 86 countries had also submitted their national adaptation plans (NAPs), which were also analyzed. Given the June cutoff date, this paper does not include an assessment of all submitted first or updated NDCs; however, a more complete data set of adaptation information from all updated NDCs is available online in the Climate Watch NDC data platform by the World Resources Institute (WRI).

This paper seeks to contribute to other analyses of NDCs, most of which have focused on countries' mitigation targets. Examples of such analyses have focused on a subset of NDCs (Patel et al. 2020) or on issues such as gender (CARE 2020b; IUCN 2021), have analyzed implementation and support requests (NDC Partnership 2020b), or have considered adaptation as an element of a more comprehensive analysis with adaptation and mitigation elements (NDC Partnership and Vivid Economics 2021). The UNFCCC has produced a summary report of all NDCs, which has an adaptation section (UNFCCC 2021a), and other analyses of adaptation ambition in the NDCs are forthcoming (Patwardhan et al. forthcoming).

To assess enhanced ambition of the adaptation components of NDCs, the authors created an analytical framework based on existing WRI work, including *Adapt Now*, the flagship report of the Global Commission on Adaptation (Bapna et al. 2019), other WRI research on enhancing NDCs (Fransen et al. 2019), and on transformative adaptation (Carter et al. 2021). The framework enables assessment of whether and how adaptation ambition was enhanced in the latest round of NDC submissions, how adaptation actions map across key action areas, and how losses and damages from climate change are reflected in the NDCs as well as instances of transformative adaptation. The findings of the paper reflect broad trends in adaptation rather than a country-specific analysis of the NDCs.

Assessing Adaptation Ambition in NDCs

Climate change impacts are felt forcefully around the world, and new reports (e.g., IPCC 2021) indicate that these impacts will only intensify; thus, adaptation becomes a clearer and more urgent requirement for countries. Raising ambition on adaptation and reflecting this in NDCs, which can both represent the summation of existing strategies and form the basis for subsequent national plans and processes, indicates how seriously

countries are taking the adaptation imperative (NDC Partnership and Vivid Economics 2021; Patwardhan et al. forthcoming).

Increasing ambition in adaptation implies that a country is doing more to adapt, such as by increasing investments, improving protection against climate impacts, widening the scope and coverage of adaptation actions, and improving adaptation implementation and delivery. This improves countries' adaptive capacities and reduces negative impacts on people living in the country, particularly the most vulnerable. Adaptation ambition is necessary to protect the most vulnerable, who have contributed the least to causing climate change, and to clarify the adaptation needs to the international community.

Based on a literature review, consultations with peers, and an initial review of NDC documents, the authors identified nine elements that form the basis of the framework used to analyze increased adaptation ambition in the NDCs. Details on the development of this methodological approach can be found in Appendix A. The elements are as follows:

- Are there increasing efforts to ensure **ownership** of the NDC document? Are political engagements and consultations more extensive during its development?
- Does the adaptation component of the NDC clarify how it **aligns** with other international, national, sub-national, and sectoral adaptation efforts?
- Does the NDC use the **latest information** on climate change impacts, risks, and vulnerabilities? Does it make use of information such as the latest national communications or studies conducted to develop other adaptation plans, such as the NAP?
- Do the prioritized adaptation actions cover **critical systems**, such as food and nutrition security, water, and nature-based solutions?
- Do the prioritized adaptation actions include **targets, indicators, baselines, and costs** to ensure they are ready for implementation?
- Does the NDC identify how adaptation actions will be **monitored and evaluated** and how progress of their implementation will be tracked?

- Are there increased commitments to **equity and inclusion** as indicated by references to the integration of gender, inclusion of indigenous voices, and of local knowledge?
- Are issues related to **losses and damages** from climate change impacts and their links to the adaptation component of the NDC well articulated?
- Is there evidence of thinking related to **transformative adaptation** actions, with a focus on changing underlying systems to increase resilience?

Assessing increases in adaptation ambition, however, is not straightforward; adaptation is context specific and intertwined with the country's development trajectory. It is dependent on, among other things, the nature of climate hazards, national and subnational institutions, social norms, capacities and constraints, and the availability of financing. Adaptation also lacks standard metrics for assessing success or increases in ambition, although efforts are being made, including through the Sharm el-Sheikh work program on the Global Goal on Adaptation (UNFCCC 2021c).

Section 2 of this paper describes the framework the authors used for this assessment. The findings, in Section 3 and synthesized in Section 4, highlight the broad trends in each of these categories that contribute to assessing ambition. These findings underpin the reflections in Section 5 that are identified for three different audiences: country governments, bilateral and multilateral donors, and the UNFCCC.

2. FRAMEWORK FOR ASSESSING ENHANCED ADAPTATION AMBITION

The assessment framework, described in detail in Appendix A and used to analyze the adaptation components of NDCs, comprises four sections:

- **Elements of adaptation communications:** The first section is based on guidance from the UNFCCC found in the annex to Decision 9/CMA.1 for the development of the adaptation communications. The adaptation communication is a different instrument than the NDC but is explicitly linked to NDCs in the Paris Agreement through Article 7.11. Its guidance is still relevant for assessing the NDC adaptation components. In fact, the adaptation component of the NDC can serve as the adaptation communication if a country wishes.

- **Critical systems and sectors in adaptation priorities:** The second section of the framework categorizes the priority adaptation actions in the NDCs using categories developed by the Global Commission on Adaptation’s *Adapt Now* report (Bapna et al. 2019): food and nutrition security, nature-based solutions, water, cities and urban areas, infrastructure, disaster risk management, and financing adaptation. The authors added human health, locally led adaptation, and an “other” category to the list of *Adapt Now* critical system categories. The “other” category was added to capture hard-to-categorize priorities (Bapna et al. 2019). Each adaptation action was also categorized using traditional economic sectors and subsectors to help cross-reference them with the *Adapt Now* categories.
- **Losses and damages:** The third section assesses how countries referenced losses and damages⁴ from climate change in their NDCs. Losses and damages from climate change are part of the Paris Agreement (UNFCCC 2015a) and refer to averting, minimizing, and addressing losses and damages associated with the adverse effects of climate change, including extreme weather and slow-onset events. The questions for this section were based on the work plan of the UNFCCC’s Warsaw International Mechanism on Loss and Damage (WIM Excom 2019b). They include mention of Loss and Damage (L&D) as well as economic and noneconomic costs. The framework also checks whether the NDCs mention slow-onset events, displacement and climate migration, and comprehensive risk management and insurance.
- **Transformative adaptation:** The final section identifies transformative adaptation priorities. The questions for assessing this were based on WRI’s work on transformative adaptation (Carter et al. 2018, 2021; Ferdinand et al. 2020) that identified transformative adaptation actions in the food and nutrition security thematic area in the first NDCs. The authors broke down transformative adaptation as actions that seek to create systemic change through an expansion in scale, through innovation, or through a shift in location in response to climate change (Carter et al. 2018). Though there are connections between transformative adaptation and efforts to minimize, avert, and address losses and damages from climate change, this assessment did not identify overlaps between the two.

3. TRENDS IN THE ADAPTATION COMPONENT OF NDCS

The trends presented in this section are findings from the analysis of the NDCs of 86 countries that had submitted updated NDCs by the end of June 2021. They do not include data from more recent submissions or from the first NDCs of countries that had not submitted an update by the end of June 2021.

Most non-Annex 1 (i.e., developing) countries have included an adaptation component in their updated NDCs, but most Annex 1 (i.e., developed) countries have not. European Union countries that did not include an adaptation component in their first or updated NDC influenced this trend. Of the 86 countries assessed, 46 first NDCs and 48 updated NDCs contained an adaptation component. Countries that did not include adaptation in their first NDCs, including Andorra, Australia, Bosnia and Herzegovina, Iceland, Montenegro, and North Macedonia (UNFCCC 2021b) have included an adaptation component in their updated NDCs, reflecting their desire to elevate the priority of adaptation alongside mitigation. However, some countries that included adaptation in their first NDCs have not included it in their updated NDCs. These countries, including Brazil, Grenada, and the Marshall Islands, either refer to their NAPs or include plans for communicating adaptation information to the UNFCCC through a different instrument, such as an adaptation communication (UNFCCC 2021b).

There is diversity in how adaptation is included in NDCs. The inclusion of adaptation in the NDCs remains voluntary, and the UNFCCC has provided no guidance to Parties on how they can structure and develop the adaptation components of their NDCs. Some NDCs include comprehensive information related to national circumstances, adaptation planning, and adaptation implementation, but others do not. For instance, some present only a table of prioritized adaptation actions with limited associated information.

Most countries do not link the adaptation components of NDCs to the adaptation communications. Although countries such as Argentina, Colombia, and Kenya reference such links (UNFCCC 2021b), they account for only 8 countries among the 86 assessed that note that the adaptation components of their NDCs are the sole component of their adaptation communications, and 78 countries do not. The rest either make no mention

of adaptation communications or explicitly state that the NDC components are different from adaptation communications. By the end of June 2021, only 16 countries had submitted adaptation communications. Unless countries are clear about the objective of each adaptation instrument under the Paris Agreement, it is highly probable that the same adaptation information could be repeated across different instruments. Though this could reflect improved coordination of adaptation information, it could also lead to duplicated effort or the sharing of contradictory information across different instruments.

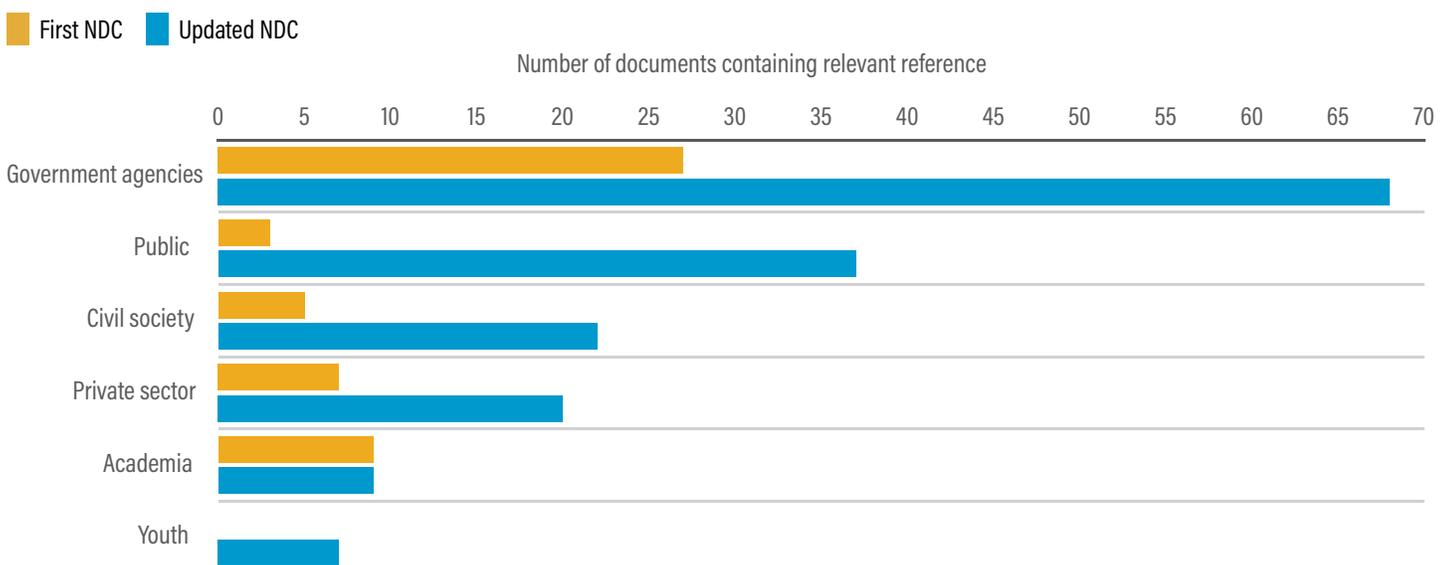
Country Ownership and the NDC Development Process

Most first- and second-round NDCs describe the process of developing their NDCs, with richer descriptions provided in the updated NDCs. Sixty-three first NDCs and 74 updated NDCs included descriptions of the process the countries followed to develop their NDCs, including the institutions involved, the stakeholders consulted, and the way the NDC was approved. In general, the updated NDCs included more details about national institutional arrangements to advance climate action. In the updated NDCs, Fiji and Honduras, among others, reported stronger engagement of government agencies and line ministries (UNFCCC 2021b). Many countries also

mentioned additional stakeholder groups they consulted during NDC development, resulting in more inclusive adaptation targets and actions. Figure 1 breaks down the number of times the NDCs mention engaging with a particular group. Updated NDCs were either approved through a cabinet decision or through another high-level political body, which was not always the case with the first NDCs. High levels of engagement and coordination during development, as well as political buy-in due to endorsement through a cabinet decision, implies that government and societal ownership and awareness of the updated NDCs is higher than for the first round of NDCs.

In contrast, only 23 first NDCs and 28 updated NDCs provided separate descriptions of how countries developed the adaptation components. Often the teams involved in NDC adaptation development are not the same as those involved in mitigation, though they may be from the same government agency. The types and nature of stakeholders that need to be consulted are also very different for adaptation. Where provided, descriptions of the adaptation development process included additional details, such as references to future plans for enhancing NDC adaptation components, plans for the development of an adaptation communication, or for the completion of the country’s NAP process.

Figure 1 | Stakeholder Engagement in First and Updated NDC Development



Note: NDC = nationally determined contribution.

Source: Authors’ analysis.

Alignment with Other Plans and Policies

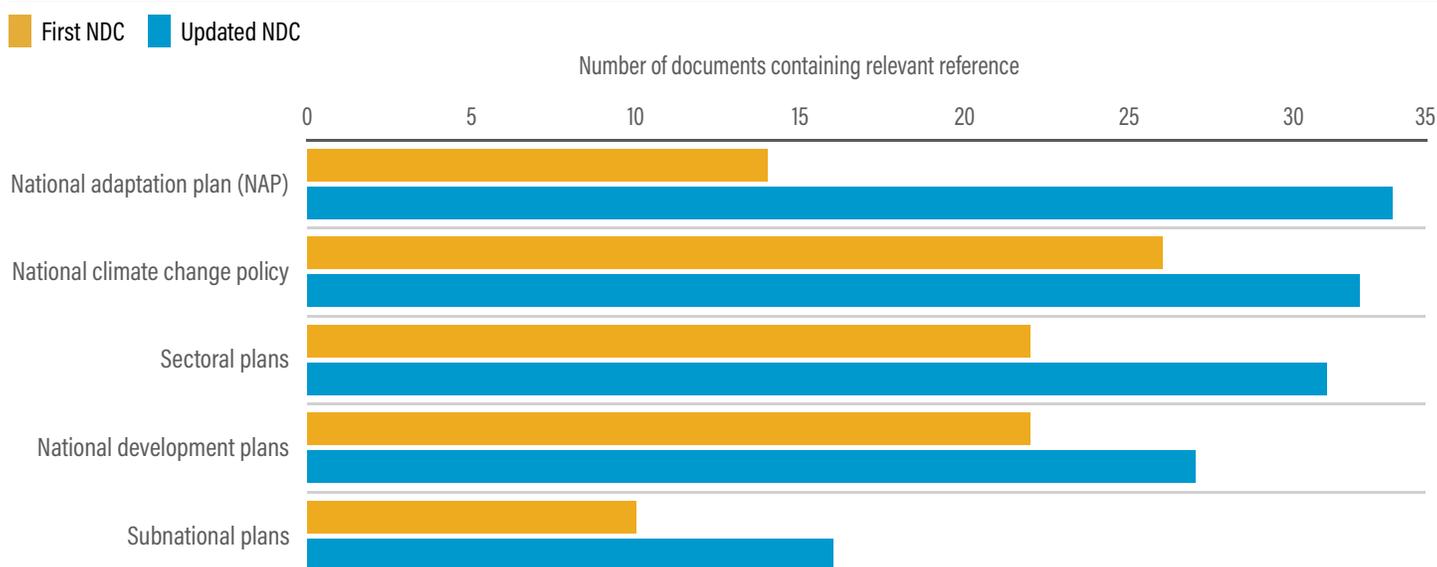
Compared to first NDCs, more updated NDCs explain how countries have aligned the adaptation component with other national and sectoral plans and policies. The updated NDCs include more references to other national, sectoral, and subnational plans and policies. Updated NDCs, such as those for Colombia and the Dominican Republic, often include the NAP, other national climate change policies and plans, sectoral plans, and national economic development plans (UNFCCC 2021b). Figure 2 shows the number of times the adaptation components of the NDCs refer to national, sectoral, economic development, or subnational plans and policies.

The NAP process, whether in progress or completed, seems to drive many elements of the adaptation component of NDCs (Dazé et al. 2018; Noble 2018; Smithers et al. 2017). Significantly, when compared to first-round NDCs, more updated NDCs refer to their country’s NAP process—completed or ongoing—as influencing the adaptation NDCs. The NAP process is a much more comprehensive national adaptation planning process because it enables countries to “identify and address their medium- and long-term priorities for adapting to climate change” (Hammill et al. 2019). The NAP documents reviewed for this assessment, for example, provide more detailed information about

climate hazards, vulnerabilities, and risks; institutional arrangements; vertical and horizontal coordination; and sectoral adaptation processes and priorities than the NDCs. The numerical difference in prioritized adaptation actions between NDCs and NAPs illustrates the comprehensive nature of NAPs as a planning instrument. The nine NAP documents identified an average of 98 adaptation priority actions, whereas the first NDCs averaged 10 and the updated NDCs averaged 12 prioritized adaptation actions.

Updated NDCs make more references to other international conventions and frameworks. These references indicate that countries see the NDCs as connected to other international processes, not just the UNFCCC (Singh et al. 2016; Smithers et al. 2017; UNFCCC 2021a). Many updated NDCs refer to the Sustainable Development Goals (SDGs) in particular, with some countries presenting detailed mapping to the SDGs. There are also references to the Convention on Biological Diversity, the Sendai Framework for Disaster Risk Reduction, the UN Convention to Combat Desertification, and the Ramsar Convention. However, these references lack detail, and NDCs do not include information detailing the exact links.

Figure 2 | **References to Other National Planning Processes in First and Updated NDCs**



Note: NDC = nationally determined contribution.

Source: Authors’ analysis.

Information about Climate Impacts, Risks, and Vulnerabilities

Countries have used information from their latest national communications and other recent assessments to present information related to climate change impacts in their updated NDCs. Impacts are driven by changes in rainfall patterns and temperature, increases in sea level, ocean acidification, increased frequency and intensity of hydrometeorological events, and loss of water reserves. Including this information in the updated NDCs reflects the increasing urgency of climate change due to growing severity and frequency of short-, medium-, and long-term impacts. For example, Panama has significantly increased the details surrounding climate change trends and impacts in its updated NDC (UNFCCC 2021b).

Updated NDCs more frequently identify specific population groups that are more vulnerable to climate change impacts. A number of specific population groups are identified, with women, children, and the elderly noted as being particularly vulnerable to the impacts of climate change (Figure 3).

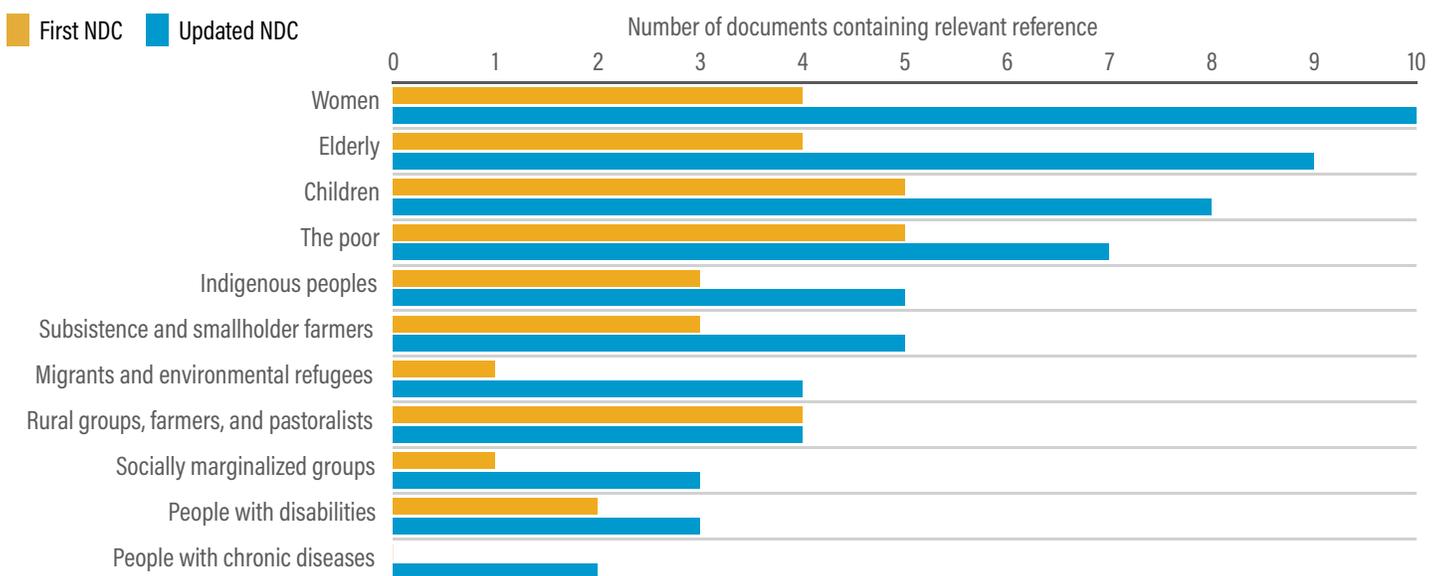
Prioritized Adaptation Actions

Countries in this assessment have included a wide range of prioritized adaptation actions in their NDCs. Of the 48 countries that include an adaptation component in their

updated NDCs, a majority (39) include a list of prioritized actions. Some of these actions are broad descriptions of strategic intent or overarching program work; others set out intended actions and activities. The authors found that priorities in the NDCs map well against the core *Adapt Now* report’s critical systems.

The number of adaptation priorities has increased in the updated NDCs. There is a notable increase in adaptation priorities related to advancing nature-based solutions across all updated NDCs, with a focus on embedding nature-based solutions in adaptation planning and policy. The number of priorities related to water, food and nutrition security, cities and urban areas (mainstreaming climate risks into service delivery), infrastructure (inclusive climate-informed planning), human health, financing adaptation (scaling and deploying public finance effectively), and locally led adaptation has also increased. However, the number of actions relating to cities and urban areas, locally led adaptation, financing adaptation, and human health is relatively low in both the first and updated NDCs. Figure 4 shows the breakdown of all prioritized adaptation actions found in the first and updated NDCs, organized according to the *Adapt Now* critical systems.

Figure 3 | Vulnerable Groups Identified in First and Updated NDCs



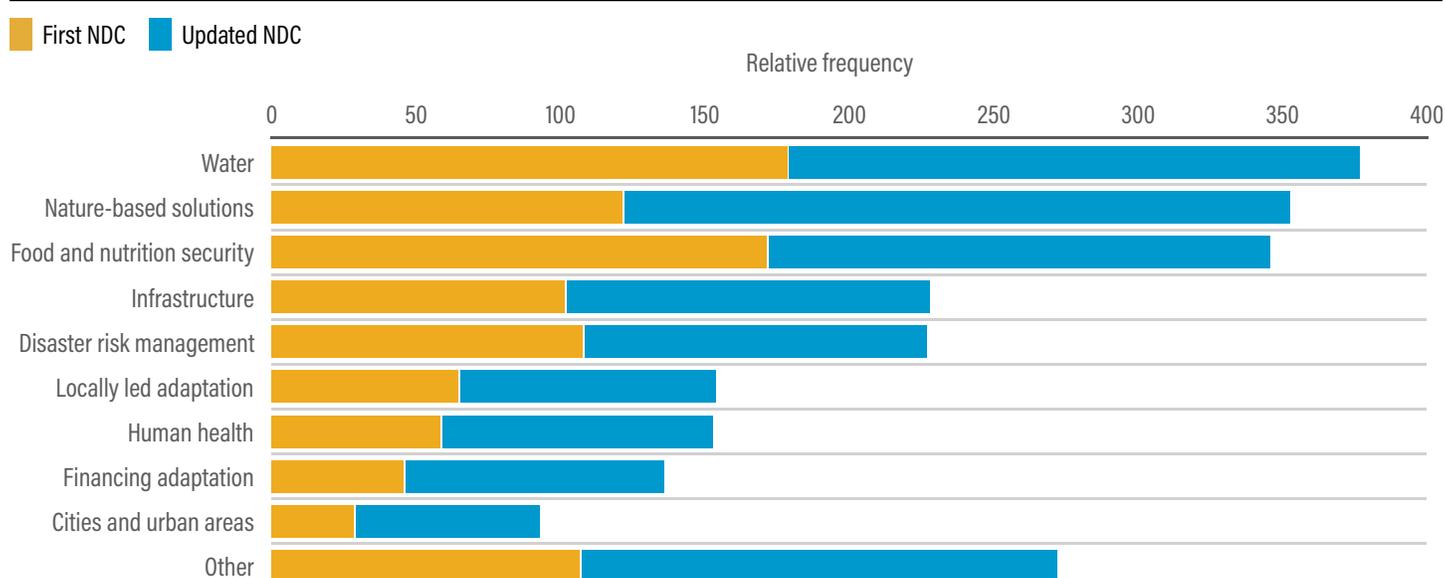
Note: NDC = nationally determined contribution.

Source: Authors’ analysis.

More than 100 adaptation priorities in the first NDCs and 165 priorities in the updated NDCs did not fall within the *Adapt Now* critical systems and were categorized by the authors as “other.” By cross-referencing “other” priorities with traditional economic sectors, we found that most were related to cross-cutting issues such as capacity building and knowledge transfer, economy-wide considerations, and investments in climate services, education, social development, tourism, and energy. These activities were missing in the *Adapt Now* report’s articulation of critical systems for adaptation.

The increase in adaptation priorities across updated NDCs was not evenly distributed across all countries assessed. A few countries that have significantly increased the number of adaptation actions in their updated NDCs drive most of the increase. Others have actually decreased the number of priorities between their first NDC and updated NDC (Table 1). The number of priorities per NDC alone may not be an appropriate indicator for assessing increased adaptation ambition because a deeper assessment is needed to understand the nature of such changes.

Figure 4 | Breakdown of Prioritized Adaptation Actions in First and Updated NDCs



Notes: NDC = nationally determined contribution. These numbers avoid double counting for priorities that were coded for multiple subsectors of the same category.

Source: Authors’ analysis.

Table 1 | Top-Five Country Examples with Significant Changes in Total Number of Adaptation Priorities

	COUNTRIES
Including priorities in updated nationally determined contribution (NDC) with 0 priorities in first NDC	Chile (+31), Panama (+23), Papua New Guinea (+17), Monaco (+6), Andorra (+1)
Largest increase in number of priorities between first NDC and updated NDC	Dominican Republic (+76), Cambodia (+73), Costa Rica (+58), Kenya (+32), Maldives (+25)
Decreasing number of priorities between first NDC and updated NDC	Zambia (-29), Peru (-13), St. Lucia (-12), Jamaica (-9), Thailand (-7)

Notes: Andorra references multiple adaptation actions in its updated NDC, which originate from a separate planning document, but provides little detail. The authors did not count Chile’s increase in the second category to highlight a diverse set of country efforts in the NDCs.

Source: Authors’ analysis.

The change in the number of priorities may be due to many factors. For example, some countries may decide to consolidate and focus their activities for strategic reasons or because they have completed a NAP that covers adaptation actions in detail. It is important to look at the intent and synergies of each action and assess how countries are aiming to build resilience across their critical sectors. But assessing intent is not possible from the review of the NDC documents alone, which do not include much information. The data on the Climate Watch platform and in Appendix C of this paper list the number of prioritized adaptation actions in all NDCs by country, categorized according to the critical systems of the *Adapt Now* report (Bapna et al. 2019) and allow comparison of national actions.

Implementing Prioritized Adaptation Actions

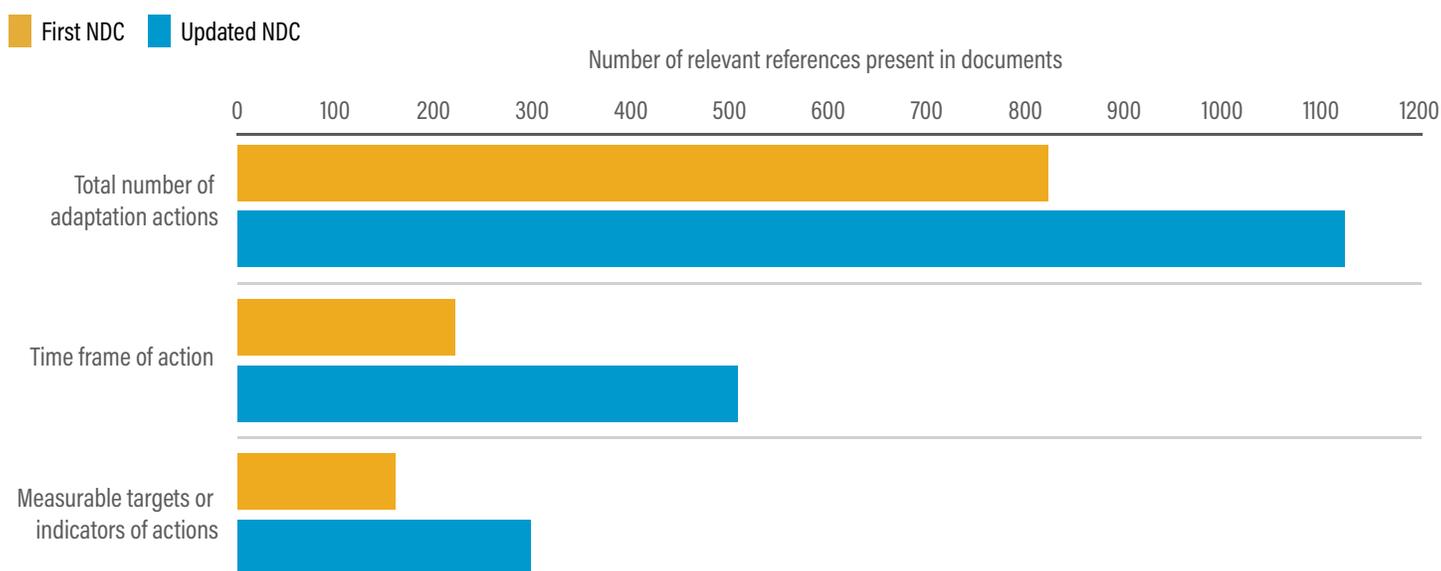
Even though the number of actions with indicators, baselines, targets, and specified time frames has increased in the updated NDCs, they account for a relatively small fraction of the total number of adaptation actions. This suggests that although the NDCs are a good indicator of adaptation priorities, more work is necessary to get them ready for implementation. Implementation action may take the form of supporting NDC implementation plans or integrating NDC actions into other planning processes, such as the NAP, where their increasing ambition can be

supported by the NDC Partnership (NDC Partnership 2017). Figure 5 breaks down prioritized adaptation actions in the NDCs, according to their level of specificity.

The 86 countries included in this analysis reported a major increase in the total costs of prioritized actions between their first and updated NDCs. Increases are reported for both conditional actions not possible without external financing and unconditional actions to which countries are committed regardless of the availability of external financing. More countries have also included costs for prioritized actions. Figure 6 shows the number of NDCs that include cost estimates, and Table 2 provides a sum of the total costs for conditional and unconditional actions identified in the NDCs.

However, there are some concerns with these figures: the number of analyzed countries that include cost figures for their adaptation priorities is low (only 22 countries of the 86 assessed), the method used to calculate these costs is not described, and the costs stated are for different time periods. It is also not clear why cost estimates have increased—whether they are driven by greater adaptation need or more robust calculations. These concerns mean that summing up the cost figures available may not provide a full or accurate picture of adaptation needs. The availability of adaptation finance also still lags behind mitigation finance despite growing needs.

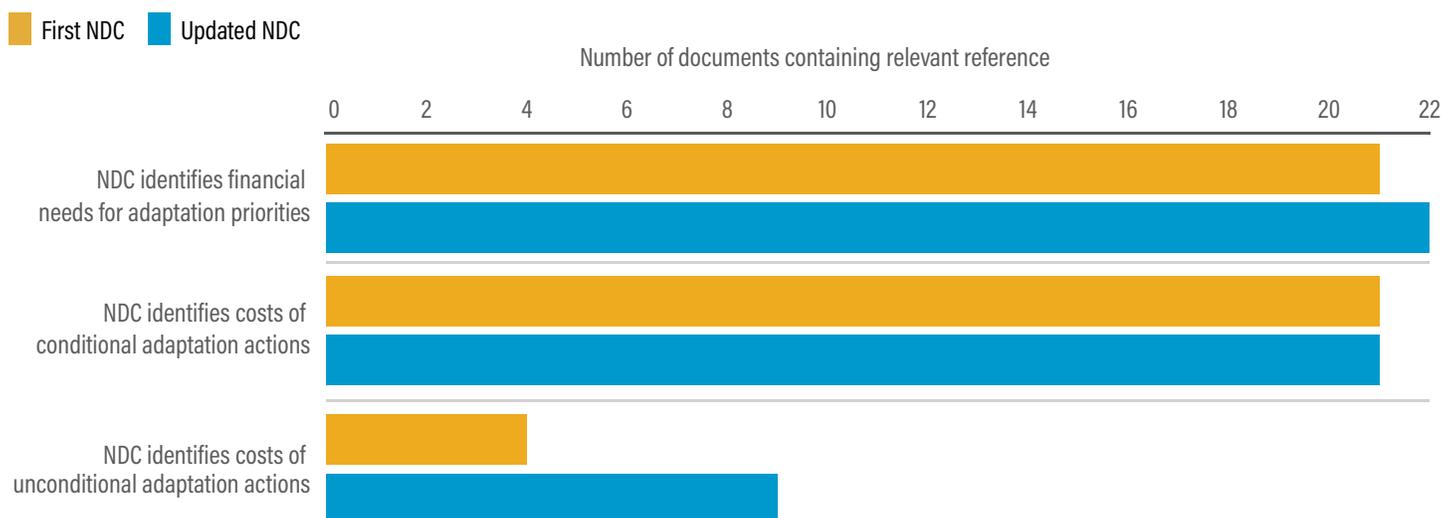
Figure 5 | Indicators and Time Frames Identified for Prioritized Action in First and Updated NDCs



Note: NDC = nationally determined contribution.

Source: Authors' analysis.

Figure 6 | Number of First and Updated NDCs Reporting Financial Costs for Adaptation Actions



Note: NDC = nationally determined contribution.

Source: Authors' analysis.

Table 2 | Total Adaptation Costs Stated in the 86 Assessed NDCs

DOCUMENT TYPE	TOTAL COSTS OF UNCONDITIONAL ADAPTATION ACTIONS (US\$)	TOTAL COSTS OF CONDITIONAL ADAPTATION ACTIONS (US\$)
First NDC	1 billion	88 billion
Updated NDC	76 billion	340 billion

Notes: NDC = nationally determined contribution. This table presents adaptation finance information from the first and updated NDCs of the 86 analyzed countries only. Total costs were calculated separately by document type for the purpose of comparison between rounds of submission and do not reflect the total aggregate costs for adaptation finance across all countries up to June 30, 2021.

Source: Authors' analysis.

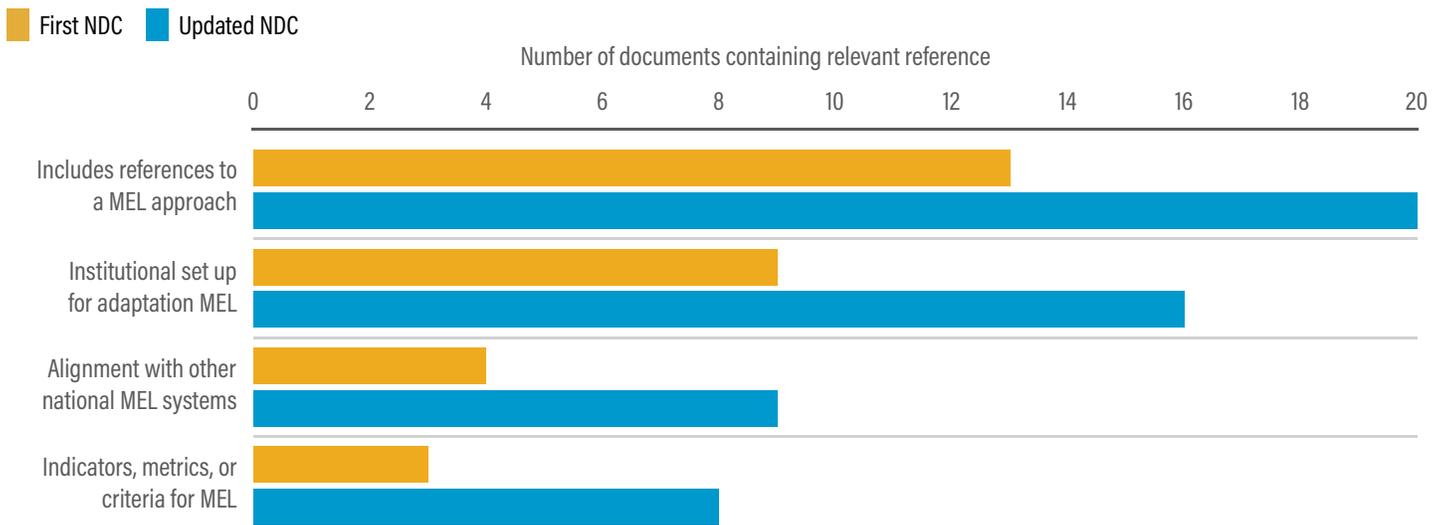
Monitoring, Evaluation, and Learning of Adaptation

There is a slight increase in the number of countries that included information about how they will monitor and evaluate the adaptation component of their updated NDCs, but this number is still less than half of all countries that include an adaptation component in their NDC. Most of the countries that include information on adaptation monitoring, evaluation, and learning (MEL) mention work under way to develop a MEL system to track progress of NDC implementation (Figure 7). In part, this is driven by the need to meet commitments under the Paris Agreement as part of the Enhanced Transparency Framework (ETF). Rwanda, for example, has communicated significantly

greater details on adaptation MEL in its updated NDC (UNFCCC 2021b).

The inclusion of adaptation information in NDCs remains voluntary, so countries have a lot of flexibility in how they set up a MEL system to track implementation progress. Moreover, adaptation MEL remains complex. Some countries mention plans to link the NDC tracking system with national-level adaptation MEL systems already in place or in development (AC 2021). The alignment and integration of these two approaches for adaptation MEL is critical for improving adaptation ambition over time.

Figure 7 | **First and Updated NDCs Providing Information on Adaptation MEL**



Note: MEL = monitoring, evaluation, and learning; NDC = nationally determined contribution.

Source: Authors' analysis.

Inclusion of Gender, Indigenous Peoples, and Local Knowledge

Updated NDCs show a considerable increase in their integration of gender. More countries are taking steps to address equal participation and influence of women in decision-making and ensure that allocation of resources and benefits addresses gender inequality. They have also started including gender equality and women's empowerment in adaptation MEL processes. Other recent assessments of NDCs have also shown that gender integration has improved in the updated documents (CARE 2020b; IUCN 2021; NDC Partnership 2020a). Figure 8 shows the indicators used in this assessment to track how gender equality is integrated across the adaptation component in particular.

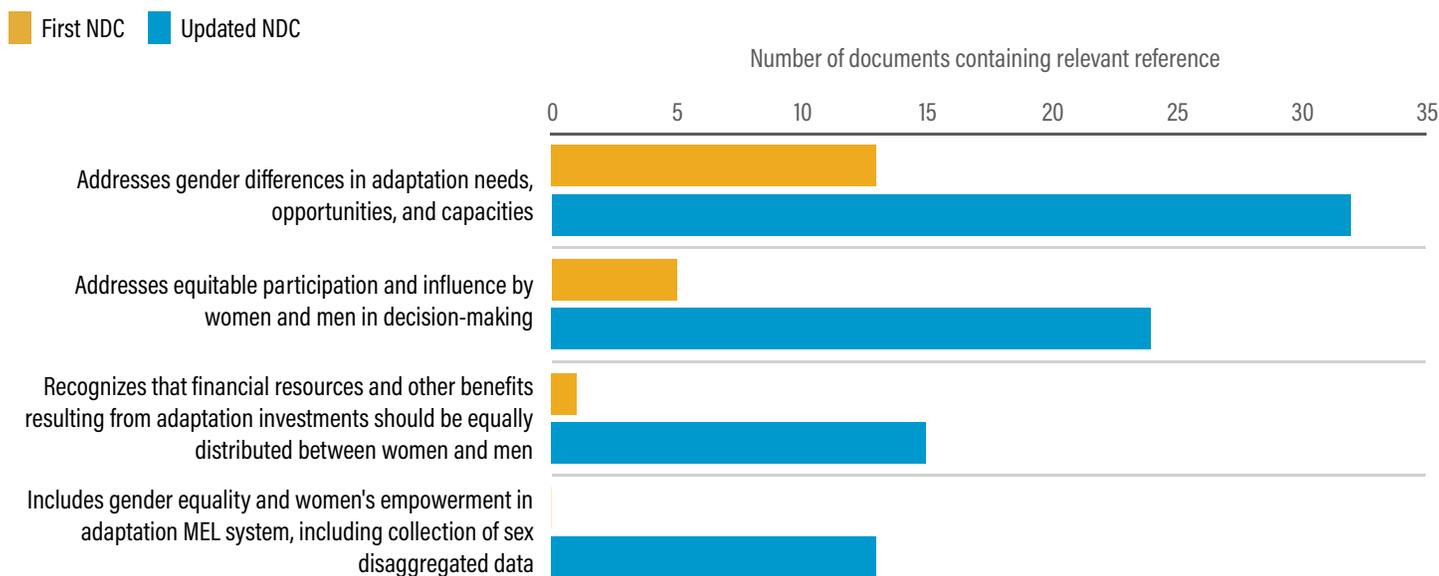
The updated NDCs reflect more inclusion of indigenous communities and local knowledge. Updated NDCs make more references to inclusion of indigenous groups and local knowledge; support for their rights, agency, and governance systems; and preservation of indigenous and local knowledge systems (Figure 9). Although only a few NDCs refer to preserving rights to self-determination, five countries make the commitment as part of the adaptation component of their updated NDCs. Countries such as Cambodia and Nicaragua show increased commitments to gender integration and the inclusion of indigenous communities in their updated NDCs (UNFCCC 2021b).

Losses and Damages from Climate Change in the NDCs

Fewer updated NDCs reflect the economic costs of extreme events. In their first NDCs, some countries included the economic costs they suffered because of extreme events. These figures provide only a snapshot of costs in time, and countries rarely provide historical trends. They also do not provide a breakdown of these high numbers. Across the 86 updated NDCs analyzed, countries have continued to include current economic losses and damages from extreme events as examples of losses and damages from climate change. But the total number of countries using losses from extreme events as examples has decreased slightly.

Few countries include information about future economic costs, and the number including this information in their updated NDCs has remained unchanged. Only a handful of countries discuss the use of climate change scenarios to calculate these future losses and damages. Additionally, the authors found no references in the NDCs to emerging risks beyond adaptation nor an articulation of hard or soft adaptation limits.

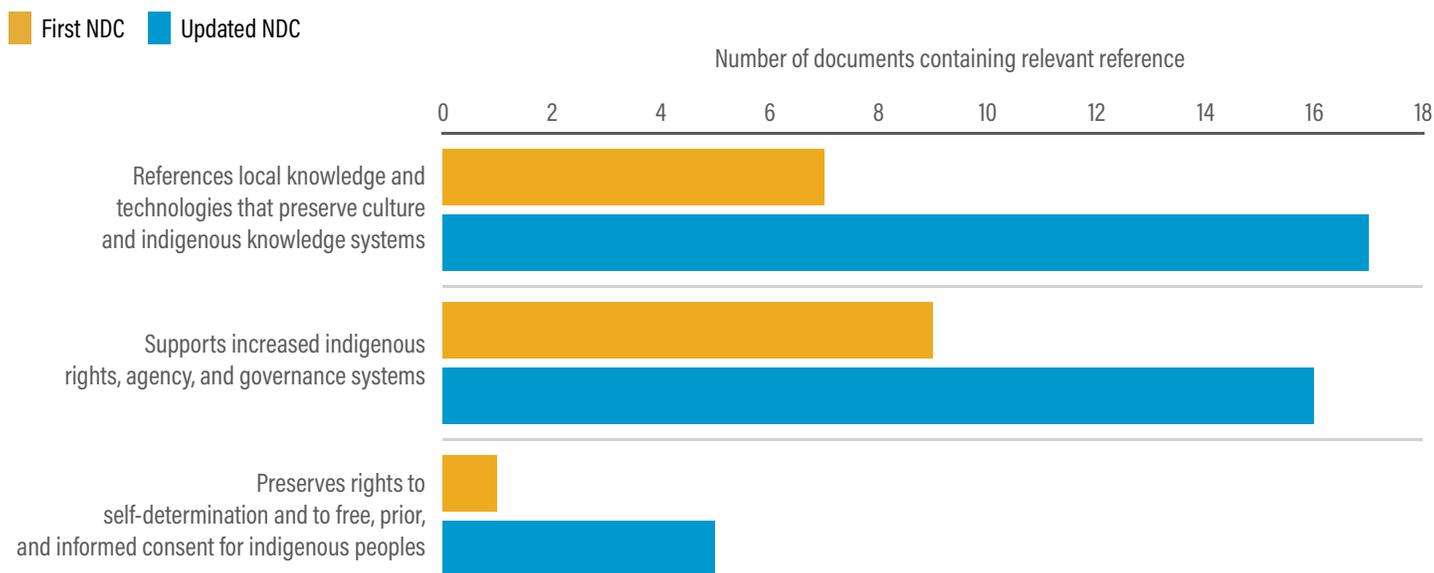
Figure 8 | Gender Integration in First and Updated NDCs



Notes: MEL = monitoring, evaluation, and learning; NDC = nationally determined contribution.

Source: Authors' analysis.

Figure 9 | Inclusion of Indigenous and Local Communities in First and Updated NDCs



Note: NDC = nationally determined contribution.

Source: Author's analysis.

Most countries have shied away from defining the term *L&D*. It has become very relevant in international climate policy over the last decade, but only Peru, Papua New Guinea, and Vietnam have included a clear definition in their updated NDCs (UNFCCC 2021b). This suggests that *L&D* remains a “state of art” term in the negotiations, and countries have limited experience of operationalizing the term within their national contexts. Figure 10 provides references to how countries are including the term in their NDCs.

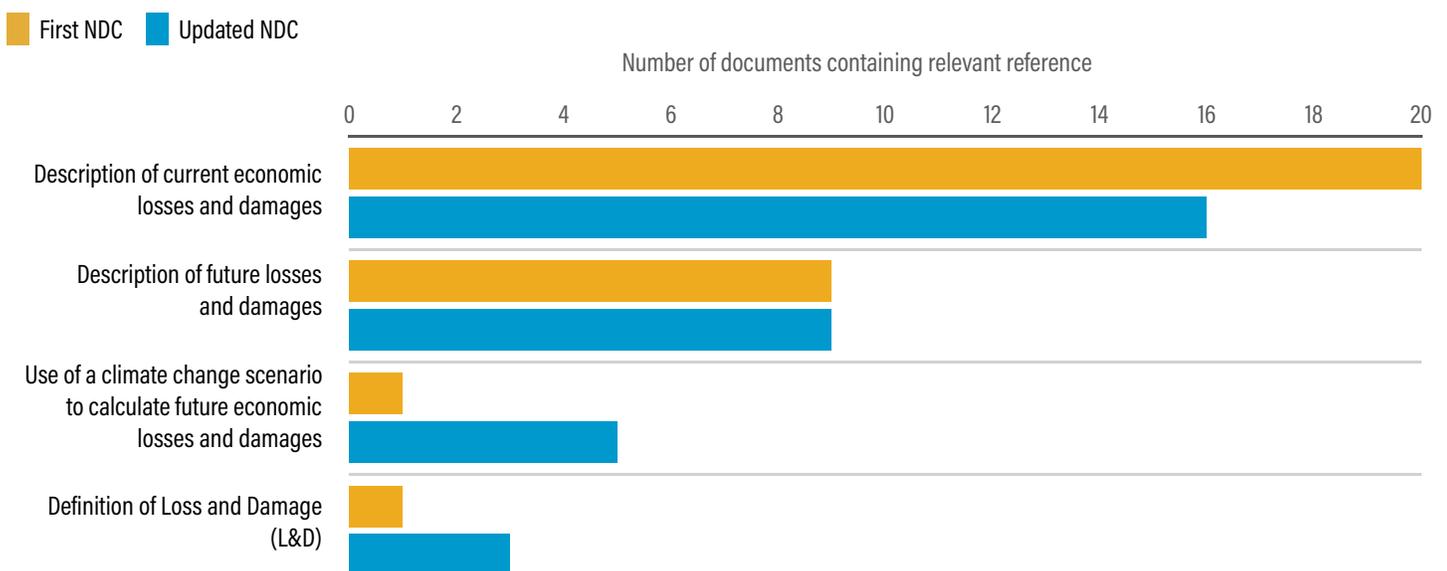
Despite the lack of a definition, the authors found elements of averting, minimizing, and addressing climate change L&D in the updated NDCs (see Figure 11). More updated NDCs mention slower onset events; include references to mobility, displacement, and planned relocation in response to climate impacts; and include issues related to finance and capacity building for L&D. Actions related to comprehensive risk management—such as setting up early warning systems (averting), instituting risk transfer mechanisms (minimizing), and strengthening emergency response and recovery (addressing)—provide opportunities for countries to begin the practical integration of L&D in the adaptation component of their NDCs (Addison et al. 2021).

Transformative Adaptation in the NDCs

References to *transformative adaptation* are limited in the NDCs. Transformative adaptation is a fundamental shift in underlying systems in response to actual or expected climate change and its effects. It is distinct from incremental actions that attempt to maintain existing system norms (Noble et al. 2014). Only five updated NDCs explicitly mentioned the term *transformative adaptation*. The authors found no evidence in the NDCs to suggest that adaptation actions were prioritized on the basis of long-term adaptation pathways, identification of levers for causing system shifts, or avoidance of maladaptation. In fact, countries do not have a uniform understanding of transformative adaptation as changes in underlying system properties in response to or anticipation of climate change. In addition to a lack of consensus among countries about transformative adaptation as a concept, the lack of details regarding the scale or intent of adaptation priorities in the NDCs made it difficult to adequately assess the transformative potential of priority actions.

However, the authors identified different elements of transformative adaptation in the prioritized adaptation actions. Updated NDCs had more prioritized actions that included elements of scaling actions over a larger geographic area or population group. This was reflected

Figure 10 | **References to L&D in First and Updated NDCs**



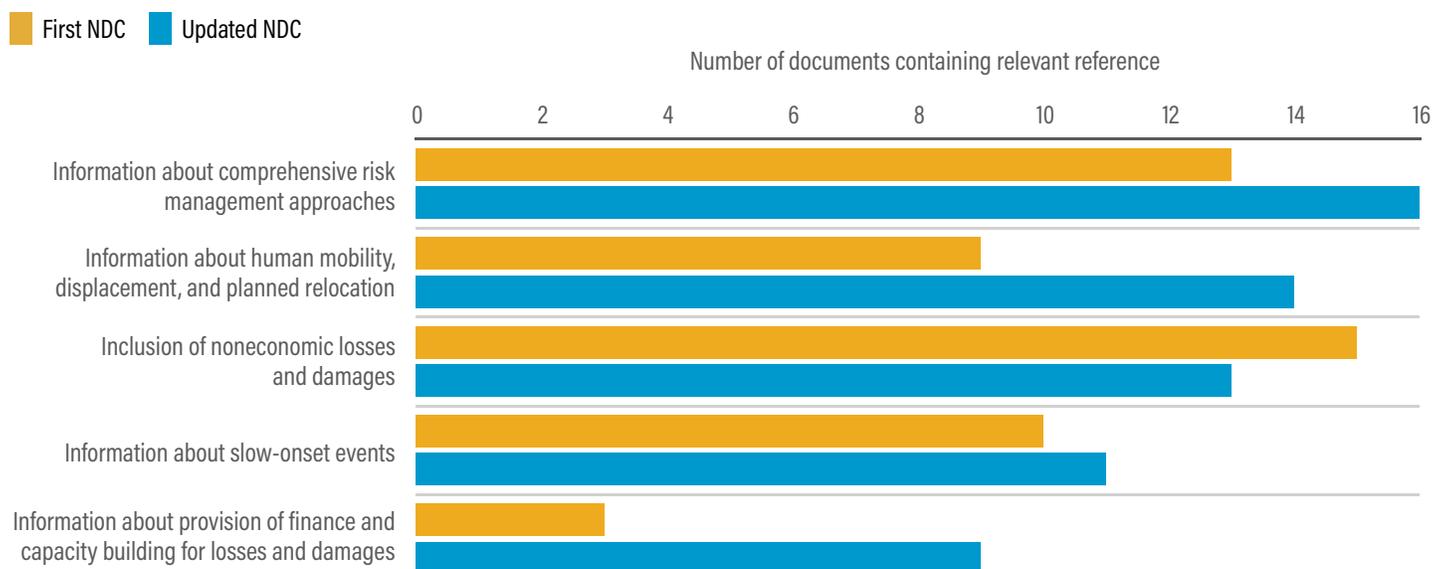
Note: NDC = nationally determined contribution.

Source: Author’s analysis.

in either the wording or in the target of the action. More actions in the updated NDCs aimed to scale their activities while addressing underlying systemic concerns. Yet there was a drop in references to innovation as part of the prioritized actions between the first and

updated NDCs. Figure 12 breaks down elements of transformative adaptation in the first and updated NDCs. Table 3 provides examples of the types of transformative adaptation actions in the NDCs.

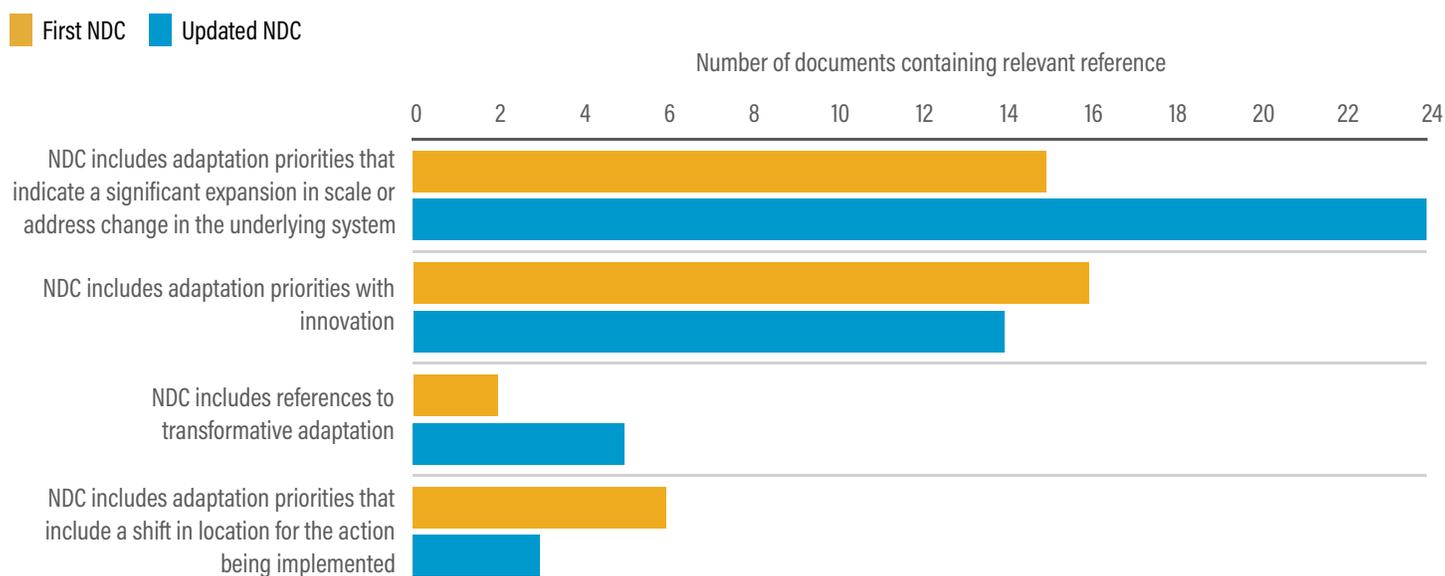
Figure 11 | **References to Different L&D Topics in First and Updated NDCs**



Note: NDC = nationally determined contribution.

Source: Author's analysis.

Figure 12 | **References to Different Elements of Transformative Adaptation in First and Updated NDCs**



Note: NDC = nationally determined contribution.

Source: Author's analysis.

Table 3 | **Examples of Transformative Adaptation**

COUNTRY	DOCUMENT	PRIORITIZED ADAPTATION ACTION
Morocco	Updated nationally determined contribution (NDC)	Agriculture: "Extension of irrigation to new agricultural perimeters, covering an area of 60,000 ha, for a total investment of 3.5 billion USD" (p. 23)
Cabo Verde	Updated NDC	Agriculture [associated measure]: "Associate agriculture systematically to livestock in order to cycle soil-regenerating nutrients and enhance conditions for the maintenance of livestock, making it more adapted to the new agro-climato-ecological conditions, especially in what refers to heat and water management, cattle feed and the control diseases" (pp. 36–37)
Cambodia	Updated NDC	"Integrating climate change response measures onto the construction design for buildings and for rural housing (use of modern integration of technology)" (p. 120)
Fiji	Updated NDC	"Relocate highly vulnerable communities, and implement the concept of 'build back better'" (p. 5)

Source: Authors' analysis.

4. KEY FINDINGS

Our assessment found that countries have developed more detailed adaptation components in their updated NDCs compared to their first NDCs. They consulted more government agencies and ministries, as well as different stakeholder groups, to develop their adaptation components. A high-level political body also approved most updated NDCs for submission to the UNFCCC. This has helped increase domestic awareness about and commitment to the goals in the updated NDCs. However, more attention to some elements of this assessment framework does not necessarily mean that these elements have been well addressed in the updated NDCs. The framework assesses major trends across the NDCs but cannot make assessments about the quality or adequacy of the different activities to respond to impacts of climate change.

The authors found that the adaptation components of updated NDCs made more references to other national plans and policies and were better aligned with them. Along with an increase in references to the NAP process, many countries' NDCs also refer to their national development plans and climate change policies and include sectoral and subnational plans and policies in relation to advancing adaptation actions. More countries also refer to other international processes, such as the SDGs and the Sendai Framework for Disaster Risk Reduction.

The analysis shows that when countries include impact, risk, and vulnerability information, they use

information from national documents such as the national communications to the UNFCCC. When countries have completed their national communications, they are able to draw on the latest vulnerability and impact information to develop their adaptation NDCs. Other sources of information that countries have used include national-level assessments conducted as part of different adaptation planning, such as the NAP process. This information increasingly reflects the severity of climate impacts that countries are experiencing and the need for more efforts to advance adaptation actions.

The prioritized adaptation actions in the first and updated NDCs cover all the systems that the Global Commission on Adaptation identified as being critical for adaptation. Compared to the first NDCs, the updated NDCs have more prioritized actions related to critical systems such as water, food and nutrition security, and advancing nature-based solutions. Other critical systems, such as infrastructure, cities and urban areas, human health, adaptation finance, and locally led adaptation, also receive more attention in the updated NDCs (see Figure 4). Although most of the assessed countries have increased the number of prioritized adaptation actions in their updated NDCs, a few countries actually have fewer priorities than in their first NDCs.

Only a few prioritized adaptation actions include baselines, targets, indicators, and costs. The number of updated NDCs including indicator frameworks and targets for the actions has increased, though the numbers are

still low. The information on costs, in particular, seems limited because countries are not clear on the calculation methods they use. References to integrating climate adaptation into national budgets are also limited. This suggests that countries need to do more work to develop costing methodologies and align them with other ongoing initiatives to integrate climate change risks into their national budgets in order to develop robust cost estimates. These are important elements of creating realistic and feasible NDC implementation and investment plans.

The number of countries including information on their adaptation MEL activities has increased but remains low. Some countries also detail how they will track the implementation and financing of their NDCs and communicate that information to the UNFCCC. Countries will need to coordinate and align these two activities as implementation of the adaptation component of the NDCs gathers pace.

The updated NDCs reflect improvements in the integration of gender equality as well as the integration of local knowledge and indigenous concerns. Many more countries now include equal participation and influence in decision-making by women and men, and allocation of resources and benefits addresses gender inequality as part of adaptation plans. Indigenous groups are referred to in more NDCs, but the analysis shows that many countries did not conduct consultations with indigenous and local groups during the development of the adaptation NDC. However, other national adaptation planning processes may have facilitated participation of diverse groups.

Many countries are still not clear about how to design actions to contend with losses and damages. Some countries have reported economic losses and damages from past climate disasters. A few countries have mentioned noneconomic costs, slow-onset events, and efforts to address migration and displacements as a result of climate change in their updated NDCs. Comprehensive management of climate impacts and risks (involving averting, minimizing, and addressing losses and damages) by improving early warning systems, increasing access to insurance, and better integrating climate change into disaster risk management practices seem like promising ways to incorporate the issue.

Countries have not planned for transformative adaptations that change underlying system dynamics and respond to increasing shocks and stresses from climate

change. The authors were able to identify actions that addressed some elements of transformative adaptation, such as scaling adaptation actions and addressing underlying system properties, incorporating innovations, and shifting the location of actions in response to climate change. However, countries need to clarify how they can achieve transformative adaptation. Moreover, there were no strong links between inclusion of potentially transformative actions in a country's NDC with the ways to avert, minimize, and address losses and damages from the adverse impacts of climate change.

5. REFLECTIONS FOR FURTHER ACTION

Based on the findings from our assessment, we propose the following actions for consideration by country governments, bilateral and multilateral donors, and the UNFCCC with regard to the adaptation components of NDCs.

For Country Governments

- Though different countries will take different approaches, they should consider the adaptation component of their NDCs as part of a wider suite of harmonized instruments for advancing adaptation action at the national level. Instead of viewing the adaptation NDC as a stand-alone or parallel planning document, countries should strengthen its links with other plans and processes. Improved links with the NAP process, which is a much more comprehensive planning instrument, could help countries advance implementation. The adaptation NDCs, together with the adaptation communications, could provide more international visibility for adaptation.
- Countries can develop the adaptation component of their NDCs in line with their needs and priorities. However, they should ensure that the adaptation NDCs are strategically aligned with other adaptation instruments of the Paris Agreement (Dale et al. 2020). Attempts at such strategic alignment can help determine how best to structure the adaptation NDC and identify the type of information necessary to enable implementation at the scale and speed required. Countries can already consider how to include adaptation as part of the ETF and consider how ongoing adaptation MEL efforts can support the development of adaptation NDC implementation tracking as part of the Paris Agreement.

- Countries should consider engaging a wide variety of stakeholders during the development of the adaptation NDCs, including local and indigenous groups, women, youth, and the elderly. Inclusion of such groups could help make the priorities more inclusive and focused on reducing vulnerabilities.

For Bilateral and Multilateral Donors

- The NDC priorities could influence the development of donor country strategies. Compared to other critical systems, the number of actions under cities and urban areas, locally led adaptation, adaptation financing, and human health is low in both the first and updated NDCs. This suggests that in addition to investments in high-profile sectors such as food and nutrition security, nature-based solutions, and water, donors could consider investing at scale in integrating climate adaptation into less traditional climate adaptation sectors as well.
- Under the Paris Agreement, both the ETF and the biennial transparency report's adaptation section (Rai et al. 2019) provide opportunities to link national adaptation MEL systems with systems to track NDC implementation progress. Developing-country governments could benefit from guidance and tools for tracking adaptation NDC implementation and linking it with ongoing national MEL efforts. Donors could consider making investments to link national adaptation MEL systems with national reporting requirements to the Paris Agreement as part of improved transparency and accountability efforts.
- Donors should support developing countries to develop investment and implementation plans for the prioritized adaptation actions in the NDCs. For example, donors could help developing countries to develop and apply country-led and nationally appropriate indicators and baselines as well as cost estimation methods for priority actions. These priorities also should be integrated into ongoing national development and adaptation planning processes such as the NAP.
- As climate change impacts intensify, donors should help national governments improve their comprehensive risk management approaches for addressing climate change-related losses and damages. This could include supporting the integration of climate risks into disaster risk reduction and management activities, supporting the establishment of early warning systems for multiple hazards, and promoting risk transfer

mechanism such as insurance. Donors could also support the use of different climate scenarios to calculate noneconomic and economic losses and damages.

- Identifying pathways—the sequence of flexible actions—to create transformative adaptation actions across many sectors, identifying ways to improve innovations, and linking such approaches to long-term plans and strategies will become critical as countries strengthen resilience (Carter et al. 2018). Donors can play an important role in funding country-level research to catalyze conversations and build the capacity of national institutions to drive this agenda. Countries lack an agreed definition of *transformative adaptation*, which is a barrier that improved support could help overcome.

For the UNFCCC

- The Paris Agreement has a growing number of instruments for reporting and communicating information about adaptation, such as adaptation communications, NDCs, NAPs, biennial transparency reports, and national communications. However, the kind of information that should be included in each of these instruments remains unclear. The Adaptation Committee is already developing supplementary guidance, mapping out the information needs of the adaptation communications. At the same time, this guidance could map out the information needs of the other instruments and provide guidance on the links between them. This work could help countries to structure their information for different adaptation instruments and remove duplication. Ultimately, countries need to decide for themselves how they see the different instruments. The secretariat could facilitate this decision by providing examples of how different countries have approached and structured different instruments.
- As countries enhance their NDCs, the regular annual synthesis reports of NDCs by the secretariat (paragraph 30 of Decision 1/CMA.3) provides an opportunity to update the information on adaptation and thereby indicate what has changed since the previous round of NDCs. If possible, the secretariat could consider displaying the information from the adaptation component of the NDCs, enabling wider outreach and learning. By promoting transparent and easy-to-update information through an accessible platform, the secretariat could provide crucial support to increase adaptation ambition.

6. CONCLUSION

Countries are at different stages of adaptation planning and implementation. Yet a majority of them have included an adaptation component in their NDCs, which is evidence that adaptation is an important area of focus, on par with mitigation. The work program on the Global Goal on Adaptation in Glasgow has also raised the need for all countries to consider adaptation (UNFCCC 2021c).

Most countries have used their NDCs to communicate a list of prioritized adaptation actions in line with their needs and capacities. The NAP process has influenced the articulation of these adaptation priorities in many countries. Even when there is no final NAP document, the NAP process includes many activities that can help advance adaptation action.

Because countries have flexibility in deciding how to include adaptation in their NDCs, the adaptation information they include is of different types and different scales. Each country presents adaptation information based on its own needs and concerns through its NDC. The Paris Agreement provides little guidance to countries on how to structure the adaptation component, in contrast to mitigation. This creates difficulties in conducting cross-country comparisons of the adaptation components of the NDCs.

Although countries have made significant progress in adaptation planning and implementation, there are areas that need additional work. More work is required to ensure that adaptation priorities are investment and implementation ready. This is critical for raising finance and addressing implementation capacity gaps. Countries will also need to decide how they will track the implementation of the adaptation components of the NDCs. This will require developing-country governments to develop timelines, baselines, indicators, and costs for the prioritized adaptation actions as well as to align national-level monitoring and evaluation activities with NDC implementation tracking. Donors can target resources to help developing-country governments undertake or strengthen these processes.

Countries may not wish to overload the NDCs with all the elements of adaptation that are needed for a comprehensive response, such as that taken in NAPs and national plans and budgets. The NDCs should reflect and provide strategic priorities on adaptation, and the NAP and other instruments may be used to implement the adaptation NDCs.

APPENDIX A: METHODOLOGY FOR TRACKING AND ASSESSING THE ADAPTATION COMPONENTS OF UPDATED NDCS

Assessment Methodology

The research was based on the textual analysis of NDC documents submitted by governments to the UNFCCC, made available in the NDC registry on a rolling basis (UNFCCC 2021b). A total of 86 first NDCs and 86 updated NDCs, and nine NAP documents, submitted to the UNFCCC NAP Central, were also analyzed (UNFCCC n.d.).

An assessment tool was developed in Microsoft Excel, and a team of five coders completed the coding of the NDCs. A few initial NDCs were double coded in a pilot run of the tool to ensure standardization and consistency. Based on the results of this pilot assessment, the tool kit was revised in content and structure. Once the revised tool kit was finalized, coders single coded each document. One of the coders spoke Spanish and translated the documents that were in Spanish and did not have formal English translations. All coded documents were reviewed once by an external consultant and then finalized. All the data from this assessment are available in WRI's Climate Watch platform at www.climatewatchdata.org.

The assessment framework included four distinct modules to answer questions related to specific indicators. These components were merged during the tool redesign to ease coding. The final framework tool had two sheets: one to answer adaptation-related questions from the NDCs and a second sheet to code the adaptation priorities in the NDCs.

The framework starts out with a few general questions related to identifying the coder, the type of document coded, the presence of an adaptation component, and links to adaptation communications. The rest of the framework consists of the following components.

Component 1: Elements of Adaptation Communications

The UNFCCC has provided no guidance to Parties on how to structure the adaptation component of the NDCs. The closest such guidance is one produced during COP24 (2018) for the development of adaptation communications. This guidance was used as the first step for the analysis of the NDCs. WRI's *Enhancing NDCs: A Guide to Strengthening National Climate Plans by 2020* report included a table of additional questions to ask related to this guidance (Fransen et al. 2019). This table was further modified to develop questions for this assessment.

The full list of questions and subquestions that were derived from the guidance and from WRI's *Enhancing NDCs* report is presented below in Table A1. The last column also includes instructions to coders on what to look for in each question.

Table A1 | Elements of an Adaptation Communication

CATEGORY	MAIN QUESTION	SUBQUESTION	INSTRUCTIONS
National circumstances, institutional arrangements, and legal frameworks	Does the nationally determined contribution (NDC) describe the adaptation planning process and the NDC development planning process?	Description of the planning process for NDC development	<i>Institution leading the NDC development, stakeholders involved (civil society organization, private sector, academia, technical bodies), timeline</i>
		Description of the planning process for adaptation planning	<i>Institution leading the adaptation planning, stakeholders involved (civil society organizations, private sector, academia, technical bodies), timeline, multistakeholder processes, primarily aligned with the NDC development process</i>
	Is there a description of institutional arrangements to enhance coordination (sectors, other processes, national development, etc.), planning, and implementation?	Description of coordination process for adaptation planning	<i>Lead body identified for coordinating adaptation planning, evidence of vertical coordination (national to local), evidence of horizontal coordination (across sectors and ministries); this question is looking at how they set up the institutional structure to set up the national plan</i>
		Description of coordination process with other development or climate change processes	<i>Lead body identified for coordinating other processes, evidence of alignment of adaptation planning with other processes (explicit links to other national or sectoral development plans, policies, and programs)</i>

Table A1 | Elements of an Adaptation Communication (Cont.)

CATEGORY	MAIN QUESTION	SUBQUESTION	INSTRUCTIONS
Impacts, risks, and vulnerabilities	Does the NDC include short-, medium-, and long-term trends for changes in the climate?	Short- and/or medium-term trends in climate change	<i>2030–50: Temperature (hot and cold days, high temperature), precipitation (rainfall), sea level rise, extreme events, other impacts (floods and droughts); they may note differences in regions/geographic areas</i>
		Long-term trends in climate change	<i>2100 and beyond: Temperature (hot and cold days, high temperature), precipitation (rainfall and drought), sea level rise, extreme events, other impacts (floods and droughts); they may note differences in regions/geographic areas</i>
	Does the NDC include information about the impact of climate change on specific sectors/systems?	Physical climate change impacts on sectors/ systems	<i>If the NDC provides own sectoral categorizations, use ones in NDC; if this is unclear, use the 15 Climate Watch (CW) sectors from Annex 1 to present physical sectoral climate impacts</i>
		Vulnerabilities and risks for specific population groups	<i>Look for references to groups such as children, elderly, poor, rural small-scale farmers, informal laborers, etc.</i>
National adaptation priorities, strategies, policies, plans, goals, and actions	Does the NDC articulate a vision or a goal for adaptation?		<i>Include specific language related to the main aim of national adaptation efforts; identify if there is an explicit adaptation goal and if it has a target; if it is unclear, or lacking a clear goal, answer “no”</i>
	Does the NDC identify plans and policies at the national or subnational level relevant for adaptation?	Plans and policies relevant for adaptation at national/ sectoral level	<i>If list of relevant policies is long, use Annex 1 CW economic sectors to categorize plans and policies</i>
		Plans and policies relevant for adaptation at subnational level	<i>If list of relevant policies is long, use CW sectors to categorize plans and policies</i>
	Does the NDC identify adaptation priorities?		<i>Priorities refer to actions, sector plans, discrete actions that a country puts forward as its adaptation commitments</i> <i>If “yes,” fill out Component 2; if an NDC only lists priority sectors, without much detail, still fill out “yes” and code it in Component 2</i>
	Does the NDC identify targets for adaptation that are not directly linked to adaptation priorities?		<i>Targets or indicators refer to specific end goals that countries want to achieve with adaptation actions; only answer this question “yes” if identified targets are not directly linked to priorities and not included in Component 2</i>
Implementation and support needs of, and provision of support to, developing-country parties	Does the NDC identify financial needs for implementing identified adaptation priorities?	Total unconditional financial needs for adaptation	<i>Unconditional here implies that the country would implement actions regardless of availability of financial resources</i> <i>If an NDC has adaptation component, but only has financial figures for both adaptation and mitigation and does not identify adaptation-specific numbers, do not include general funding figures here</i>
		Total conditional financial needs for adaptation	<i>Conditional implies a country would only implement these actions in the event of finances available for them; if costs are high and it is unclear that they are unconditional, assume that country will require additional/external financing</i>
	Does the NDC identify other nonfinancial support needs?		<i>Technology transfer, data/information provision, capacity building (specify for whom), other</i> <i>These should be specific needs identified in addition to financial resources for improving adaptive capacity</i>

Table A1 | Elements of an Adaptation Communication (Cont.)

CATEGORY	MAIN QUESTION	SUBQUESTION	INSTRUCTIONS
Implementation of adaptation actions and plans	Does the NDC provide details on past planning milestones, outputs, and investments made and planned?	Past planning milestones	<i>List any advances reported by countries on adaptation planning; these could include national policies, national plans, sectoral plans, subnational plans, etc.</i> <i>This should be more general—what countries have done in terms of outputs, money spending, etc.</i>
		Outputs of adaptation actions	<i>Include results from implementation of adaptation activities; this question is not looking for high-level impacts but for results (outputs) from activities</i>
		Adaptation investments made	<i>Include any specific investments made for adaptation listed by country as already made in the NDC</i>
	Does the NDC provide details on adaptation efforts achieved to date for recognition?		<i>List specific activities the country has identified that they are proud of and want to showcase at the international level</i> <i>Only include if NDC mentions specific achievements related to adaptation activities implemented</i>
	Does the NDC provide details on national, regional, and international cooperation on enhancing adaptation, as appropriate?		<i>If “yes,” identify mentions of shared database and knowledge platforms, participating in regional or international networks, transboundary plans, or initiatives</i>
	Does the NDC identify barriers, challenges, and gaps related to implementation of adaptation?	Lack of climate and risk information, data, and knowledge	<i>These questions are general discussions about barriers/challenges/gaps; ideally they should flow from earlier question 5b (may be similar identifying as a gap but does not ask for specific support)</i>
		Lack of access to technology	<i>Specify details of technology, if available</i>
		Lack of capacity	<i>Specify whose capacity and what kind, if possible</i>
		Lack of financial resources	<i>Specify financial details if they exist</i>
Other barriers		<i>List any other barriers not included above</i>	
Does the NDC identify good practices and lessons learned?	Good practices identified	<i>This answer will need to demonstrate “how to” practice good adaptation, not just about achievements</i>	
	Lessons learned for adaptation implementation and planning	<i>Identify any lessons learned around adaptation planning, implementation, and/or monitoring, evaluation, and learning (MEL) identified in the NDC; include concrete lessons where available</i>	
Does the NDC describe a monitoring and evaluation approach for adaptation?	Institutional set up for MEL of adaptation activities	<i>Identify the institution responsible for overall MEL of adaptation only; link with sectoral agencies, with subnational levels</i>	
	Indicators, metrics, or criteria for MEL	<i>Indicate type of indicators, nature of metrics used, link with targets, etc., for adaptation MEL</i>	
	Alignment with other national MEL systems	<i>Identify references to other national systems for M&E and links; no need to go looking beyond the MEL section to answer this question</i>	

Table A1 | Elements of an Adaptation Communication (Cont.)

CATEGORY	MAIN QUESTION	SUBQUESTION	INSTRUCTIONS
Link with economic diversification plans and mitigation cobenefits	Does the NDC include adaptation actions with mitigation cobenefits?	Emission reduction potential of adaptation actions identified?	<i>If emission reductions are quantified, include here; otherwise, only provide simple detail on activity identified</i>
		Are above adaptation actions accounted for in mitigation section?	<i>May need to look at mitigation section to check that adaptation actions with identified quantified emission reductions are accounted for; only include evidence/ say "yes" if the adaptation actions in component 2 or in 7a.i are specifically accounted for in the mitigation section</i>
	Does the NDC include economic diversification plans with links to mitigation and adaptation?		<p><i>Economic diversification is the process of shifting an economy away from a single income source toward multiple sources from a growing range of sectors and markets; it is mostly relevant for oil-rich states in the context of the United Nations Framework Convention on Climate Change (UNFCCC) negotiations</i></p> <p><i>In the context of climate change adaptation, it takes on a new relevance as a strategy to diversify away from vulnerable products, markets, and jobs toward income sources that are low emissions and more climate resilient; however, if economic diversification is identified in the context of resilience building of rural livelihoods, it should not be included here; if anything in NDC on economic diversification to biodiversity, it should not be in this answer</i></p>
Contribution to other international frameworks and/or conventions	Does the NDC include references to other international frameworks and/or conventions in the adaptation component?		<p><i>Look for references to international frameworks or conventions outside of the UNFCCC; the major ones include the Sustainable Development Goals (include specific ones if provided), Sendai Framework for Disaster Risk Reduction, Convention on Biological Diversity, and Convention to Combat Desertification</i></p> <p><i>Please identify all international frameworks that have been mentioned (we are only interested in multilateral global conventions, and only those a country has identified as being relevant for adaptation); identify convention and list page numbers (no need to copy quotes)</i></p>

Table A1 | **Elements of an Adaptation Communication (Cont.)**

CATEGORY	MAIN QUESTION	SUBQUESTION	INSTRUCTIONS
Gender-responsive adaptation action and traditional knowledge, knowledge of indigenous peoples, and local knowledge systems related to adaptation	Does the NDC include information on how gender has been/ will be mainstreamed into planning and implementation?	Addresses gender differences in adaptation needs, opportunities, and capacities	<i>May need to look at adaptation priorities to check how gender differences have been addressed</i>
		Addresses equitable participation and influence by women and men in decision-making	<i>May need to look at adaptation priorities to check how participation issues have been addressed</i>
		Recognizes that financial resources and other benefits resulting from adaptation investments should be equally distributed between women and men	<i>Look for discussions of equal distribution of benefits from adaptation investments between men and women</i>
		Inclusion of gender equality and women's empowerment in adaptation MEL system, including sex-disaggregated data collection	<i>It may be necessary to look at the adaptation MEL section to assess this question</i> <i>Identify if gender is mainstreamed in the MEL framework, if there are gender-relevant indicators, and if data collection is sex disaggregated</i>
	Does the NDC include reference to the inclusion of indigenous and local communities and/or their knowledge?	Does the NDC support increased indigenous rights, agency, and governance systems?	<i>Any reference to indigenous people/communities/organizations or ethnic minorities</i>
		Are local knowledge and technologies that preserve culture and indigenous knowledge systems referenced in the NDC?	<i>Specific reference to local and indigenous knowledge systems</i>
		Are rights to self-determination and to free, prior, and informed consent (FPIC) for indigenous peoples preserved in the NDC?	<i>FPIC and consultation</i>

Component 2: Critical Systems and Sectors in Adaptation Priorities

Building off the questions above, the priorities communicated in the updated NDCs were reviewed against the action tracks from the Global Commission on Adaptation to assess their comprehensiveness and alignment. An early decision was taken to develop the methodology to check alignment with the core *Adapt Now* report's critical systems, not the overarching revolutions in understanding, planning, and financing, as articulated in the *Adapt Now* report. This assumed that most of the adaptation priorities in the NDCs would be action oriented and along sectoral lines. Human health and locally led adaptation were two additional elements added to final *Adapt Now* critical system categories. Each critical system has several subcomponents that are critical to reaching success around increasing resilience and adaptive capacities. Each adaptation priority could be coded a total of three times in the assessment tool. This was because there was wide variation in how the priorities were articulated. Whereas some were specific, others were broad and included multiple sectors in the same priority. An "other" category was added to each subcomponent and the systems to capture anything that could not be coded under these categories (Table A2).

An analysis compared the existing methodology and adaptation assessment in Climate Watch to the new approach. This assessment revealed that although the new methodology included more information, it could be beneficial to code the adaptation priorities along the older Climate Watch economic sectors. Thus, along with coding the adaptation priorities in the NDCs along the critical systems, they were also coded along the sectoral categories used by Climate Watch using World Bank's economic sector categorization. The full list of sectors that were used can be found in Table A3. Each adaptation priority could be coded for a total of three times for these sectors as well.

There was wide variation in how countries were articulating their priorities in the NDC documents. Whereas some actions were specific and action oriented, others were broad and included actions in different sectors in the same priority. Categorizing each action many times helped to capture how they mapped across the critical sectors despite such variation.

Table A2 | **Critical Systems and Their Subcomponents for Adaptation**

CRITICAL SYSTEMS	SUBCOMPONENTS
Food and nutrition security	<ul style="list-style-type: none"> ▪ Improve smallholder productivity ▪ Help small-scale producers manage risks from increased variability and climate shocks ▪ Address the challenges of the most climate affected and vulnerable ▪ Achieve policy coherence by making agriculture interventions climate smart ▪ Other
Nature-based solutions	<ul style="list-style-type: none"> ▪ Raise understanding of the value of nature for climate adaptation ▪ Embed nature-based solutions into adaptation planning and policy ▪ Increase investment in nature-based solutions ▪ Other
Water	<ul style="list-style-type: none"> ▪ Harness the power of nature and expand water infrastructure ▪ Cope with water scarcity by using water more productively ▪ Prepare for a changing climate by planning for floods and droughts ▪ Improve water governance and scale up financing ▪ Other
Cities and urban areas	<ul style="list-style-type: none"> ▪ Mainstream information on climate risks in the planning and delivery of urban services while strengthening local capacity ▪ Harness the power of nature to respond to both water and heat risks ▪ Build climate resilience by upgrading living conditions in vulnerable communities and informal settlements, drawing on community knowledge ▪ Increase climate-resilient investments and capture value from adaptation benefits ▪ Other
Infrastructure	<ul style="list-style-type: none"> ▪ Undertake inclusive and climate-informed planning for new and existing infrastructure ▪ Mandate climate-resilient design ▪ Mobilize private sector investment in resilient infrastructure ▪ Prepare financing to minimize disruption when infrastructure damage occurs ▪ Other

Table A2 | **Critical Systems and Their Subcomponents for Adaptation (Cont.)**

CRITICAL SYSTEMS	SUBCOMPONENTS
Disaster risk management	<ul style="list-style-type: none"> Reduce long-term vulnerability and exposure Boost efforts to warn, respond, and protect Increase capacities to absorb and recover from extreme events Other
Financing adaptation	<ul style="list-style-type: none"> Shift how investment decisions get made Scale up and deploy public finance more effectively Scale contingent finance and insurance Harness private capital for resilience Other
Human health	<ul style="list-style-type: none"> Increase investments in climate change and health (research, health adaptation for population health, and health system resilience) Mainstream climate risks in health policies and programs, including on health infrastructure, and health systems Include vulnerable communities and people and indigenous populations in the design of health adaptation plans, programs, and policies Develop new technologies for health adaptation (vaccines, data, artificial intelligence, treatment for heat-related, vector-borne diseases) Other
Locally led adaptation	<ul style="list-style-type: none"> Include diverse groups in decision-making at all levels, such as the design and implementation of adaptation activities Use local knowledge and build local capacities Devolve decision-making to the lowest appropriate level Other
Other	<ul style="list-style-type: none"> Other

Note: These systems were identified in the Global Commission on Adaptation's *Adapt Now* report (Bapna et al. 2019).

Table A3 | **Economic Sectors Relevant for Adaptation**

AGRICULTURE	<ul style="list-style-type: none"> General agriculture Fisheries and aquaculture Food security Crops Livestock 	<ul style="list-style-type: none"> Agroforestry Irrigation Agro-ecology Land and soil management Climate smart agriculture
COASTAL ZONE	<ul style="list-style-type: none"> General coastal zone Sea level risk protection Mangroves 	<ul style="list-style-type: none"> Fisheries Coastal management
CROSS-CUTTING AREA	<ul style="list-style-type: none"> Capacity building and knowledge transfer Landscape management 	<ul style="list-style-type: none"> Climate services Climate risk management
DISASTER RISK MANAGEMENT	<ul style="list-style-type: none"> General disaster risk management Disaster preparedness Disaster relief and recovery 	<ul style="list-style-type: none"> Early warning system Monitoring and evaluation system
ECONOMY WIDE	<ul style="list-style-type: none"> General economy wide 	
EDUCATION	<ul style="list-style-type: none"> General education 	

Table A3 | **Economic Sectors Relevant for Adaptation (Cont.)**

ENERGY	<ul style="list-style-type: none"> ▪ General energy ▪ Renewable energy ▪ Renewable solar ▪ Renewable wind ▪ Renewable hydro ▪ Renewable geothermal ▪ Renewable water 	<ul style="list-style-type: none"> ▪ Biomass energy ▪ Energy access ▪ Energy efficiency ▪ Power system planning (PSP) ▪ PSP: transmission lines ▪ PSP: distribution lines ▪ PSP: thermal plants
ENVIRONMENT	<ul style="list-style-type: none"> ▪ General environment ▪ Ecosystem and biodiversity ▪ Watershed and river basin management 	<ul style="list-style-type: none"> ▪ Pollution control ▪ Air quality management
HEALTH	<ul style="list-style-type: none"> ▪ General health ▪ Health services and assessments ▪ Awareness raising and behavior change 	<ul style="list-style-type: none"> ▪ Disease surveillance and control ▪ Malnutrition
LAND USE, LAND-USE CHANGE, AND FORESTRY/FORESTS	<ul style="list-style-type: none"> ▪ General land use, land-use change, and forestry/forests ▪ Wetlands ▪ Land degradation 	<ul style="list-style-type: none"> ▪ Afforestation ▪ Reforestation ▪ Sustainable land management ▪ Sustainable forest management
SOCIAL DEVELOPMENT	<ul style="list-style-type: none"> ▪ General social development ▪ Poverty reduction ▪ Gender 	<ul style="list-style-type: none"> ▪ Safety net ▪ Subsidies
TOURISM	<ul style="list-style-type: none"> ▪ General tourism 	
TRANSPORT	<ul style="list-style-type: none"> ▪ General transport ▪ Infrastructure 	<ul style="list-style-type: none"> ▪ Sustainable transport planning
URBAN	<ul style="list-style-type: none"> ▪ General urban ▪ Buildings 	<ul style="list-style-type: none"> ▪ Waste management ▪ Sustainable urban planning
WATER	<ul style="list-style-type: none"> ▪ General water ▪ Water management ▪ Water conservation and reuse ▪ Water efficiency ▪ Water supply 	<ul style="list-style-type: none"> ▪ Wastewater treatment ▪ Infrastructure ▪ Water quality ▪ Sanitation

Note: Based on World Bank classifications.

Component 3: Losses and Damages

For a number of countries, the adaptation component of their NDCs is also starting to reflect their concerns about losses and damages related to climate change. To better understand how countries were communicating this, the assessment framework attempts to understand both explicit and implicit references to losses and damages. The full list of questions for losses and damages are presented in Table A4 below. Some of these questions ask if a country has explicitly included Loss and Damage in its NDC and has

provided a definition of it; if it presents figures for current and future losses and damages and is transparent about the use of climate scenarios in the presentation of these numbers; if it includes references to displacement and migration, noneconomic losses, comprehensive risk management, and insurance; and if it addresses barriers to addressing losses and damages, including capacity gaps, data gaps, institutional setup, policies and laws, and finance.

Table A4 | **Loss and Damage**

QUESTION	SUBQUESTION	INSTRUCTIONS
Does the nationally determined contribution (NDC) mention losses and damages?		<i>Any mention of losses and damages from climate change in the NDC should get a “yes”</i>
Does the NDC include a definition of <i>Loss and Damage</i> ?		<i>If the NDC includes a definition of Loss and Damage, quote it here</i>
Does the NDC have a description of current and future economic loss and damage?	Current economic loss and damage figure	<i>Identify specific numbers if present; countries may present this information for sectors; mention sectoral break down if relevant; countries could present information by climate impact as well</i>
	Future economic loss and damage figures	<i>Identify specific numbers if present as well the time period; if information is along sectors, mention sectoral break down; if information present is by climate impact, mention loss and damage by hazard</i>
	Use of a climate change scenario when calculating future economic loss and damage	<i>If there is any mention of the use of climate scenarios in assessing future economic loss and damage, mention it here; provide details on the climate scenario used if possible; it may be the case that using different climate change scenarios results in different losses and damages</i>
Does the NDC include noneconomic loss and damage?		<i>Countries may report a wide variety of noneconomic losses; these could include loss of life, health impacts, impacts on human mobility, territory, cultural heritage, indigenous knowledge, biodiversity, ecosystem services, etc.</i>
Does the NDC include descriptions of ongoing and/or prioritized loss and damage initiatives?	Information around slow-onset events	<i>Slow-onset events include sea level rise, increasing temperatures, ocean acidification, glacial retreat and related impacts, salinization, land and forest degradation, loss of biodiversity, and desertification^a</i>
	Information on comprehensive risk management approaches (assessment, reduction, transfer, and retention)	<i>These include the following: emergency preparedness; early warning systems, enhanced recovery and rehabilitation; build back better; insurance; social protection instruments, including social safety nets; and transformational approaches</i> <i>Prioritized adaptation actions may include these even if an NDC does not mention Loss and Damage; in such cases, please identify relevant comprehensive risk management in this question</i> <i>The United Nations Framework Convention on Climate Change (UNFCCC) produced a compendium of comprehensive risk management approaches in 2019 that is a useful review^b</i>
	Information on human mobility, including migration, displacement, and planned relocation	<i>Concerns about human mobility are often central components of loss and damage discussions at the UNFCCC; the Executive Committee of the Warsaw International Mechanism includes a task force and a strategic work program on displacement tasked with developing recommendations for integrated approaches to avert, minimize, and address displacement related to the adverse impacts of climate change</i> <i>List references to mobility, displacement, planned relocation, and migration</i>
	Information on the provision of finance and capacity building for loss and damage	<i>List here if a country is reporting financial figures for Loss and Damage needs, or if the country mentions capacity building needs with respect to Loss and Damage</i>

Sources: a. UNFCCC 2012; b. WIM Excom 2019a.

Component 4: Transformative Adaptation

The Intergovernmental Panel on Climate Change (IPCC) defines *transformative adaptation* as actions “seek[ing] to change the fundamental attributes of systems in response to actual or expected climate and its effects, often at a scale and ambition greater than incremental activities. It includes changes in activities, such as changing livelihoods from cropping to livestock or by migrating to take up a livelihood elsewhere, and also changes in our perceptions and paradigms about the nature of climate change, adaptation, and their relationship to other natural and human systems” (Noble et al. 2014).

WRI’s own work seeks to identify transformative pathways and transformative processes to create the types of change described by the IPCC. A set of simple questions derived from Section 4 of WRI’s paper on transformative adaptation was developed (Carter et al. 2021). Staff from WRI’s Climate Resilience Practice conducted this analysis and provided input for the design of these questions. Past papers on transformative adaptation had already identified a number of adaptation priorities in past NDCs as transformative. These were used to further identify adaptation priorities that could be transformative in both the first and updated NDCs. Table A5 presents the full list of questions that were asked for transformative adaptation.

Table A5 | Transformative Adaptation

QUESTION	SUBQUESTION	INSTRUCTIONS
Does the nationally determined contribution (NDC) include references to <i>transformative adaptation</i> ?		<p>Identify if an NDC includes the term transformative adaptation or transformation in the adaptation component</p> <p>An approach that “seeks to change the fundamental attributes of systems in response to actual or expected climate and its effects, often at a scale and ambition greater than incremental activities”^a</p>
Does the NDC have adaptation priorities that include a significant expansion in scale with a view of changing the underlying system?	Is the expansion over a larger geographic area or an increase in number of people impacted?	<p>Identify if the priority includes an expansion over geographic area or number of impacted</p>
	Does the expansion activity go beyond incremental adaptation to address changes in the overall system?	<p>Transformative adaptation requires a change in the overall system that goes beyond doing business as usual</p> <p>Identify if the adaptation priorities go beyond simple expansion to address changes to the overall system as well</p>
Does the NDC include adaptation priorities with innovation?		<p>Does the priority include a new application of an approach or technology in a particular region or resource system?</p> <p>Look for references to new technologies and methods, etc.</p>
Does the NDC include adaptation priorities that include a shift in location for the adaptation action being implemented?		<p>This could include instances such as farming different crops, shifting from farming to nonfarming livelihoods, use of nature-based solutions in locations that did not have them before, etc.</p>

Source: a. Noble et al. 2014.

APPENDIX B: TABLE OF CODED NDCS AND NAPS

This table presents coded NDC and NAP submissions up until June 30, 2021. First NDCs, updated NDCs, and NAPS were analyzed and coded based on the approved methodology, which captured information related to elements of adaptation communications, losses and damages, and transformative adaptation.

Available at <https://datasets.wri.org/dataset/ndc-adaptation-ambition>.

APPENDIX C: TABLE OF COUNTRIES' ADAPTATION PRIORITIES

This table presents a sectoral breakdown of countries' adaptation priorities, based on the Global Commission on Adaptation's critical systems. Individual priorities were coded with up to three different *Adapt Now* sectors, so the sum of sectoral frequencies may exceed the total adaptation actions for any given document.

Available at <https://datasets.wri.org/dataset/ndc-adaptation-ambition>.

ABBREVIATIONS

COP	Conference of the Parties
CW	Climate Watch
ETF	Enhanced Transparency Framework
FPIC	free, prior, and informed consent
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
L&D	Loss and Damage
MEL	monitoring, evaluation, and learning
NAP	national adaptation plan
NDC	nationally determined contribution
PSP	power system planning
SDG	Sustainable Development Goal
UNFCCC	United Nations Framework Convention on Climate Change
WRI	World Resources Institute

ENDNOTES

1. To conduct the analysis before the end of the donor agreement, the authors determined this cutoff date in order to complete their research within the period of the grant, as outlined within the scope of work. There was a short extension to the cutoff date for three countries—Canada, Ethiopia, and Zambia—that submitted replacements for their updated NDCs in July 2021, shortly after the June 30 cutoff. The authors decided to include these replacements in the analysis over the old updated NDCs, but they stopped doing so after the end of July. However, the authors continued to analyze additional NDCs submitted past the cutoff date, which are available for review on the Climate Watch platform, www.climatewatchdata.org/ndcs-explore?category=adaptation.
2. Based on work by Mechler et al. (2018), we also draw a distinction here to distinguish between the capitalized term Loss and Damage to refer to political debates under the UNFCCC versus lowercase losses and damages to refer to observed impacts and projected risks from climate change.
3. The Intergovernmental Panel on Climate Change (IPCC) defines transformative adaptation as actions “seek[ing] to change the fundamental attributes of systems in response to actual or expected climate and its effects, often at a scale and ambition greater than incremental activities. It includes changes in activities, such as changing livelihoods from cropping to livestock or by migrating to take up a livelihood elsewhere, and also changes in our perceptions and paradigms about the nature of climate change, adaptation, and their relationship to other natural and human systems” (Noble et al. 2014). The authors used the IPCC framework in tandem with previous WRI work on transformative adaptation in the food and nutrition security critical system to create a working definition of transformative adaptation actions based on the IPCC definition. The authors consider actions to be transformative if they seek to create systemic change through an expansion in scale, address changes in the overall system, include innovation, or include a shift in location in response to climate change (Carter et al. 2018). More details on the development of the transformative adaptation component can be found in Appendix A.
4. Based on work by Mechler et al. (2018), we also draw a distinction here to distinguish between the capitalized term Loss and Damage to refer to political debates under the UNFCCC versus lowercase losses and damages to refer to observed impacts and projected risks from climate change.

REFERENCES

- AC (Adaptation Committee). 2021. *Approaches to Reviewing the Overall Progress Made in Achieving the Global Goal on Adaptation*. Bonn, Germany: United Nations Framework Convention on Climate Change. <https://unfccc.int/documents/273844>.
- Addison, S., R. Bharadwaj, and A. Carthy. 2021. “Tackling Loss and Damage: Lessons from Vulnerable Countries.” IIED Briefing Paper. London: International Institute for Environment and Development. <https://pubs.iied.org/20546iied>.
- Bapna, M., C. Brandon, C. Chan, A. Patwardhan, and B. Dickson, eds. 2019. *Adapt Now: A Global Call for Leadership on Climate Resilience*. Washington, DC: World Resources Institute. https://gca.org/wp-content/uploads/2019/09/GlobalCommission_Report_FINAL.pdf.
- CARE (Climate Change and Resilience Information Center). 2020a. “Civil Society Engagement in the NDC Review Process.” Policy Brief. Copenhagen: CARE Denmark. <https://careclimatechange.org/policy-brief-civil-society-engagement-in-the-ndc-review-process/>.
- CARE. 2020b. *Report Card: Where Is Gender Equality in National Climate Plans (NDCS)?* The Hague: Climate Change and Resilience Platform, CARE Netherlands. <https://careclimatechange.org/score-card-ndcs-gender-equality/>.
- Carter, R., T. Ferdinand, and C. Chan. 2018. “Transforming Agriculture for Climate Resilience: A Framework for Systemic Change.” Working Paper. Washington, DC: World Resources Institute. <https://www.wri.org/research/transforming-agriculture-climate-resilience-framework-systemic-change>.
- Carter, R., R. Choularton, T. Ferdinand, H. Ding, N. Ginoya, and P. Preethan. 2021. *Food Systems at Risk: Transformative Adaptation for Long-Term Food Security*. Washington, DC: World Resources Institute. <https://www.wri.org/research/food-systems-risk>.
- Dale, T., L. Christiansen, and H. Neufeldt. 2020. *Reporting Adaptation through the Biennial Transparency Report: A Practical Explanation of the Guidance*. Copenhagen: United Nations Environment Programme–Technical University of Denmark Partnership and Initiative for Climate Action Transparency. https://climateactiontransparency.org/wp-content/uploads/2020/09/Reporting-adaptation-through-the-biennial-transparency-report_an-explanation-of-the-guidance_ICAT_UNEP-DTU-PARTNERSHIP-min.pdf.
- Dazé, A., A. Terton, and M. Maass. 2018. *Alignment to Advance Climate-Resilient Development—Overview Brief 1: Introduction to Alignment*. Winnipeg, Canada: National Adaptation Plan Global Network, International Institute for Sustainable Development. <https://napglobalnetwork.org/wp-content/uploads/2018/08/napgn-en-2018-alignment-to-advance-climate-resilient-development-overview-brief.pdf>.

- Ferdinand, T., S. Tye, D. Gebregziabher, B. Suberi, and R. Carter. 2020. "Driving System Shifts for Climate Resilience: Case Studies of Transformative Adaptation in Bhutan, Ethiopia, and Costa Rica." Working Paper. Washington, DC: World Resources Institute. <https://doi.org/10.46830/wriwp.19.00048>.
- Fransen, T., I. Sato, K. Levin, D. Waskow, D. Rich, S. Ndoko, and J. Teng. 2019. *Enhancing NDCs: A Guide to Strengthening National Climate Plans by 2020*. Washington, DC: World Resources Institute; New York: United Nations Development Programme. <https://www.wri.org/research/enhancing-ndcs-guide-strengthening-national-climate-plans>.
- Hammill, A., J. Dekens, and A. Dazé. 2019. "The National Adaptation Plan (NAP) Process: Frequently Asked Questions." NAP Global Network, December 5. <https://napglobalnetwork.org/2019/12/the-national-adaptation-plan-nap-process-frequently-asked-questions/#page>.
- IPCC (Intergovernmental Panel on Climate Change). 2021. *Climate Change 2021: The Physical Science Basis*. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, edited by V. Masson-Delmotte, P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, et al. Cambridge: Cambridge University Press.
- IUCN (International Union for Conservation of Nature). 2021. *Gender and National Climate Planning: Gender Integration in Revised Nationally Determined Contribution*. Gland, Switzerland: IUCN.
- Mechler, R., L.M. Bouwer, T. Schinko, S. Surminski, and J. Linnerooth-Bayer, eds. 2018. *Loss and Damage from Climate Change: Concepts, Methods and Policy Options*. Cham, Switzerland: Springer.
- NDC Partnership. 2017. *Country Engagement Strategy: A Country-Driven Approach for Collective Impact on Climate and Development Action*. Washington, DC: NDC Partnership. https://ndcpartnership.org/sites/all/themes/ndcp_v2/docs/country-engagement/NDCP_CountryEngStrategy_Final.pdf.
- NDC Partnership. 2020a. "Building Gender-Responsive NDCs." Insight Brief. Washington, DC: NDC Partnership. <https://ndcpartnership.org/sites/default/files/Insight%20Brief%20-%20Building%20Gender%20Responsive%20NDCs%20%28September%202020%29.pdf>.
- NDC Partnership. 2020b. *Adaptation and NDCs: From Analysis and Planning to Action and Ambition Raising*. Washington, DC: NDC Partnership. https://ndcpartnership.org/sites/default/files/Extended_Report-Adaptation_and_NDCs_From_Analysis_and_Planning_to_Action_and_Ambition_Raising_October-2020.pdf.
- NDC Partnership and Vivid Economics. 2021. "NDC Partnership and CAEP Support Analysis." PowerPoint presentation. Washington, DC: NDC Partnership.
- Noble, I.R. 2018. *NAPs: The Best Path to a Long-Term Adaptation Strategy in Developing Countries*. Washington, DC: World Resources Institute. <https://www.wri.org/climate/expert-perspective/naps-best-path-long-term-adaptation-strategy-developing-countries>.
- Noble, I.R., S. Huq, Y.A. Anokhin, J. Carmin, D. Goudou, F.P. Lansigan, B. Osman-Elasha, and A. Villamizar. 2014. "Adaptation Needs and Options." In *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects*. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, edited by C.B. Field, V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, et al. Cambridge: Cambridge University Press. https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap14_FINAL.pdf.
- Patwardhan, A., B. DeNee, S. Singh, J. Richmond, R. Kohli, and J. Teng. Forthcoming. *Characterizing Climate Adaptation within the Paris Agreement Framework: A Content Analysis of NDCs*. College Park: University of Maryland.
- Patel, S., R. Neha, and S. Mclvor. 2021. "LDC NDCs: Adaptation Priorities and Gaps to Address." IIED Briefing Paper. London: International Institute for Environment and Development. <https://pubs.iied.org/17709iied>.
- Rai, N., S. Barry, and N. Brooks. 2019. "Assessing Adaptation Results: Aligning National M&E Systems and Global Results Frameworks." Issue Paper. London: International Institute for Environment and Development. <https://pubs.iied.org/10198iied>.
- Singh, H., S. Harmeling, and S.C. Rai. 2016. *Global Goal on Adaptation: From Concept to Practice*. Johannesburg: ActionAid International; Geneva: CARE International; Gland: WWF International. <https://careclimatechange.org/global-goal-adaptation-concept-practice/>.
- Smithers, R., K. Shabb, E. Holdaway, N.S. Ibrahim, N. Rass, and J. Olivier. 2017. *The Role of the NAP Process in Translating NDC Adaptation Goals into Action: Linking NAP Processes and NDCs*. Bonn, Germany: Deutsche Gesellschaft für Internationale Zusammenarbeit. <https://www.adaptationcommunity.net/wp-content/uploads/2017/10/The-Role-of-the-NAP-Process-in-Translating-NDC-Adaptation-Goals-into-Action.-Linking-NAP-processes-and-NDCs.pdf>.
- UNFCCC (United Nations Framework Convention on Climate Change). 2012. "Synopses Series: Slow Onset Events." Bonn, Germany: UNFCCC. https://unfccc.int/files/adaptation/application/pdf/soe_synopsis.pdf.
- UNFCCC. 2015a. *Paris Agreement*. Paris: UNFCCC.
- UNFCCC. 2015b. "Decision 9/CMA.1." Bonn, Germany: UNFCCC. https://unfccc.int/sites/default/files/resource/9-CMA.1_English.pdf.
- UNFCCC. 2021a. *Nationally Determined Contributions under the Paris Agreement: Synthesis Report by the Secretariat*. Bonn, Germany: UNFCCC. https://unfccc.int/sites/default/files/resource/cma2021_02E.pdf.

UNFCCC. 2021b. *Interim NDC Registry*. Bonn, Germany: UNFCCC. <https://www4.unfccc.int/sites/ndcstaging/Pages/Home.aspx>.

UNFCCC. 2021c. "Decision-/CMA 3: Glasgow–Sharm el-Sheikh Work Programme on the Global Goal on Adaptation." Bonn, Germany: UNFCCC. https://unfccc.int/sites/default/files/resource/cma3_auv_4ac_Global_Goal.pdf.

UNFCCC. n.d. "UNFCCC NAP Central." https://www4.unfccc.int/sites/NAPC/News/Pages/national_adaptation_plans.aspx.

WIM Excom (Executive Committee of the Warsaw International Mechanism for Loss and Damage). 2019a. *Compendium of Comprehensive Risk Management Approaches*. Bonn, Germany: United Nations Framework Convention on Climate Change. https://unfccc.int/sites/default/files/resource/FINAL_AA3_Compendium_September_2019%28revised%29.pdf.

WIM Excom. 2019b. *Five-Year Rolling Workplan of the Executive Committee of the Warsaw International Mechanism for Loss and Damage Associated with Climate Change Impacts*. Bonn, Germany: UNFCCC. <https://unfccc.int/documents/209532>.

ACKNOWLEDGMENTS

WRI acknowledges its institutional strategic partners, which provide core funding to WRI: the Netherlands Ministry of Foreign Affairs, the Royal Danish Ministry of Foreign Affairs, and the Swedish International Development Cooperation.

Funding from the Federal Ministry for Economic Cooperation and Development of Germany (BMZ) as a contribution to the NDC Partnership made this work possible, and we appreciate the ministry's support. We would also like to thank the German Agency for International Cooperation (GIZ), the International Institute for Environment and Development, the NAP Global Network, and Vivid Economics for providing input in this work.

We would like to acknowledge Mengpin Ge and the Climate Program at WRI for facilitating the integration of this working paper's data set onto the Climate Watch data platform.

We would like to thank Natalia Alayza, Talia Chorover, Richard Christel, Matti Goldberg, Charles Iceland, Kalyan Keo, Rohini Kohli, Christian Ledwell, Amanda McKee, Sejal Patel, Jennifer Doherty Bigara Rodriguez, Katie Ross, and David Waskow for their valuable reviews and insights on this paper.

Thank you to Emily Mathews, Carlos Muñoz Piña, Logan Byers, Romain Warnault, Lauri Scherer, Shannon Collins, Rosie Ettenheim, and Shannon Paton for their support in this paper's production.

Finally, we would like to thank Ayesha Dinshaw and Rebecca Carter for making this working paper possible.

ABOUT THE AUTHORS

Aarjan Dixit is a Consultant in the field of climate change, resilience, and international development.

Contact: aarjand@gmail.com

Marcella Kim is a former Research Analyst with the Climate Resilience Practice at WRI. Kim is currently an International Climate Policy and Engagement Coordinator with the U.S. Department of State.

Contact: kim.marcella.j@gmail.com

Ryan O'Connor is a Research Assistant with the Climate Resilience Practice at WRI.

Contact: ryan.oconnor@wri.org

Melaina Dyck is a former Intern on Nature-Based Solutions with the Global Commission on Adaptation at WRI. Dyck is currently an Analyst with Climate Focus.

Contact: m.dyck@climatefocus.com

Gianna Ferrarin is a former Intern on Cities with the Global Commission on Adaptation at WRI. Ferrarin is currently a journalist tracking court filings as a News Assistant at Law360.

Contact: giannamferrarin@gmail.com

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.



Copyright 2022 World Resources Institute. This work is licensed under the Creative Commons Attribution 4.0 International License.
To view a copy of the license, visit <http://creativecommons.org/licenses/by/4.0/>