MAKING THE CASE FOR CLIMATE AND NATURE RESILIENCE INVESTMENTS: THE NEED TO REVISE GROWTH AND DEBT SUSTAINABILITY FRAMEWORKS

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This document sets out ideas and proposals for discussion and improvement. We welcome comments and suggestions. The views expressed in this document are preliminary and subject to revision.

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FOREWORD

The urgency of building resilience to climate and nature-related risks is no longer a matter of debate – it is a matter of survival. For many developing countries, particularly across Africa and among Small Island Developing States (SIDS), the path to resilience is obstructed not by a lack of ambition, but by the weight of unsustainable debt and the rising cost of capital.

These financial constraints are not abstract – they are real, and they are devastating. They limit our ability to invest in the infrastructure, systems, and protections our people need. They force us to choose between servicing debt and safeguarding lives. And all the while, the economic toll of climate-related disasters continues to rise.

The Bridgetown Initiative calls for a fundamental shift: resilience must be integrated into how we define economic growth and fiscal stability. Without this shift, we risk locking ourselves into a cycle of reactive spending, deepening debt, and stalled development.

The data is sobering. In sub-Saharan Africa, more than half of countries now face public debt levels exceeding 60% of GDP. Climate-related disasters are projected to cost the global economy $145 billion in insured losses this year alone. These are not isolated events – they are systemic shocks that disrupt food systems, reduce revenues, and increase borrowing costs.

SIDS face a similar dilemma. Between 2013 and 2022, we collectively spent over $46 billion on debt servicing, while receiving just $1.5 billion in international climate finance. And more than 60% of that finance came in the form of loans – only a small fraction was concessional.

This model is not sustainable. Concessional finance is essential – not only to enable countries to invest in adaptation and protection, but to improve credit profiles, attract private capital, and build long-term economic stability.

This report outlines a practical and necessary path forward. It calls on finance ministries, development institutions, ratings agencies and private sector partners to rethink how we finance resilience and how we measure economic strength. It urges us to adopt tools and frameworks that recognize resilience as a strategic investment – not a fiscal burden.

As we look ahead to COP30 and beyond, the message is clear: resilience must be treated as a central pillar of our strategies for growth and development.

I call on the international community to act with urgency and resolve. To reform the financial architecture. To support countries that are ready to lead. And to ensure that no nation is forced to choose between paying its debts and protecting its people.

The time to act is now. Together, we can turn today's risks into tomorrow's opportunities—and build a future that is fair, secure, and prosperous for all.

The Hon. Mia Amor Mottley S.C., M.P.
Prime Minister of Barbados

EXECUTIVE SUMMARY

Around a dozen emerging market and developing economies (EMDEs) are in debt distress, and nearly 60 more are at risk of this same fate. With rising debt burdens and growing debt service costs, at current interest rates, many EMDEs cannot afford the investments needed for long-term prosperity. Their economic situation is further exacerbated by growing risks from the climate crisis and nature loss, declining official development assistance, and an increasingly precarious tariff environment that threatens export-dependent economies. These pressures combine with volatile financial markets to constrain fiscal space and delay much-needed investments in resilient development.

The costs of the climate crisis and nature loss are mounting. Over the last two decades, V20 countries have lost over $525 billion to extreme weather - equivalent to 20% of their combined gross domestic product (GDP).[1] These losses stem from sudden disasters as well as slower-onset events: hurricanes that destroy infrastructure, droughts that shrink harvests, floods that disrupt supply chains, and coastal erosion that swallows homes and farmland. Nature loss, through deforestation, land degradation, and ecosystem collapse, further undermines economic stability by weakening food and water security and reducing natural protection against climate shocks. It also accelerates climate risks by degrading vital carbon sinks such as forests, wetlands, and oceans. Together, these crises stall growth, erode fiscal space and raise borrowing costs, creating a vicious cycle of vulnerability and underinvestment.

To address the debt crisis, countries must invest to tackle the climate and nature risks that are driving it. Investing in practical risk-reducing measures – like mangrove restoration to buffer storms, infrastructure upgrades to withstand floods, or early warning systems to prevent disaster losses – can make a measurable difference. These investments not only reduce vulnerability but can also boost productivity, create jobs, lower fiscal volatility, and enhance long-term creditworthiness. They are essential for protecting development gains and putting economies on a more stable growth path.

Yet current macrofiscal frameworks fail to reflect the economic returns on resilience investments, as encapsulated in the International Monetary Fund (IMF)–World Bank Debt Sustainability Analysis (DSA) and sovereign credit ratings.[2] These frameworks account for the risks posed by climate and nature shocks by lowering countries' debt carrying capacity or credit rating. But they do not recognize the economic benefits of investments in resilience. As a result, spending on resilience is treated as a fiscal cost or consumptive expenditure, rather than a productive investment that contributes to economic stability in the face of the climate crisis and nature loss.

This asymmetry distorts incentives and puts finance ministries in a bind: countries see their debt sustainability and credit ratings worsen due to rising climate and nature risks, and may need to borrow more to respond to or prevent further shocks – yet macroeconomic practice does not credit investments to lower these risks. Hence, governments are likely to channel scarce fiscal resources into more 'traditional productive investments' such as expanding roads or energy infrastructure.[3] Despite their long-term benefits for economic development, investments in climate and nature resilience – like sea defenses, cliff stabilization, or ecosystem restoration – tend to be deprioritized, leaving countries vulnerable to climate and nature risks.

[1] V20. (2022). Climate Vulnerable Economies Loss Report. Available at: https://www.v-20.org/resources/publications/climate-vulnerable-economies-loss-report.

[2] By macrofiscal frameworks, we mean the intertwined set of national and international tools, such as growth projections, budget planning models, the IMF–World Bank Debt Sustainability Analysis (DSA), and sovereign credit ratings, that shape how fiscal space, risk, and investment decisions are evaluated. The IMF's DSA remains one of the most influential frameworks. Growth projections - on which most of it is based - are critical in determining what is considered fiscally viable.

[3] As distinct from upgrading roads or energy infrastructure to be resilient to climate and nature hazards like hurricanes and floods.

This effect shows up in how countries plan for climate and nature resilience. Many finance ministries are only marginally involved in the development of national resilience investment plans, for example Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs). They may have a role in reviewing these documents, but they are rarely part of the central team developing priorities with a view to their incorporation into medium-term expenditure frameworks. This is reflected in the fact that only around half of EMDEs have provided estimates of the costs of adaptation in their NDCs and NAPs and only around half of these involve detailed estimates.[4] Without strategic and systematic consideration in budget-setting processes, the likelihood of allocating resources to resilience investments – particularly capital intensive ones such as undergrounding power transmission lines – is low, making it difficult to move from paper to practice.

The misalignment of incentives also has implications for countries' ability to access concessional finance for resilience as such resources are more likely to be mobilized for investments that are integrated into credible macrofiscal frameworks. When resilience investments are inadequately considered or excluded, it weakens the case for such finance. More broadly, while increased international concessional finance for resilience is urgently needed, clear and credible country demand is a necessary – but not sufficient – condition for unlocking it. The experience in the health sector illustrates this point: global funding for public health increased in the early 2000s, when EMDE governments shared credible investment strategies that were consistent with IMF-endorsed growth and adjustment strategies.

Of course, demand alone is insufficient. Expanding concessional finance will also require supply-side reforms, which the Bridgetown Initiative and others are actively pursuing. And critically, countries must demonstrate their ability to deliver: access to concessional finance depends not only on the strength of macrofiscal planning, but also on the track record of execution, which also affects a country's credibility in asking for additional resources. However, where this is a robust plan and a legacy of project delivery, countries stand a greater chance of securing funds.

Scaling investment in climate and nature resilience – and unlocking concessional finance to support it – is necessary for long-term, sustainable growth. But success also hinges on prudent fiscal management and institutional effectiveness. At a minimum, this means two things. First, countries need to establish a sustainable fiscal position so that resilience investments have the intended impact on growth. This includes anchoring fiscal policy around a credible long-term debt target and associated primary balance, and integrating resilience investments within this framework. Fiscal discipline is essential: without it, additional financing is not a real solution. Second, countries must address weaknesses in policy frameworks and institutional arrangements. This includes strengthening public investment management to ensure capital expenditure projects are identified on clear evidence and implemented under transparent procurement and competitive bidding processes.

This paper sets out a practical approach to address the asymmetry in macrofiscal frameworks. It shows how the economic benefits of climate and nature resilience investments can be better reflected in standard macrofiscal frameworks – so that they are treated not as consumptive expenditure, but as productive investments that should support higher debt carrying capacity and enhanced creditworthiness. The focus is on adjustments to the IMF-World Bank Debt Sustainability Framework for Low Income Countries (LIC-DSF), where an ongoing review presents a timely opportunity for reform with far-reaching consequences for enabling investments in climate and nature resilience.

[4] UNFCCC Adaptation Committee. (2024). Assessing and meeting the costs of adaptation: Lessons learned and good practices from developing countries. Available at: https://weadapt.org/knowledge-base/economics-of-adaptation/assessing-and-meeting-the-cost-of-adaptation-lessons-learned-and-good-practices-from-developing-countries/?utm_source=chatgpt.com.

A process to integrate climate and nature resilience into macrofiscal frameworks

A four-part process can help finance ministries, with support from other government agencies as well as the IMF and World Bank, to better assess and plan for resilience investments within macrofiscal frameworks:

1. **Understand climate and nature risks, and identify resilience investment needs**
   A first step is to develop a clear picture of a country's exposure to climate and nature risks and the likely macroeconomic impacts of these risks – both acute and chronic. This understanding can then inform an assessment of the investments needed to reduce those risks. To support this assessment, this paper introduces a typology that categorizes resilience investments by risk type and sector, and provides indicative cost estimates. This can help streamline how resilience needs are defined and compared across institutions. From there, countries can tailor the typology to their specific risk profiles and priorities, drawing on existing strategies like NDCs and NAPs.

   This paper focuses here – offering an integrated framework to help countries and their partners understand climate and nature-related macroeconomic risks, identify and organize their resilience needs, and begin to estimate their scale and economic value (see Sections 1 and 2).

2. **Reflect resilience investments into countries' growth projections**
   Once resilience investment needs have been identified, their potential impact on a country's growth trajectory can be assessed. This involves estimating how investments – e.g. in flood defenses, mangrove protection, or early warning systems – could reduce future economic losses, boost productivity, and strengthen overall economic stability. Similar methods are already used to model the growth impacts of physical infrastructure or energy transition investments. Climate-resilient infrastructure offers a practical starting point for developing methodologies to estimate the link between resilience investments and growth.[5]

3. **Integrate expected growth impacts of resilience investments into DSAs**
   Once the expected growth impacts of resilience investments are understood, the next step is to integrate them into countries' DSAs. This can help demonstrate how resilience investments affect a country's debt-carrying capacity - showing that, under the right financing conditions, such investments can be fiscally sustainable and even improve long-term fiscal outlooks. For many countries, implementing resilience strategies will require significant upfront spending. By incorporating the benefits into DSAs, countries can build a stronger case for concessional and long-term finance, and clarify the conditions under which borrowing for resilience supports – rather than undermines - macroeconomic stability.

   In light of the ongoing LIC-DSF review, this paper proposes high-level reforms to both the LIC-DSF and the framework for market access countries, the Sovereign Risk and Debt Sustainability Framework (SRDSF), to ensure the frameworks can help finance ministries understand the financing terms that permit investments in resilience to be macro-feasible (see Section 3).

5 The IMF's Debt-Investment-Growth and Natural Disasters (DIGNAD) toolkit is a good starting point. It enables users to evaluate debt sustainability risks following one-off natural disasters, amidst the need to rebuild public infrastructure. It can be used to analyze the effects of ex-ante policies, including building adaptation infrastructure.

4. **Translate priorities into credible investment and financing plans**
   Once the growth and debt implications of resilience investments are understood, these insights can inform more credible, macro-aligned investment and financing plans. Countries can use this evidence to prioritize the most impactful interventions, identify and advocate for appropriate financing instruments (including grants and concessional finance), and integrate resilience investments into medium-term expenditure frameworks and budget processes. Including resilience investments into financial planning supports improved coordination with development partners on the financing volumes and terms needed to deliver on governments' ambitions and increases the chances of attracting private capital to the table, where appropriate, by providing transparency on plans

How this process can drive access to finance for investments in resilience

This paper provides a practical starting point to better equipping countries and institutions with the framing, data gathering, and analytical approaches needed to make more holistic macrofiscal decisions. In this way, finance ministries can ground resilience investment plans in economic reality – demonstrating their impact on growth, debt dynamics, and financing needs – and, in doing so, provide a stronger basis for engagement with development partners, credit rating agencies, and capital providers. This helps shift the conversation from risk and cost alone to one centred on strategic investment and long-term stability.

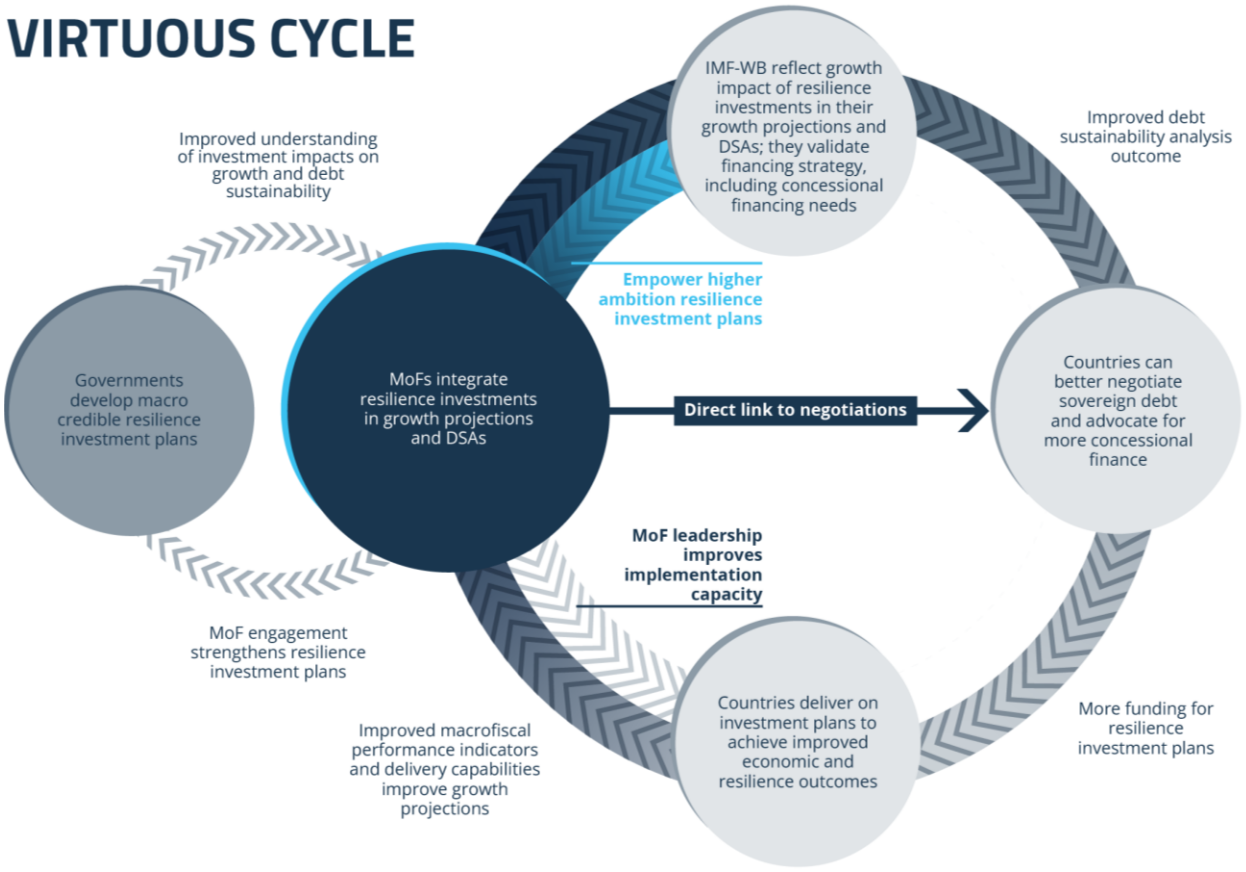
As illustrated in *Figure 1*, this approach can contribute to a virtuous cycle in which better planning and recognition lead to more targeted financing and more effective delivery:

- **Governments draw on macro-credible analysis** to support the development of resilience investment plans that align with growth and fiscal strategies.
- **The IMF and World Bank begin to reflect resilience investments** in their own projections and DSAs, particularly where clear links to macrofiscal outcomes are made.
- **Countries are better placed to engage with funders and market actors**, helping to make the case for concessional or blended finance that supports resilience goals.
- **Stronger recognition and alignment helps improve access to finance**, on terms that reflect the scale, long-term nature, and public-good character of these investments.
- **Resilience investments are delivered** – with stronger engagement of finance and other coordinating ministries – supporting economic and fiscal outcomes that reinforce the case for future investment.

Of course, none of this happens automatically. Progress on any one part of the cycle depends on action by others. Each step is necessary but not sufficient on its own for success. Even if a country demonstrates how resilience investments affect growth and debt trajectories, institutions like the IMF and World Bank may still need to evolve their methodologies to reflect this. Similarly, negotiating for more affordable, longer-term financing requires sound macrofiscal frameworks, but it will only succeed if that capital is made available in sufficient volume and with appropriate degrees of concessionality. And delivering large-scale resilience investments will require strong and long-term political focus, institutional capacity, effective leadership, and close coordination across government and with the private sector to ensure implementation is fast, efficient and effective.

Integrating climate and nature resilience investments into macrofiscal frameworks does not offer a silver bullet. But it is a necessary step to give countries the evidence and tools they need to negotiate finance from a position of greater strength and to chart a path for continued economic growth and prosperity in the face of rising climate and nature risks.

Figure 1: A virtuous cycle to unlock finance for climate and nature resilience



What needs to happen now

To drive this work forward, the Bridgetown Initiative calls for four practical steps - building on momentum from initiatives such as the High-Level Expert Group on Debt, Climate and Nature, NatureFinance FIMA programme, and others working to align climate, nature, and macroeconomic policy.

1. In the lead-up to the IMF-World Bank Spring Meetings 2026, coalitions of finance ministers, such as the Climate Vulnerable Forum/Group of Vulnerable Countries (CVF-V20), G24, and Coalition of Finance Ministers (CoFM), **support country proof-points that demonstrate the macrofiscal benefits of climate and nature resilience investments**.
2. In the lead-up to the IMF-World Bank Annual Meetings 2026, the IMF, World Bank, multilateral development banks (MDBs) and other development partners (with the support of experts) **develop growth methodologies that integrate the benefits of climate and nature resilience investments** and **user-driven tools for debt management offices** to assess the relative growth and debt sustainability impacts of resilience investments more effectively and more efficiently – supporting integration into routine decision-making processes and financing discussions.[6] The IMF, World Bank and other development partners **provide technical assistance facilities** to support countries to undertake this work.

[6] The World Bank is beginning this work including through expansions to its Mitigation, Adaptation and New Technologies Applied General Equilibrium Model (MANAGE) to consider the growth and debt sustainability impacts of nature investments, including in mangroves, crop pollination and soil erosion.

3. As part of the LIC-DSF review process, the IMF and World Bank **revise guidance for DSA frameworks to include the benefits of investments in climate and nature resilience** and **reflect the financing terms that permit these investments to be macro-feasible**. This should start with the inclusion of alternative scenarios to assess climate and nature risks and investments. Insights from these country proof-points should also inform revisions to the DSA framework itself. We propose high-level reforms in Section 3, which will form the basis for Bridgetown Initiative engagement with the IMF and World Bank on this issue.

4. In the lead-up to COP30, climate and nature experts such as the United Nations Environment Programme (UNEP), the International High-level Expert Group (IHLEG), the Network for Greening the Financial System (NGFS), and the Insurance Development Forum (IDF) among others, **help refine the climate and nature risk framework, climate and nature resilience intervention typology and cost estimates** set out in this paper, while also driving alignment with other ongoing initiatives. It will be important to update the cost estimates to cover the full typology of interventions and extend the investment outlook from 2030 to 2035 to provide a clearer picture of medium-term spending needs.

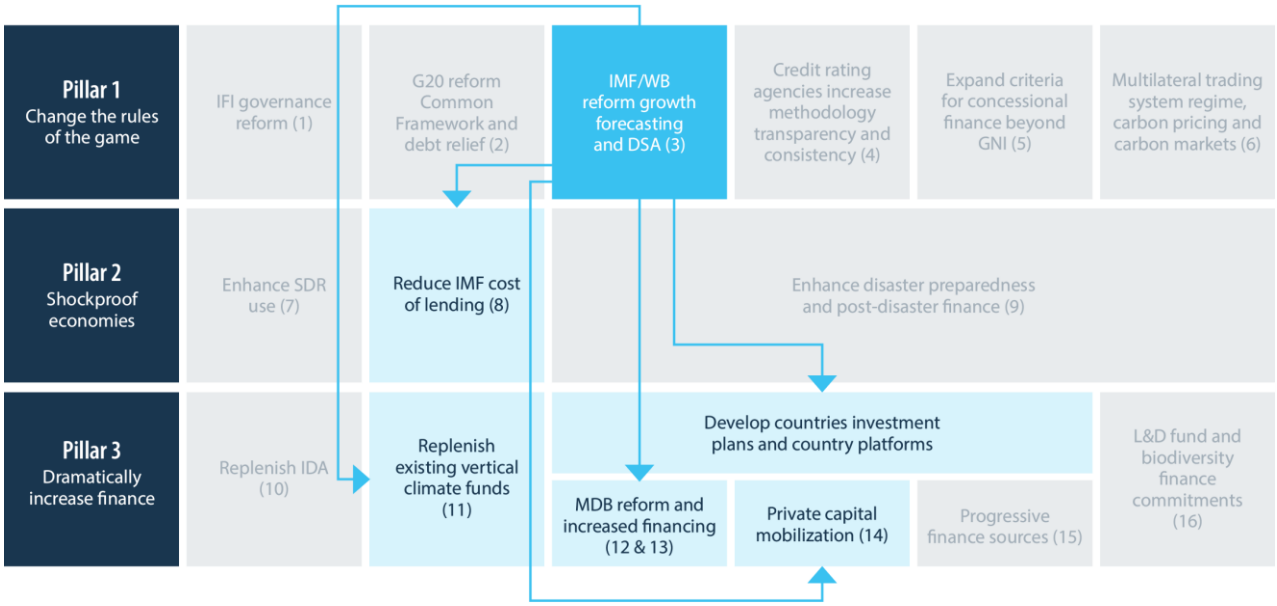
These steps are ambitious but feasible. Critically, we believe that they will help countries to better programme and, ultimately, realize the benefits of greater investments in climate and nature resilience.

About the Bridgetown Initiative

Integrating investments in climate and nature resilience into macrofiscal frameworks and the DSA is one of the elements of **Bridgetown Initiative 3.0** (BI3.0), which calls for more, cheaper, and longer-term financing to facilitate investments particularly in resilience, thereby enhancing economic stability and growth.

This paper speaks explicitly to **Pillar 1, Key Action 3** of BI3.0: The need to reform the IMF/World Bank growth forecasting methodologies and DSA frameworks, and will help drive progress on several other elements of BI3.0 (see Figure 2).

Figure 2: Bridgetown Initiative 3.0 key actions



INTRODUCTION

The debt crisis facing emerging market and developing economies (EMDEs) is deepening. Around a dozen countries are in debt distress, and nearly 60 more are at risk. With rising debt burdens and debt growing service costs, many EMDEs cannot afford the investments needed for long-term prosperity. Their economic situation is further exacerbated by growing risks from the climate crisis and nature loss, declining official development assistance, and an increasingly precarious tariff environment that threatens export-dependent economies. These pressures combine with volatile financial markets to constrain fiscal space and delay much-needed investments in resilient development.

The costs of climate change and nature loss are mounting, including the rapid increase in natural disasters and slower-onset events like coastal erosion:

- The total economic loss in Thailand from widespread damage to manufacturing industries during severe flooding in 2011 was estimated at 12.6% of gross domestic product (GDP), and the country's growth declined by 1.1% from pre-flood projections.[7] Due to supply chain linkages, world industrial growth declined by about 2.5% as a direct result of the floods.
- In 2015, Tropical Storm Erika struck Dominica, unleashing torrential rains that led to flooding and landslides and caused extensive damage to the island's infrastructure, including roads, bridges, and housing, as well as to the agriculture sector. The total damage and losses were estimated at US$483 million, equivalent to 90% of the country's GDP. In 2017, Dominica was struck again, this time by Category 5 Hurricane Maria, which wiped out 90% of crops, livestock and homes, resulting in an unprecedented 226% in losses and damages.[8]
- In 2022, Pakistan experienced heavy rains and unprecedented glacier melting, which resulted in catastrophic flooding that wiped out critical infrastructure, crops and livestock. The disaster killed 1,700 people, left tens of millions internally displaced, and caused US$14.9 billion in damage to capital stocks, equivalent to 4.8% of the country's GDP.[9]
- The combined impact of changing weather patterns and deforestation are driving massive shifts in the hydrological cycle, which could make large parts of Brazil unfit for agriculture.[10]

[7] World Bank. (2011). Thai Flood 2011: Rapid Assessment for Resilient Recovery and Reconstruction Planning. Available at: https://documents1.worldbank.org/curated/en/677841468335414861/pdf/698220WP0v10P106011020120Box370022B.pdf
[8] World Bank. (2015). Dominica: Rapid Damage and Needs Assessment Following Tropical Storm Erika. Available at: https://documents1.worldbank.org/curated/en/142861467995411564/pdf/104251-WP-PUBLIC-Rapid-Damage-and-Needs-Assessment-Final-Report-Oct5.pdf; World Bank. (2017) Dominica: Hurricane Maria Post Disaster Assessment and Support to Recovery Planning. Available at: https://www.gfdrr.org/en/dominica-hurricane-maria-post-disaster-assessment-and-support-recovery-planning
[9] World Bank. (2022). Pakistan: Flood Damages and Economic Losses Over US$30 Billion and Reconstruction Needs Over US$16 Billion. World Bank. Available at: https://www.worldbank.org/en/news/press-release/2022/10/28/pakistan-flood-damages-and-economic-losses-over-usd-30-billion-and-reconstruction-needs-over-usd-16-billion-new-assessme
[10] Mazzucato, M. (2024). Economics of Water: Valuing the Hydrological Cycle as a Global Common Good. UCL Institute for Innovation and Public Purpose. Available at: https://www.ucl.ac.uk/bartlett/public-purpose/publications/2024/oct/economics-water-valuing-hydrological-cycle-global-common-good

Nature as infrastructure

From an economic standpoint, nature can be thought of like other forms of infrastructure. Nature is an asset that provides long-term services – known as ecosystem services – such as clean air, stable water supply, fertile soil, storm protection through mangroves and seagrass meadows, and carbon capture through oceans and forests. Just as with physical infrastructure, these services are fundamental to economic activity and human wellbeing. However, the natural capital base is being severely degraded. It requires operations and maintenance expenditures (O&M) to sustain these services. Currently, with O&M expenditures insufficient and the benefits of sustaining the "infrastructure" not considered, natural capital is being destroyed. Without ongoing investment to maintain "green" infrastructure, countries may be forced to rely on costly "grey" infrastructure – for example, building water treatment plants instead of protecting upstream watersheds. Methods exist to model the growth impacts of physical infrastructure, and these should be expanded to natural capital.

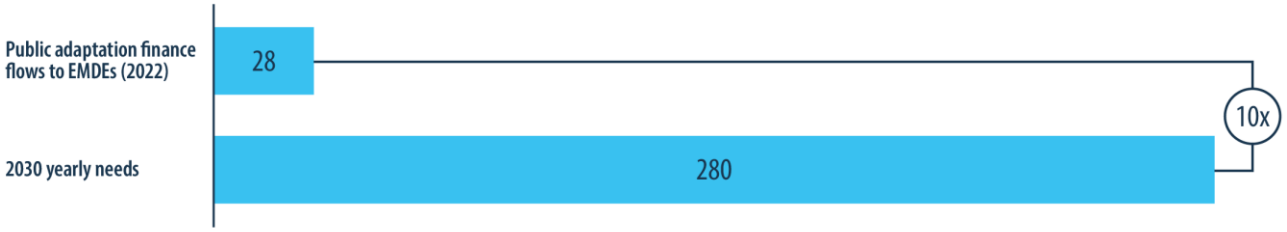
To address the debt crisis, countries must invest to tackle the climate and nature risks that are driving it. Investing in practical risk-reducing measures - like mangrove restoration to buffer storms, infrastructure upgrades to withstand floods, or early warning systems to prevent disaster losses - can make a measurable difference. These investments not only reduce vulnerability but can also boost productivity, create jobs, lower fiscal volatility, and enhance long-term creditworthiness. They are essential for protecting development gains and putting economies on a more stable growth path.

Yet current macrofiscal frameworks fail to reflect the economic returns on resilience investments. They account for the risks posed by climate and nature shocks by lowering countries' debt carrying capacity or credit rating. But these frameworks do not recognize the economic benefits of investments in resilience. As a result of this asymmetry, resilience investments are treated as fiscal costs or consumptive expenditure rather than as productive investments that contribute to growth and economic stability in the face of climate change and nature risks.

This asymmetry distorts incentives and puts finance ministries in a bind: countries see their debt sustainability and credit ratings worsen due to rising climate and nature risks, and may need to borrow more to respond to those shocks – yet macroeconomic practice does not credit investments to lower these risks. As a result, governments are likely to channel scarce fiscal resources into more traditional capital investments that are commonly considered 'productive', such as expanding roads or energy infrastructure. Despite their long-term benefits for economic development, investments in climate and nature resilience – like sea defenses, cliff stabilization, or ecosystem restoration – tend to be deprioritized, leaving countries' more vulnerable to climate and nature risks. Indeed, across EMDEs, investments in resilience are far below what is needed and estimates indicate annual investments must increase at least 10x in 2030 (see Figure 3).

Figure 3: Current and required resilience investments

Current and required resilience finance flows to EMDEs, US$bn



Source: UN Environment Programme (2024). Adaptation Gap Report 2024; Bridgetown Initiative analysis.

This paper outlines a four-part process for how finance ministries, with support from other government agencies as well as the IMF and World Bank, can assess and plan for resilience investments within macrofiscal frameworks:

1. **Understand climate and nature risks, and identify resilience investment needs**
   A first step is to develop a clear picture of a country's exposure to climate and nature risks and the likely macroeconomic impacts of these risks – both acute and chronic. This understanding can then inform an assessment of the investments needed to reduce those risks. To support this assessment, the paper introduces a typology that categorizes resilience investments by risk type and sector, and provides illustrative cost estimates. This can help streamline how resilience needs are defined and compared across institutions. Building on this, countries can tailor the typology to their specific risk profiles and priorities, drawing on existing strategies like NDCs and NAPs.

2. **Reflect resilience investments into countries' growth projections**
   Once resilience investment needs have been identified, their potential impact on a country's growth trajectory can be assessed. This involves estimating how investments—such as in flood defenses, mangrove restoration or early warning systems—could reduce future economic losses, boost productivity, and strengthen overall economic stability. Similar methods are already used to model the growth impacts of physical infrastructure or energy transition investments. Climate-resilient infrastructure offers a practical starting point for developing methodologies to estimate the link between resilience investments and growth.[11]

3. **Integrate expected growth impacts of resilience investments into debt sustainability frameworks**
   Once the expected growth impacts of resilience investments are understood, the next step is to integrate them into countries' DSAs. This can help demonstrate how resilience investments affect a country's debt-carrying capacity – showing that, under the right financing conditions, such investments can be fiscally sustainable and even improve long-term fiscal outlooks. For many countries, implementing resilience strategies will require significant upfront spending. By incorporating the benefits into DSAs, countries can build a stronger case for concessional and long-term finance, and clarify the conditions under which borrowing for resilience supports – rather than undermines – macroeconomic stability.

[11] The IMF's Debt-Investment-Growth and Natural Disasters (DIGNAD) toolkit is a good starting point. It enables users to evaluate debt sustainability risks following one-off natural disasters, amidst the need to rebuild public infrastructure. It can be used to analyze the effects of ex-ante policies, including building adaptation infrastructure

4. **Translate priorities into credible investment and financing plans**
   Once the growth and debt implications of resilience investments are understood, these insights can inform more credible, macro-aligned investment and financing plans. Countries can use this evidence to prioritize the most impactful interventions, identify and advocate for appropriate financing instruments (including grants and concessional finance), and integrate resilience investments into medium-term expenditure frameworks and budget processes. Including resilience investments into financial planning supports improved coordination with development partners on the financing volumes and terms needed to deliver on government's ambitions and increases the chances of attracting private capital to the table, where appropriate, by providing transparency on plans

This paper aims to support finance ministries, the IMF, the World Bank and development partners put the first step of this process into practice**: Understand climate and nature risks, and identify resilience investment needs**. It answers the following questions:

- **What economic risks do the climate and nature crises create?**
  The paper presents a harmonized framework for understanding climate and nature-related macroeconomic risks. It demonstrates that the vast majority of climate and nature shocks – both rapid and slow-onset – are driven by a combination of climate change and nature loss, and translate into economic costs for countries, undermining growth trajectories. It highlights the scale of the risks, which are often under-quantified in national and international planning, making it harder to build the case for action. (See Section 1).
- **What investments can reduce these risks, and how much do they cost?**
  To support countries in identifying and organizing their resilience needs, the paper introduces a consolidated typology of climate and nature interventions, mapped by risk type and sector. It includes high-level cost estimates by income group, drawing on and synthesizing existing cost estimates of resilience interventions (e.g. from UNEP and the IMF) to show where the evidence on costs currently stands and to offer a starting point for assessing the scale of investment needed. These tools are not meant to be definitive, but can help structure national-level planning and prioritization – especially when linked to existing strategies like NDCs and NAPs. Finally, the paper also compiles high-level evidence on the economic value of the typology's interventions, including cost-benefit ratios (particularly around avoided losses) and their broader growth impacts. This evidence offers an initial indication of the economic benefits and is intended to shift how these interventions are perceived: not as sunk costs, but as strategic enablers of long-term prosperity. (See Section 2).

In light of the ongoing LIC-DSF review, this paper also aims to help finance ministries, the IMF and the World Bank to put the third step of this process into practice: **Integrate expected growth impacts of resilience investments into debt sustainability frameworks.** It proposes high-level reforms to both the LIC-DSF and the SRDSF. (See Section 3).

By no means a silver bullet, what follows aims to be a practical starting point that helps equip countries and institutions with the framing, data gathering, and analytical approaches needed to begin integrating resilience into macrofiscal decision-making.

The role of sovereign credit rating agencies

The three major sovereign credit rating agencies (S&P Global Ratings, Moody's and Fitch Ratings) issue country credit risk ratings that affect borrowing costs and investor confidence, shaping access to both public and private capital. In this way, the agencies influence market perceptions and investment flows. Sovereign credit ratings are key to the cost of capital in EMDEs and the rating of specific financing products, such as government or private sector bonds. Their role is of course far greater than the IMF role in countries that do not require or seek IMF technical support or programs, such as the BRICS or high-income countries. Sovereign credit rating agencies incorporate their own debt sustainability analyses into their evaluations, run their own macroeconomic models, and increasingly assess how climate change and investments in climate adaptation influence countries' economic prospects. Preliminary conversations with rating agencies suggest that the proposals we identify in this paper to improve the IMF and World Bank DSA and its underlying macrofiscal frameworks may apply to some of their work as well. Today's ratings do not adequately consider how investments in resilience can lessen the impact of climate change on EMDEs. Nature risks are inadequately considered if at all. Sovereign credit rating agencies' macrofiscal tools must also change to incentivize investments in resilience.

1. CLIMATE AND NATURE'S JOINT MACROECONOMIC RISK

Climate and nature hazards are deeply connected and mutually reinforcing. In the context of climate, a hazard is commonly understood as the possible, future occurrence of physical events that may cause loss of life, injury or other health impacts, as well as damage and loss to infrastructure, property, livelihoods, service provision and environmental resources.[12] Examples include the chance of flooding, wind events, or landslides. The likelihood and severity of climate and nature hazards can be partly determined by the interplay between anthropogenic climate change and nature loss. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) distinguishes five drivers of nature loss or biodiversity loss: land- and sea-use change, pollution, natural resource use and exploitation, invasive species – and climate change.[13] Climate change both acts as a direct driver of nature loss and exacerbates the effects of the other four drivers, creating a feedback loop that deepens environmental damage. For example, rising temperatures and changing weather systems accelerate land degradation, intensifying land-use changes; changes in rainfall patterns increase the frequency of storms and floods, increasing the runoff of pollutants into rivers, lakes and oceans; the impacts of climate change can incite exploitation, as natural resources grow scarcer; invasive species outcompete native species as climate change creates newly favourable environments. Of course, nature loss is in turn a driver for climate change by undermining carbon sinks like oceans and forests.

The vast majority of climate and nature hazards are driven by *both* climate change *and* nature loss. We have developed an integrated climate and nature hazard framework to illustrate this point, and to assist with the identification of resilience interventions that can mitigate these risks (see Section 2). The framework includes a comprehensive list of climate and nature hazards,[14] categorized into four environmental domains (land, ocean, freshwater and atmosphere) and into chronic and acute hazards.[15] All assumptions made to develop this framework are described in Annex II Methodology.[16]

[12] Lavell, A et al. (2012). Climate Change: new dimensions in disaster risk, exposure vulnerability, and resilience. Intergovernmental Panel on Climate Change (IPCC). Available at: https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Chap1_FINAL-1.pdf

[13] IPBES, The global assessment report on Biodiversity and Ecosystem Services, 2019.

[14] In our framework, hazards that are 'climate-related' are caused directly by climate change and hazards that are 'nature-related' are caused directly by land- and sea-use change, pollution, natural resource use and/or invasive species.

[15] Chronic hazards: slow-onset hazards that develop gradually and continuously over time. Acute hazards: sudden, short-term hazards that result from immediate physical events or shocks. See Annex II Methodology.

[16] There is some simplification noting complex interrelationships between hazards, for example land use change significantly contributes to other "land" and "freshwater" chronic and acute hazards, as well as some others such as heat stress.

Figure 4: Integrated climate and nature hazard framework

	HAZARD		CLIMATE[1]	NATURE[2]
Chronic	Land	• Soil erosion and soil health decline	✓	✓
		• Land pollution	✓	✓
		• Decline of provisioning services (terrestrial ecosystems)		✓
		• Loss of pollination services		✓
		• Land use change	✓	✓
		• Residual loss of terrestrial biodiversity, habitat and species	✓	✓
	Ocean	• Sea use change	✓	✓
		• Coastal erosion	✓	✓
		• Sea level rise	✓	
		• Decline of provisioning services (marine ecosystems)	✓	✓
		• Ocean acidification	✓	
		• Residual loss of marine biodiversity, habitat and species	✓	✓
	Freshwater	• Reduced flood mitigation	✓	✓
		• Water stress	✓	✓
		• Water pollution and saline intrusion	✓	✓
		• Reduced regulation of water quantity and quality	✓	✓
	Atmosphere	• Temperature increase and variability	✓	
		• Changing wind patterns	✓	
		• Heat stress	✓	✓
		• Changing precipitation (patterns and types)	✓	✓
		• Air pollution	✓	✓
		• Disrupted regulation of climate, weather and air quality	✓	✓
		• Reduced storm mitigation	✓	✓
Acute	Land	• Residual acute terrestrial nature degradation[3]		✓
		• Mass movement (incl. landslide, avalanche)	✓	✓
		• Snow, glacier and icesheet thawing	✓	
		• Wildfires	✓	✓
		• Droughts	✓	✓
	Ocean	• Residual acute marine nature degradation[4]		✓
	Freshwater	• Floods	✓	✓
	Atmosphere	• Heatwave	✓	✓
		• Cold wave (frost)	✓	✓
		• Storms (incl. tornados, cyclone, hurricanes, typhoons)	✓	✓
		• Heavy precipitation (rain, hail, snow, ice)	✓	✓

1 Driven by climate change
2 Driven by nature loss
3 Man-made or natural acute and sudden ecosystem degradation causing ecosystem services decline

Earth system tipping points

Climate change accelerates nature loss and vice versa, compounding hazards and pushing many parts of the Earth system towards dangerous 'tipping points'. These tipping points are critical thresholds that, if reached, lead to large, accelerating and often irreversible changes in the climate and ecological systems – tipping a system from one stable state into a profoundly different state. One example is a rise in global temperatures and increased grazing triggering a rainforest to shift into a dry savannah. This change is driven by self-reinforcing feedback loops, which can persist even if the initial drivers, such as elevated temperatures, are reversed. Once tipped, the system – here, the rainforest – may not return to its previous state. Five major systems are already at risk of crossing tipping points: the Greenland and West Antarctic ice sheets, warm-water coral reefs, North Atlantic Subpolar Gyre circulation and permafrost regions. The crossing of one tipping point can trigger others in a cascading effect. For example, rapid ice sheet melt may slow down ocean circulation of heat, shifting the monsoon system over South America and contributing to the rising frequency of droughts in the Amazon, thereby undermining its carbon storage capacity. This is a global problem: if tipping points are reached, countries worldwide will experience the impacts of intensifying climate and nature hazards. Investments in critical global commons, like the Amazon, peatlands and coral reef systems, are needed alongside national investments to avoid tipping points and maintain a stable climate. However, investments in global commons are out of scope for this report. Instead, we focus on climate and nature resilience investments which can be made at the national level.

Source: Marsden, L et al. (2024). Ecosystem tipping points: Understanding risks to the economy and financial system. University of Exeter, Global Systems Institute.
Available at: https://wwfint.awsassets.panda.org/downloads/marsden-et-al-2024ecosystemtippingpoints.pdf

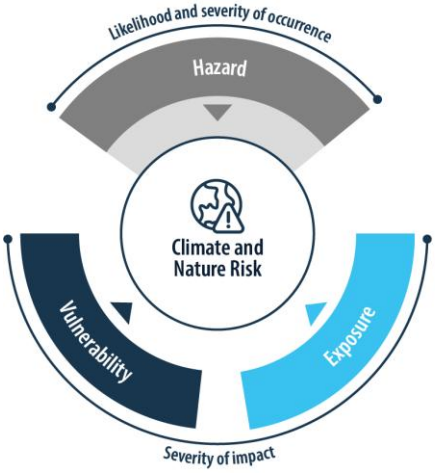
Climate and nature hazards translate into physical risks and economic costs for countries, threatening growth trajectories.[17] The risk posed by climate and nature hazards depends not just on the hazard itself but on a country's exposure and vulnerability. Exposure is defined by the people, assets, services, and infrastructure that could be harmed by a hazard, and vulnerability is the propensity or predisposition to be adversely affected (see Figure 5). Climate and nature risks threaten economic growth trajectories in two ways: first, climate and nature hazards directly destroy countries' capital stocks, resulting in disruptions to supply and demand (and high GDP volatility) (see *Case study: Hurricanes in Eastern Caribbean states* and *Case study: The recent floods in Pakistan)*;[18] second, both chronic and acute hazards can undermine capital accumulation. For example, droughts, floods, higher temperatures, soil degradation and loss of pollinators are a major threat to crop yields. Climate variability *already* accounts for a third of global crop yield fluctuations, while pests can reduce yields by between 18–34%.[19]

[17] This report focuses on economic costs of physical climate and nature risks, that is risks of damage caused by extreme weather conditions (acute risks) and more gradual climate and environmental changes (chronic risks). For acute risks, we consider both direct and indirect costs. The report does not consider transition risks, that is the risks of direct and indirect loss and damage during the transition to a low-carbon and nature-positive economy e.g. from the relatively abrupt introduction of climate and nature-related policies, from technological progress and from changes in market sentiment and market preferences.

[18] The IMF and NGFS identify several macroeconomic transmission channels through which climate and nature actions can have a macroeconomic impact. We have summarized here in disruptions to supply and demand. C.f. Gardes-Landolfini et al. (2024). Embedded in Nature: Nature-Related Economic and Financial Risks and Policy Considerations. IMF. Available at: https://www.imf.org/en/Publications/staff-climate-notes/Issues/2024/10/01/Embedded-in-Nature-Nature-Related-Economic-and-Financial-Risks-and-Policy-Considerations-555072; and NGFS. (2024). The green transition and the macroeconomy: a monetary policy perspective. Available at: https://www.ngfs.net/system/files/import/ngfs/medias/documents/ngfs_the-green-transition-and-the-macroeconomy.pdf

[19] Finance for Biodiversity. (2021). The Climate-Nature Nexus. Available at: https://www.naturefinance.net/wp-content/uploads/2022/09/F4B_Climate-Nature-Nexus_Implications-for-Financial-Sector_20210527.pdf

Figure 5: Physical risk and hazard, exposure and vulnerability



Hazard
The potential occurrence of climate or nature related physical events that may cause damage and loss.

Exposure
The presence of assets, services, resources and infrastructure that could be adversely affected by the hazard, e.g. people, ecosystems, infrastructure.

Vulnerability
The propensity or predisposition to be adversely affected by the hazard incl. sensitivity to harm and capacity to cope and adapt e.g. income level, floor height of buildings in a flood zone.

Climate and nature risks have macro-critical implications for EMDEs. Based on current literature, the impacts of climate and nature risks can only be assessed separately, as existing models do not capture their compounding effects. Despite this limitation, it is already evident that climate and nature risks are macro-critical. Some risks are highly likely to materialize and should be incorporated into EMDE's baseline macroeconomic projections. Others are low-probability tail risks, which should nonetheless be investigated to highlight the full scale of the challenge and demonstrate the true value of investments in resilience. In this section, we aim to convey the scale of both high- and low-probability climate and nature risks.

1. Climate risks

The most recent Network for Greening the Financial System (NGFS) Climate Scenarios V estimates that climate risks will reduce global GDP by 5.2–5.3% in 2030 and 10.1–14.8% in 2050, under an optimistic (or high-probability) and pessimistic (or low-probability) scenario.[20] However, the impact on EMDEs is far worse than the global average (Figures 6 and 7) – for example, the projected reduction is approximately 12–20% in 2050 for Vietnam, Brazil and Egypt (under an optimistic and pessimistic scenario). Based on available country-specific models, there is significant regional diversity – for example, economic losses in Latin America and the Caribbean under a pessimistic scenario in 2050 range from 8.4% (Chile) to 20.3% (Brazil), with the regional average being 16.2%. This diversity is likely to be even more pronounced in regions like East Asia and the Pacific and South Asia, given the wide variation in countries' geography and income levels. But as the NGFS Climate Scenarios do not produce country-specific results for any low-income countries, this regional diversity is likely hidden. It is important to note that these estimates carry uncertainty.

[20] NGFS. (2024). NGFS Climate Scenarios for central banks and supervisors - Phase V. Available at: https://www.ngfs.net/en/publications-and-statistics/publications/ngfs-climate-scenarios-central-banks-and-supervisors-phase-v. Pessimistic scenario: "Current Policies" scenario in which only current policies are maintained, without any additional climate measures. Under this scenario, global temperatures are projected to rise by ~1.5°C in the 2030s, ~2°C in 2050 and ~3°C by 2100. Optimistic scenario: "Below 2°C" scenario in which a transition consistent with limiting global warming to below 2°C occurs, i.e. climate policies are introduced early and become gradually more stringent, achieving net zero emissions before 2070.

The NGFS Climate Scenarios V rely on the Kotz et al. (2024) damage function, which represents the high end of the literature.[21] Its use underscores the growing concern over underestimated climate impacts. Other, recent projections of the economic impact of climate risks are far worse than the NGFS Climate Scenarios: some suggest that, at 3°C of global warming, economic losses could exceed 40% of GDP.[22]

Figure 6: NGFS Climate Scenarios Phase V: Economic losses under a pessimistic scenario

Economic losses from physical climate risk under current policies scenario

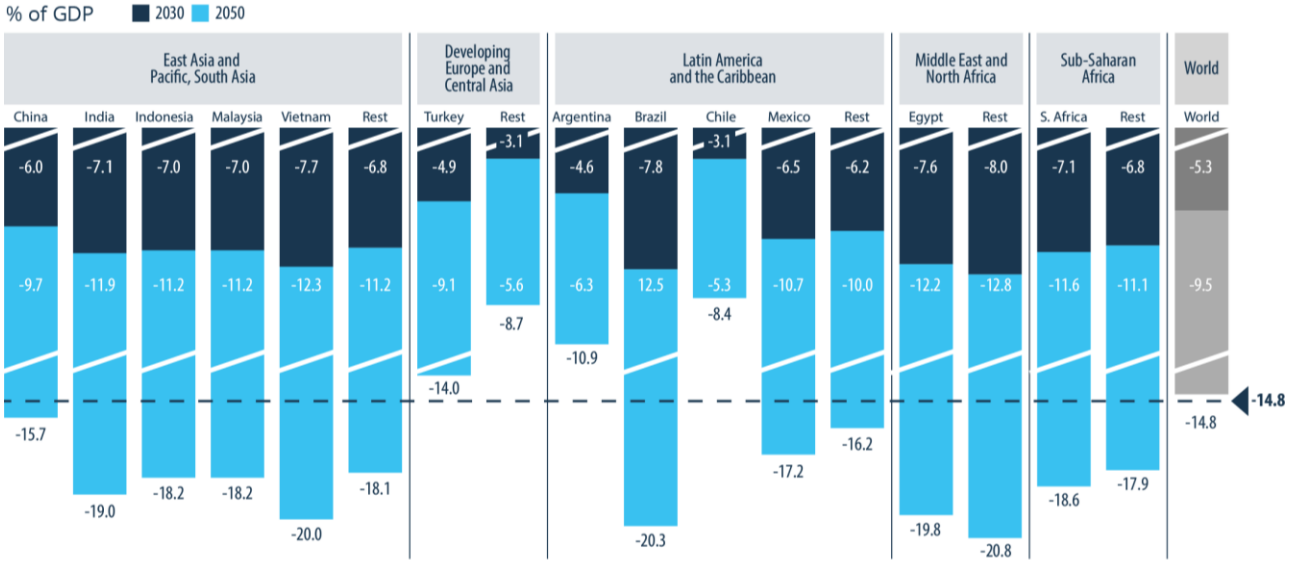
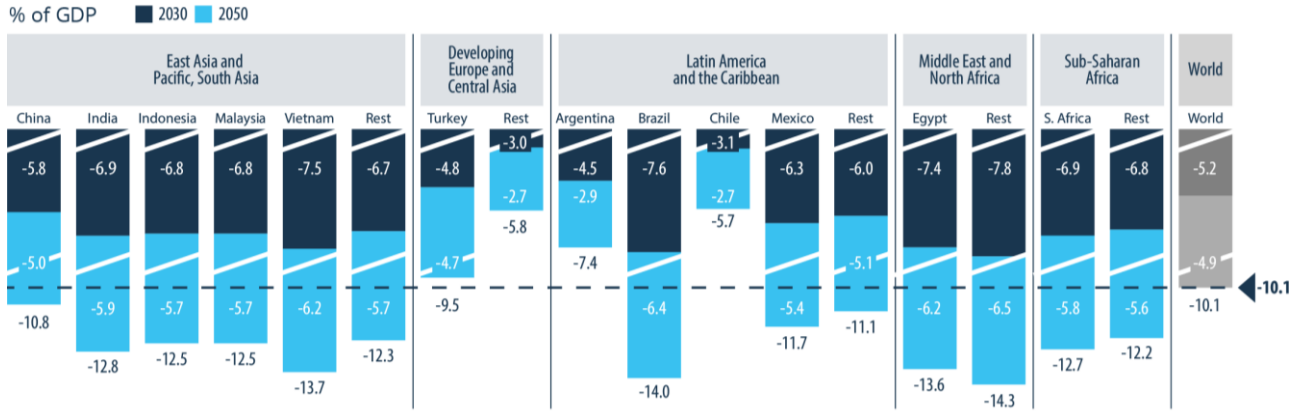


Figure 7: NGFS Climate Scenarios Phase V: Economic losses under an optimistic scenario

Economic losses from physical climate risk under below 2°C scenario



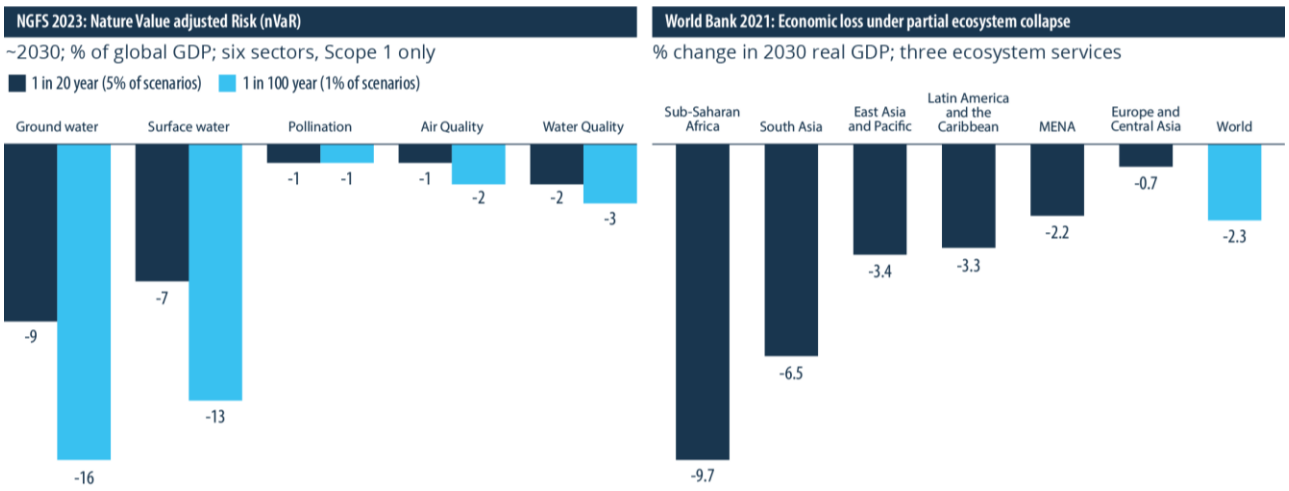
[21] The latest NGFS scenario implements a new damage function authored by Kotz et al. (2024) and recently published in Nature. This shift marks a considerable change in the overall severity of the damage caused. It is based on the most recent climate and economic datasets, which offer highly granular and robust data with excellent geographic and temporal coverage. It covers a wide range of climatic variables. And it accounts for the persistence effects of climate shocks on economic output. The NGFS concludes that the new damage function does a much better job than its predecessor at representing the physical risks posed by climate change. However, others such as IPCC AR6 assess a similar class of models and damage functions that Kotz et al. build on and notes the uncertainty around such estimates.

[22] NGFS. (2024.) Damage functions, NGFS scenarios, and the economic commitment of climate change: An explanatory note. Available at: https://www.ngfs.net/system/files/import/ngfs/media/2024/11/05/ngfs_scenarios_explanatory_note_on_damage_functions.pdf

2. Nature risks

Existing economic loss projections are still in their early stages, with significant variation in magnitude due to differences in scope.[23] Estimates of losses due to high-probability risks are scarce. The NGFS estimates the "nature value-adjusted risk" from the decline of five ecosystem services on six sectors in the global economy.[24] Under pessimistic scenarios (5% of all scenarios), it projects that in 2030 7–9% of global GDP is at risk from the direct impacts of water-related risks alone. Under extremely pessimistic scenarios (1% of all scenarios), it projects that 13–16% of global GDP is at risk.[25] In an earlier study, the World Bank projects a 2.3% reduction in global GDP in 2030 assuming the partial collapse of three ecosystem services: wild pollination, provision of food from marine fisheries, and provision of timber from native forests.[26] Once again, the impact on EMDEs is more severe, with projected GDP reductions of 9.7% and 6.5% for sub-Saharan Africa and South Asia respectively.

Figure 8: Estimates of economic loss due to nature risk



While it is clear that both climate and nature risks are macro-critical, existing projections underestimate the magnitude of the associated risks. In evidence of constant underestimation, projections of climate-related losses for the same scenario have trended higher over time (Figures 9 and 10). This trend reflects improvements in both our understanding of climate and nature risks and ongoing improvements in modelling methods. For example, the NGFS' initial projections did not consider the impact of acute climate risks or the full range of transmission channels for climate hazards (e.g. the impact of heatwaves on labour productivity). In its most recent projections, the NGFS now captures climate change impacts beyond increases in mean temperature (e.g. changes in precipitation trends) and captures lagged effects of climate shock on economic output (up to 10 years). As a result, its estimates of economic losses from acute climate risk increased from 2.6–5.5% of GDP in 2050 to 10.1–14.8% (under an optimistic and pessimistic scenario).

[23] Differences in modelling approach also likely play a role. The NGFS projections rely on Input-Output modelling and are not the result of a macroeconomic model. The World Bank projections are the product of an integrated ecosystem-economy model, linking a Computable General Equilibrium (CGE) model to a suite of ecosystem services models.

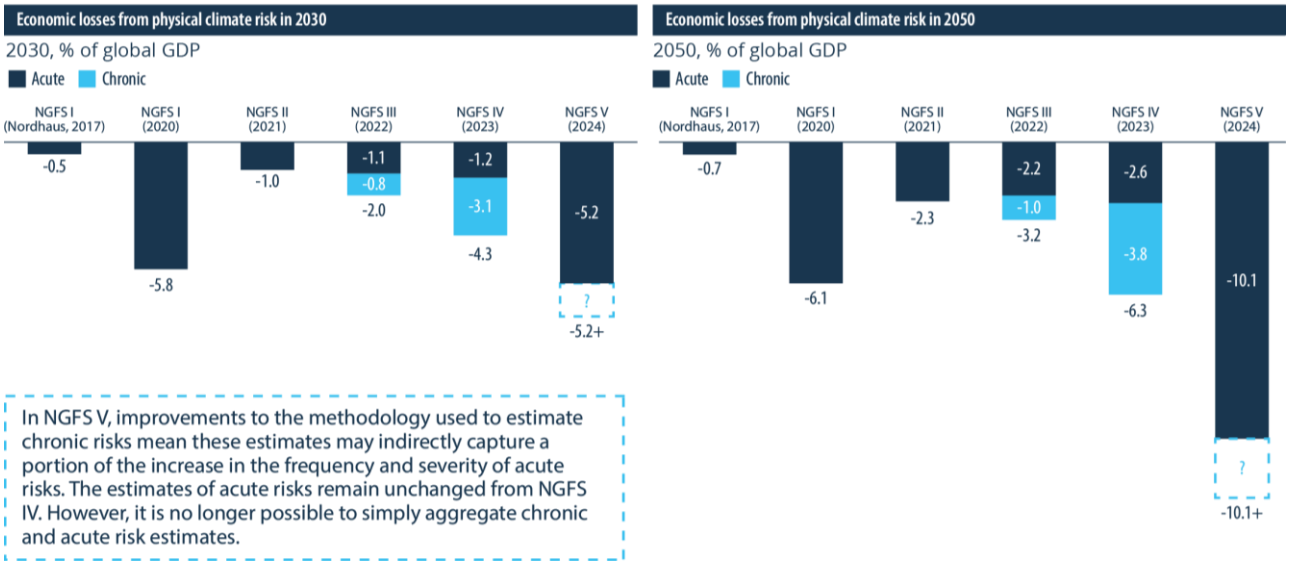
[24] Ranger, N et al. (2023). The Green Scorpion: the Macro-Criticality of Nature for Finance. NGFS Occasional Paper. Available at: https://www.ngfs.net/system/files/import/ngfs/medias/documents/ngfs_occasional_paper_green-scorpion_macrocriticality_nature_for_finance.pdf

2525 At risk refers to nature value-adjusted risk, linked to the probabilities detailed in text. See: Ranger, N et al. (2023). The Green Scorpion: the Macro-Criticality of Nature for Finance. NGFS Occasional Paper. Available at: https://www.ngfs.net/system/files/import/ngfs/medias/documents/ngfs_occasional_paper_green-scorpion_macrocriticality_nature_for_finance.pdf

[26] Ruta, G et al. (2021). The Economic Case for Nature. World Bank. Available at: https://www.worldbank.org/en/topic/environment/publication/the-economic-case-for-nature

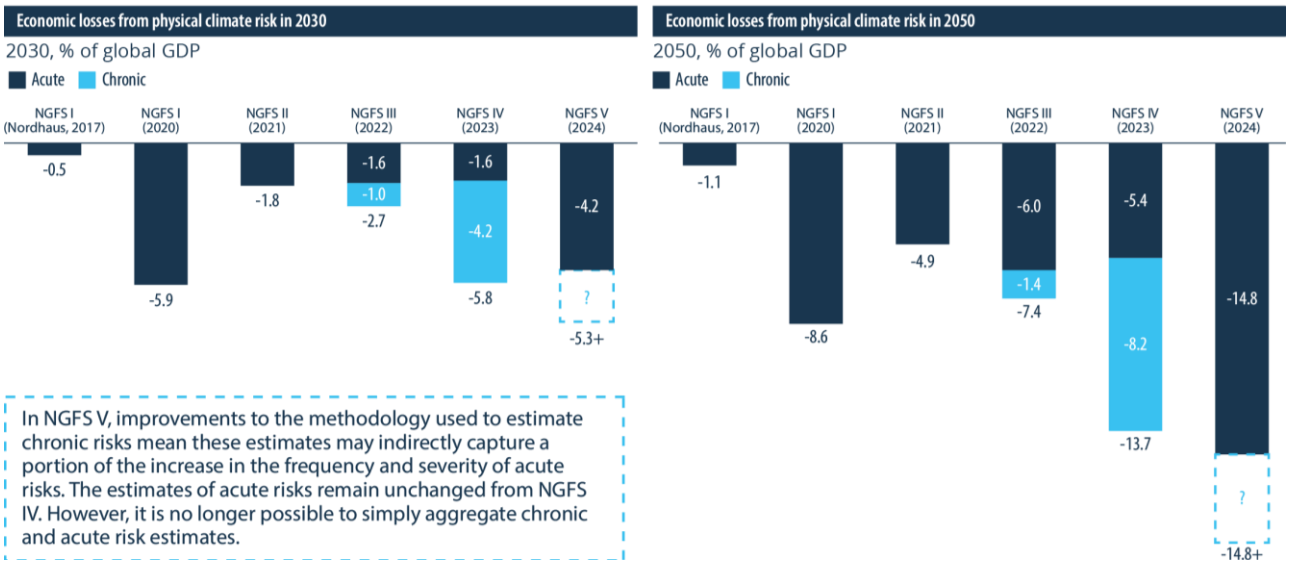
However, the NGFS Climate Scenarios still do not capture the full range of indirect climate hazard impacts, acute risks associated with sea level rise and ocean acidification or the impacts of reaching climate tipping points (see Box: Earth system tipping points.). Nature-related loss estimates are similarly limited. While the NGFS projections are more comprehensive than the World Bank's,[27] they cover only direct impacts of ecosystem service collapse, are not derived from macroeconomic modelling (and so exclude transmission channels like labour productivity), and lack geographic coverage of low-income and lower-middle-income countries.

Figure 9: NGFS Climate Risks: Estimates of economic losses over time under an optimistic scenario



In NGFS V, improvements to the methodology used to estimate chronic risks mean these estimates may indirectly capture a portion of the increase in the frequency and severity of acute risks. The estimates of acute risks remain unchanged from NGFS IV. However, it is no longer possible to simply aggregate chronic and acute risk estimates.

Figure 10: NGFS Climate Risks: Estimates of economic losses over time under a pessimistic scenario



In NGFS V, improvements to the methodology used to estimate chronic risks mean these estimates may indirectly capture a portion of the increase in the frequency and severity of acute risks. The estimates of acute risks remain unchanged from NGFS IV. However, it is no longer possible to simply aggregate chronic and acute risk estimates.

[27]The NGFS estimates cover five ecosystem services, including water-related ecosystem services which have significant relative impact. In contrast, the World Bank estimates cover only three ecosystem services and exclude water. Additionally, the NGFS estimates take a more detailed, sectoral approach.

Advances in climate and nature science will enable macroeconomists to treat these risks as one integrated agenda and recognize their true scale. Critically, neither the climate nor nature-related projections above account for compounded risks from climate-nature interactions, and instead hold nature impacts and climate impacts constant in the scenarios explored. Addressing these gaps as data becomes available will be vital to better understand the macro-critical nature of these risks and their implications for economic stability.

In the meantime, case studies can illustrate aspects of climate and nature risk that current estimates overlook or obscure. Specifically, the case studies below on hurricanes in Eastern Caribbean States and the recent floods in Pakistan give an indication of the potential scale of acute climate and nature risks, noting annual estimates can obscure more severe impacts as they tend to average out the effects of extreme events. Additionally, the case study on land degradation in Malawi captures the impacts of a nature hazard overlooked in current estimates, as well as the interaction between climate and nature risks. Moreover, these case studies are valuable as data is inherently uncertain, and predictions – especially for long-term planning – are rarely precise. Drawing on real-life examples helps ground decision-making in tangible impacts.

Case Study: Hurricanes in Eastern Caribbean states

Eastern Caribbean island states have historically been exposed to a wide range of climate and nature hazards, including hurricanes, floods and droughts, to which they are highly vulnerable. Their small populations and land areas mean they lack economies of scale, are less diversified and are heavily dependent on tourism – a sector that is itself highly susceptible to climate and nature impacts. Already, Caribbean states lose on average 3.6% of their GDP each year to hurricanes alone. However, losses from specific events can be much larger. In Dominica, the costs of 2017's Hurricane Maria were over 220% of the country's GDP that year. In Grenada, the costs of 2004's Hurricane Ivan were 150% of its GDP. In particular, infrastructure suffers costly damages with long-term impacts on economic growth trajectories. After Hurricane Ivan, the cost to rebuild the electrical grid alone was $42 million (6% of GDP). And in Dominica, housing represented 38% of total recovery needs following Hurricane Maria, with the homes of the most vulnerable hardest hit.

Source: World Bank. (2024). Dominica, Grenada, Saint Lucia, and Saint Vincent and the Grenadines CCDR.

Case Study: The recent floods in Pakistan

In 2022, Pakistan experienced catastrophic monsoon rains and flooding, unprecedented in scale and impact. The floods affected 33 million people, and nearly eight million people were displaced. The floods took the lives of more than 1,700 people, one-third of them children. The World Bank's Post-Disaster Needs Assessment (PDNA) estimated the total damage as $14.9 billion (equivalent to 4.8% of GDP) and total economic loss as $15.2 billon. This dealt a severe blow to capital accumulation and growth, with critical infrastructure such as roads and dams washed away, more than 2.3 million homes damaged or destroyed, and 1.7 million hectares of crops and 800,000 livestock wiped out. As a direct result of the floods, an additional 8.4 to 9.1 million people were pushed into poverty. The overall decline in Pakistan's GDP as a direct result of the floods alone is estimated at 2.2% of FY22 GDP, including a 0.9% contraction in the agriculture sector. This does not yet incorporate the spillover effects that damage and losses in agriculture have on industry, external trade and services sectors. On top of this, recovery and reconstruction needs were $16.3 billion – 1.6 times the budgeted national development expenditure for FY2023 – diverting much-needed investment from poverty reduction and development and constraining its ability to lay the foundations for future economic growth.

Source: World Bank. (2022). Pakistan Floods 2022 Post-Disaster Needs Assessment.

Case Study: Land degradation in Malawi

Land degradation poses a severe challenge in Malawi, affecting over 80% of the country's land area. Deforestation, driven by fuelwood harvesting and unsustainable farming practices, has led to significant topsoil loss, reducing agricultural productivity and economic growth. Currently, three-quarters of Malawi's land faces severe topsoil erosion, with projections showing that even a 10–30% increase in topsoil erosion could reduce maize yields by 1–3% of GDP. Beyond these direct impacts, land degradation also exacerbates the effects of both climate and nature risks by undermining physical capital stock. Healthy forests and landscapes act as natural buffers, absorbing water and preventing soil erosion, but their degradation increases vulnerability to flooding and other disasters. Under RCP4.5, the combined impacts of land degradation and climate risks are projected to increase physical capital losses from inland flooding by 15%, and under RCP8.5, by nearly 25%. These interactions show how land degradation not only reduces productivity but also compounds other risks, causing widespread damage to both natural and built systems critical to Malawi's growth and resilience.

Source: World Bank. (2022). Malawi Country Climate and Development Report. CCDR Series. Asfaw, S et al. (2018). Soil and nutrients loss in Malawi: an economic assessment. Food and Agriculture Organization of the United Nations.

2.
THE TYPE AND SCALE OF RESILIENCE INVESTMENTS

We present a comprehensive typology of climate and nature resilience interventions. The typology maps climate and nature hazards (Section 1), translates these hazards into sector-specific risks, and identifies corresponding resilience interventions. In this way, the typology provides a full spectrum of measures countries can adopt to address climate and nature risks – some of which will be public and some private. For the most part, interventions are drawn from the three leading adaptation typologies (UNEP, IPCC and UNFCC),[28] as well as the Environmental Change Institute's (ECI) overview of 24 existing adaptation taxonomies; where this left gaps, we consulted additional sources (see Annex II Methodology).[29] Most existing typologies are focused on climate adaptation and only include nature-based interventions which can reduce climate risk. Our framework, however, covers interventions that also address nature risks – and so captures a broader range of nature-based interventions.

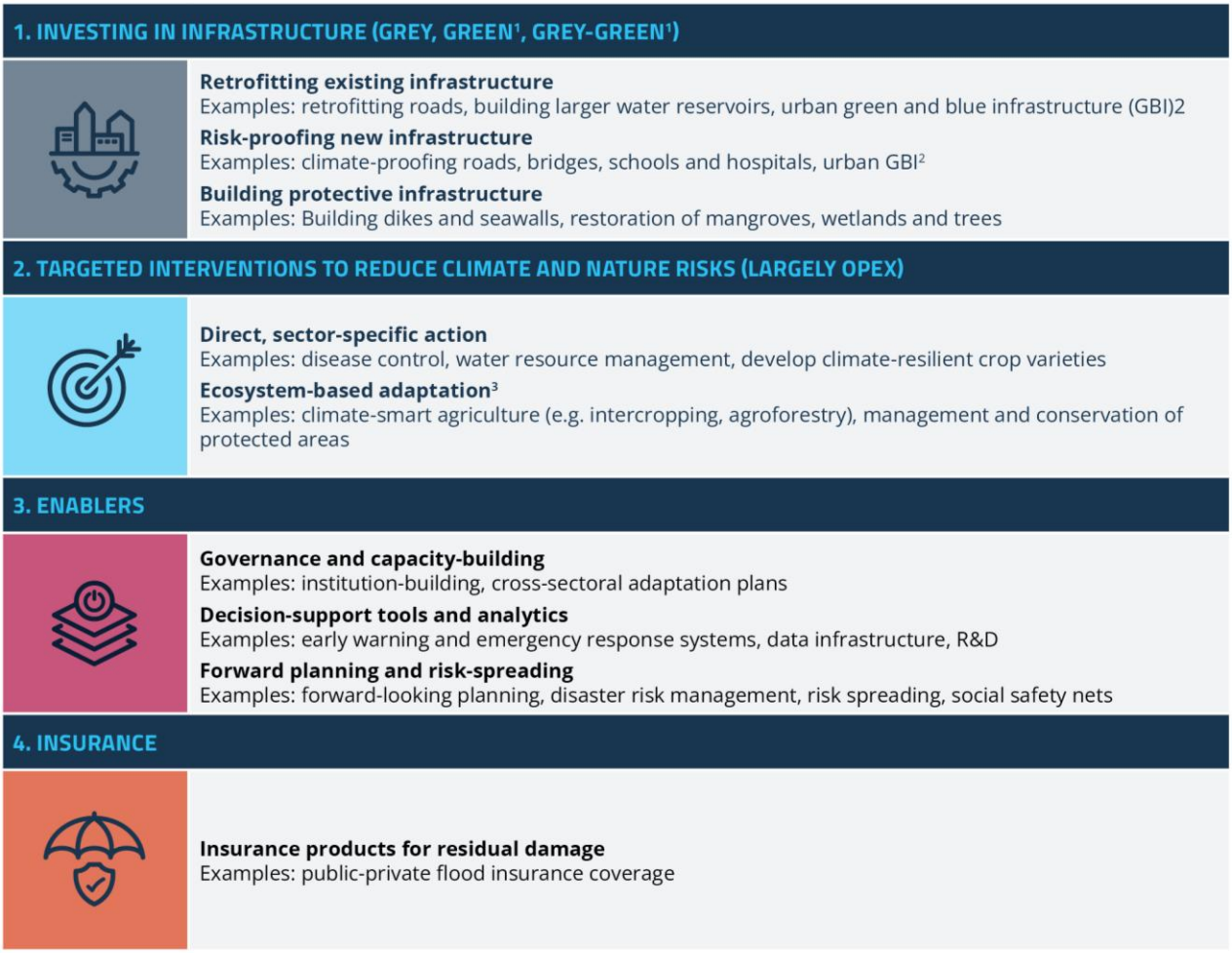
Four types of interventions to mitigate climate and nature risks are considered: infrastructure, targeted actions, enablers, and insurance. The role of insurance in building climate and nature resilience is not covered in this document, nor are cost estimates for insurance interventions provided. However, the inclusion of insurance in this categorization recognizes that, despite resilience efforts, some (possibly significant) residual climate and nature risk will remain. Insurance has a clear role to play as it can provide protection against these losses (this is the topic of a separate BI3.0 paper).[30]

[28] United Nations Environment Programme. (2023). Adaptation Gap Report 2023. Available at: https://www.unep.org/resources/adaptation-gap-report-2023; Intergovernmental Panel on Climate Change. (2022). Climate Change 2022: Impacts. Adaptation and Vulnerability. Available at: https://www.ipcc.ch/report/ar6/wg2/; UNFCCC. (2023). National Adaptation Plans Progress Publication 2023. Available at: https://unfccc.int/documents/635394

[29] Spacey, M et al. (2024). The (in)coherence of adaptation taxonomies. Environmental Change Institute. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4874598

[30] On top of this, insurance can determine what is deemed investable by influencing risk perception. Without insurance, countries may struggle to attract the necessary investments for resilience.

Figure 11: Four types of resilience interventions



1 'Nature as infrastructure' leverages natural ecosystems strategically to meet infrastructure needs conventionally addressed through man-made solutions (AIIB, 2023).
2 Urban green and blue infrastructure (GBI) encompasses incorporating green spaces and water elements into urban and infrastructure settings, such as green walls and green roofs (Oxford - Pinto et al., 2023)
3 Ecosystem-based adaptation is the use of ecosystem management activities to increase resilience and reduce the vulnerability of people and ecosystems to climate change (IPCC, 2022). It is a subset of NbS that looks specifically at using ecosystems for climate adaptation (UNFCCC, 2024).

Figure 12: Climate and nature resilience intervention typology

	TYPE OF INTERVENTION	INTERVENTIONS
Agriculture and food security		• Resilient infrastructure along the value chain
		• Resilient water management and irrigation
		• Climate monitoring and forecasting for agrifood
		• Agriculture adaptation R&D
		• Resilient agricultural production
Health		• Disease detection, surveillance and control systems
		• Vaccines, medical products and technology for climate-sensitive diseases
		• Heat mitigation and heat-alert schemes
		• Health sector response to respiratory health issues
		• Health sector response to malnutrition and exposure to hazards
		• Targeted measures to improve mental and psychosocial health
		• Emergency health services
		• Climate and nature-health information, surveillance and early warning systems
		• Health workforce training
		• Resilient health infrastructure (including building, equipment, IT)
		• Resilient healthcare supply chains
Water and sanitation		• Resilient, upgraded and accessible water supply and sanitation infrastructure
		• Alternative sources of water supply
		• Water-use efficiency and integrated management of water resources
		• High-quality and safe water
Terrestrial biodiversity and ecosystems		• Expansion and adaptation of terrestrial protected areas
		• Ecosystem-based adaptation outside protected areas
Coastal systems and low-lying areas		• Coastal protection and hardening
		• River flood protection
		• Integrated coastal zone management
		• Restoration and creation of coastal habitats
Infrastructure and built environment		• Resilient energy and transport subsectors
		• Urban green and blue infrastructure
		• Resilient built environment
Fisheries, aquaculture and marine ecosystems		• Sustainable fisheries and aquaculture production
		• Expansion and adaptation of marine protected areas
		• Ecosystem-based adaptation outside protected areas
Education		• Resilient education sector
Adaptation for business and industry		• Resilient tourism industry
		• Resilient other industries and commerce
Cross-sectoral enablers		• Governance and capacity building
		• Decision-support tools and analytics
		• Forward planning, risk management and risk spreading

With a view to providing a clear sense of what it means to invest in resilience, we provide initial cost estimates for all major interventions in the climate and nature resilience typology (see Annex II Methodology). We expect that climate and nature experts will refine this over time. These estimates outline each income group's investment needs per intervention, identifying the additional spending required in each sector to achieve development goals while addressing climate and nature risks. For example, each income group's cost estimate for "resilient transport and energy infrastructure" incorporates the additional investments needed to ensure that all future infrastructure is built to withstand projected climate and nature hazards, but does not account for the base cost of building infrastructure to existing service levels.[31] These estimates cannot be used for country-level programming, as they are based on income group averages.[32] They do, however, provide a sense of the scale of investment required.

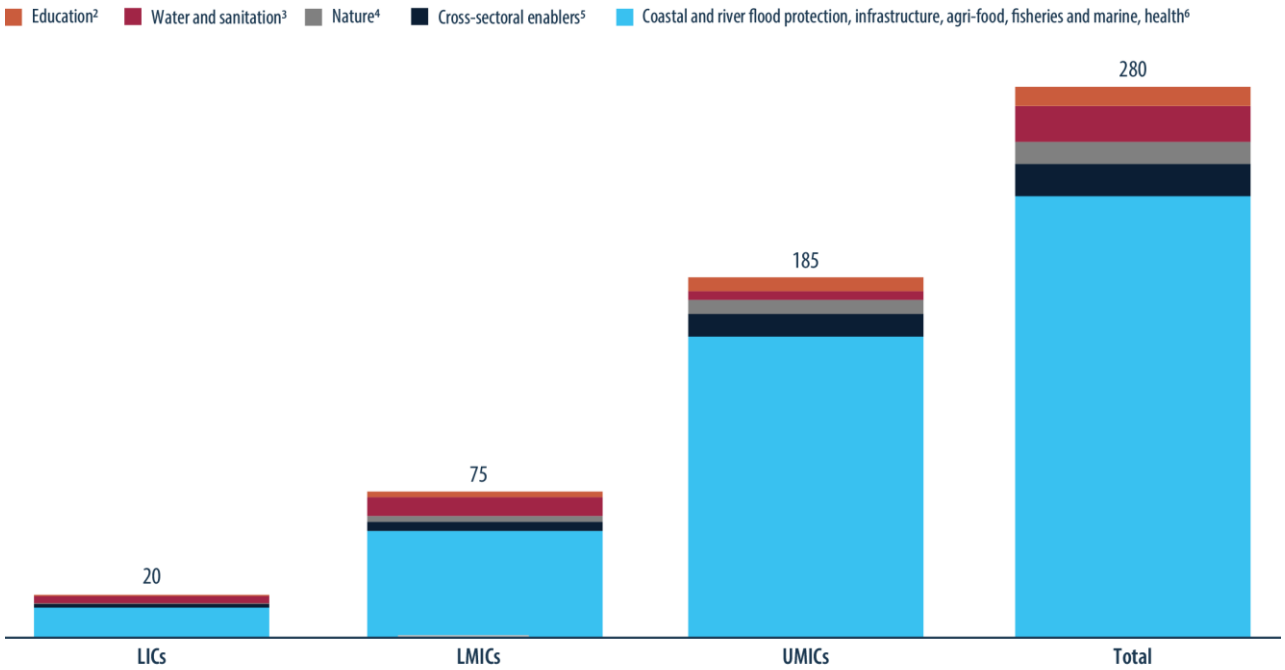
We compile existing cost estimates for key interventions – largely relying on studies by the UNEP (the basis of IHLEG's estimates) and the IMF, all of which follow a normative methodology (see Annex II Methodology).[33] The cost estimates set out annual investment needs by 2030; future work should extend this outlook to 2035 to provide a clearer picture of medium-term spending needs. The cost estimates are not comprehensive: they cover the major components of key interventions (which are largely public sector interventions), but some remain uncosted. We clearly indicate where interventions are partially costed or uncosted to support future work to develop these cost estimates, both at the income group level and the country level. Of course, countries cannot fully adapt to climate change and nature loss, particularly if greenhouse gas concentrations continue to rise – there is some level of unavoidable, residual risk. Governments must determine an acceptable level of residual risk with regards to the costs and benefits of each intervention, other development priorities, and societal ethical norms and risk aversion. The approach to the cost estimates is to include all interventions with a cost-benefit ratio greater than 1 but, in practice, governments will need to make trade-offs based on their priorities and constraints.[34]

The additional cost of climate and nature resilience investments in EMDEs is estimated at US$280 billion by 2030, equivalent to 0.58% of EMDE GDP in 2030. There are significant differences in cost burdens between income groups: upper middle income countries (UMICs) bear the largest additional costs in absolute terms, driven by large emerging economies like China and Indonesia with sizeable populations and significant infrastructure needs. [35] However, low income countries (LICs) have the highest investment needs relative to GDP – four times as high as lower middle income (LMICs)countries and six times as high as UMICs.

[31] The level of future infrastructure is determined by reference to development goals e.g. relevant Sustainable Development Goals.
[32] For use in country-level programming, countries should recompute these estimates based on comprehensive, country-specific data (in line with our methodology).
[33] United Nations Environment Programme. (2023). Adaptation Gap Report 2023. Available at: https://www.unep.org/resources/adaptation-gap-report-2023; Aggarwal, R et al. (2024). Accounting for Climate Risks in Costing the Sustainable Development Goals. IMF. Available at: https://www.imf.org/en/Publications/WP/Issues/2024/03/08/Accounting-for-Climate-Risks-in-Costing-the-Sustainable-Development-Goals-544040; UNEP. (2022). State of Finance for Nature 2022. Available at: https://www.unep.org/resources/state-finance-nature-2022
[34] Particularly for coastal and river flood protection, there exists a significant amount of residual damage after investing in coastal hardening. Any adaptation scenario therefore is a delicate balance between investing in coastal protection and accepting residual loss.
[35] Cost estimates do not entirely scale with population size or infrastructure needs as investment requirements are often tied to tradable commodities.

Figure 13: Additional cost of climate and nature resilience investments in EMDEs (absolute)

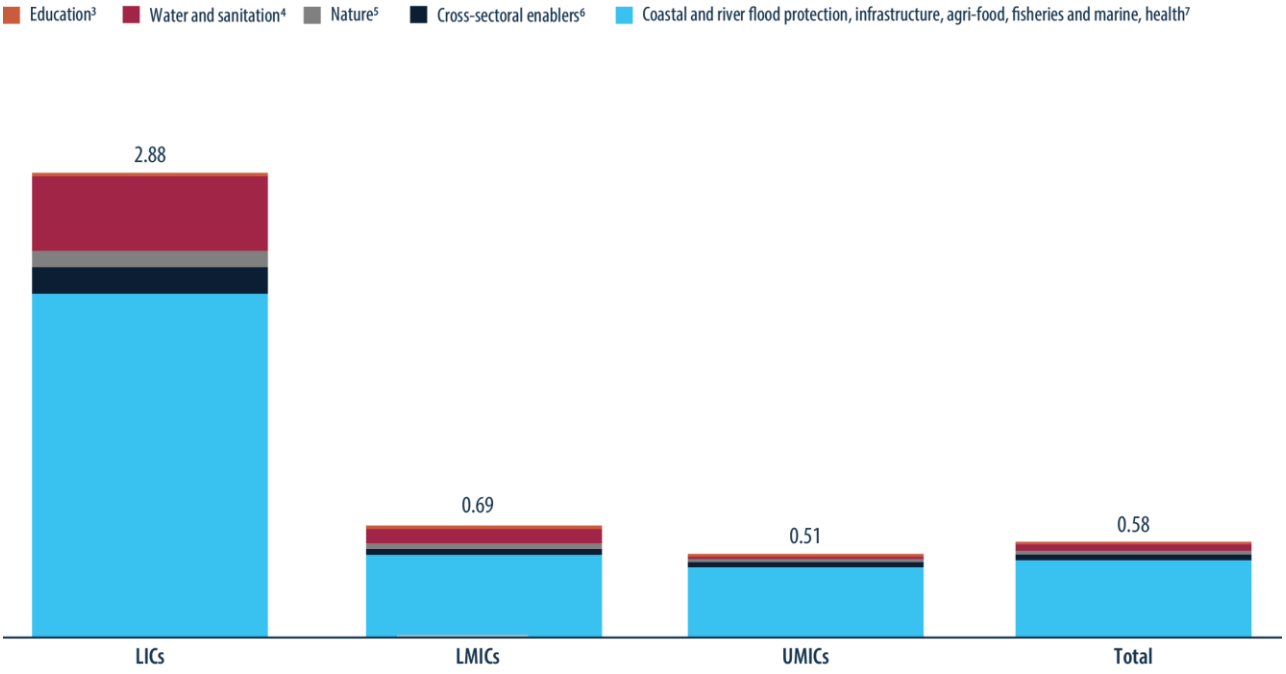
Investments needed in EMDEs[1] ($ billion by 2030, US$2023 prices)



1. Developing countries defined as 'non-Annex I countries under UNFCCC without HICs, i.e. only LICs, LMICs and UMICs 2. Bridgetown Initiative analysis, based on Carapella et al. (2023), IMF (2024), and UNESCO data on capital expenditure for education 3. Based on IMF (2024) 4. Additional costs of implementing 30x30 based on Waldron et al. (2022) 5. Assuming 12.5% markup for cross-sectoral enablers following UNEP 2023 6. UNEP (2023) covering adaptation estimates for coastal and river flood protection, infrastructure, agri-food, fisheries, and marine and health.

Figure 14: Additional cost of climate and nature resilience investments in EMDEs (relative to GDP)

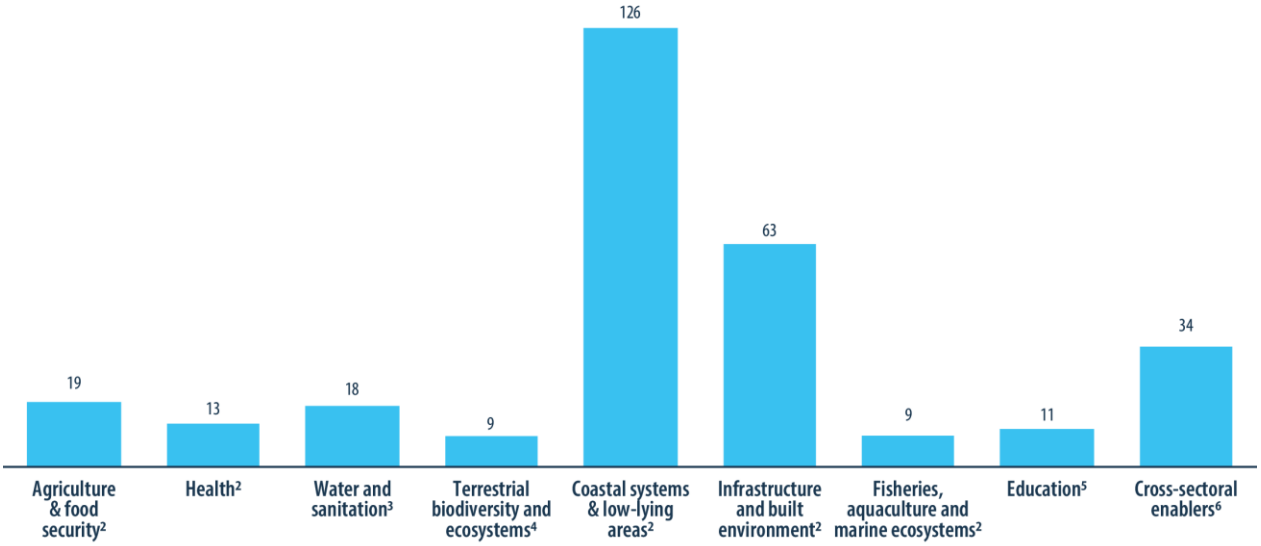
Investments needed in EMDEs[1] (% of GDP by 2030)[2]



1. Comparing all investment needs to GDP projections by country income group, based on IMF 2024 GDP projections until 2030 in current prices for each country income group, deflated to US$2023 prices 2. Developing countries defined as 'non-Annex I countries under UNFCCC without HICs, i.e. only LICs, LMICs and UMICs 3. Bridgetown Initiative analysis, based on Carapella et al. (2023), IMF 2024, and UNESCO data on capital expenditure for education 4. Based on IMF (2024) 5. Additional costs of implementing 30x30 based on Waldron et al. (2022) 6. Assuming 12.5% markup for cross-sectoral enablers following UNEP (2023) 7. UNEP (2023) covering adaptation estimates for coastal and river flood protection, infrastructure, agri-food, fisheries, and marine and health.

Figure 15: Additional cost of climate and nature resilience investments in Non-Annex 1 countries by sector[36]

Investments needed in Non-Annex 1 countries[1] ($ billion by 2030, US$2023 prices)



1. This covers LICs, LMICs, UMICs and 24 HICs according to the World Bank classifications, due to data availability 2. UNEP (2023). Adaptation Gap Report 2023, covering adaptation estimates for agri-food, disaster risk reduction, health, fisheries and marine, agriculture, infrastructure, river floods; 3. Based on IMF (2024); 4. Additional costs of implementing 30x30 based on Waldron et al. (2022) 5. Bridgetown Initiative analysis, based on Carapella et al. (2023), IMF (2024) and UNESCO data on capital expenditure for education 6. Assuming 12.5% markup for cross-sectoral enablers following UNEP (2023)

The initial cost estimates have inherent limitations that further analysis may help to resolve.[37] The cost estimates vary significantly across sectors due to differences in scope and estimation methods (see Annex II Methodology). Further work is required to harmonize methodologies to help make the numbers more comparable across sectors.

In particular, we highlight estimates for two sectors:

- **Infrastructure and built environment**
  Investment needs are somewhat low. First, the methodology excludes investment needs for public, private and household infrastructure in urban areas – an extremely large future infrastructure investment stream. Second, it only includes resilience investment needs for new infrastructure. Unlike other sector estimates (e.g. education, water and sanitation), it does not account for retrofitting existing structures to be resilient. This is a clear gap, as retrofits are a major component of resilience strategies.

- **Water and sanitation**
  Investment needs are relatively low because they focus exclusively on water and sanitation infrastructure for municipalities, not for industrial or agricultural purposes. (Note that the cost of WASH infrastructure for agricultural purposes is covered in the agriculture sector.) infrastructure, which will be needed to meet development goals.

[36] These estimates cover all non-Annex 1 countries, which includes some high income countries. This is a broader range of countries than covered in Figures 13 and 15; therefore totals do not add.
[37] These estimates are based on the best available data, but inherent challenges in scenario analysis, sectoral assumptions, and cross-country comparisons mean they are indicative only. They provide a useful starting point for use in the DSA, but should be strengthened by country-specific, targeted analysis where possible.

Finally, we present high-level evidence of the economic impacts of resilience investments. A major benefit of resilience investments is avoided losses from climate and nature risks. There is significant uncertainty around the extent to which resilience investments reduce losses, due to uncertainties in climate and nature scenarios and the modelled effectiveness of resilience measures in mitigating risks. However, global studies suggest that the avoided losses can be substantial, with cost-benefit ratios ranging from 4:1 to 9:1 – meaning the benefits, primarily driven by avoided losses, could be four to nine times the initial investment.[38] Additionally, like other public expenditures, resilience investments can generate economy-wide benefits. For example, investing to protect terrestrial and marine areas not only enhances resilience but also impacts sectors like agriculture and tourism – where recent estimates suggest average multipliers ranging from 1.36 in agriculture to 3.2 in tourism.[39] Accounting for these effects is critical to better understand the impact of resilience investments on countries' debt trajectories and growth outlooks.

The cost benefit-ratios and investment multipliers we provide are high-level and indicative only, noting these vary widely between countries and sometimes across sources. Moreover, pay-offs from specific investments may not easily translate into economy-wide multipliers that can guide macro frameworks (the "micro-macro paradox"). For this reason, the estimates we provide are highly preliminary and is intended only to help shift how these interventions are perceived. Further evidence is needed to develop cost benefit-ratios and investment multipliers which can be integrated into growth and debt sustainability frameworks.

[38] See Annex II Methodology for full list of sources.
[39] See Annex II Methodology for full list of sources.

3.
THE VIRTUOUS CYCLE: INTEGRATING CLIMATE AND NATURE INTO MACROFISCAL FRAMEWORKS

Integrating climate and nature investments into DSA frameworks

In light of the ongoing LIC-DSF review, this paper proposes high-level reforms to both the LIC-DSF and the SRDSF (including their operational guidance notes) to ensure the frameworks can indicate the financing terms that permit investments in resilience to be macro-feasible. This should start with the inclusion in both the LIC-DSF and the SRDSF of alternative scenarios to assess both climate and nature risks and investments.

The IMF-World Bank debt sustainability frameworks do not pay sufficient attention to the growth impacts and financing needs of climate and nature resilience investments. This is changing slowly for climate risks and investments. For low income countries, the 2017 LIC-DSF guidance note introduced a natural disaster test, and the 2024 update provided further guidance to encourage the inclusion of climate risks and adaptation investments in baseline growth forecasts,[40] including to draw on in-depth and country-specific IMF and World Bank analyses and tools where available. For market access countries, the 2022 SRDSF guidance note introduced a natural disaster stress test and a climate module, including climate mitigation and adaptation sub-modules – allowing for 30-year projections of public debt and financing needs in light of adaptation and mitigation investment needs. In addition, the IMF has developed tools and models like Q-CRAFT and DIGNAD to estimate the impact of physical climate risks at the country-level, as well as in-house estimations of adaptation investment needs.

However, the coverage of climate risks and investments is not yet sufficient: both frameworks rely on baseline scenarios that assume no additional climate impacts beyond historical experience. This assumption is unrealistic and hides the true economic benefits of investing in climate resilience – noting that there will always be some residual income losses from physical climate risks. Critically, nature risks and investments in nature resilience are not covered.

There are five outstanding issues with both debt sustainability frameworks: [41]

- Any baseline macroeconomic forecast that excludes climate change impacts is unrealistic
- Nature risks impact baseline macroeconomic forecasts and their expected volatility, just as climate risks do
- In addition to physical infrastructure, countries need to maintain and strengthen natural capital to build resilience against climate change and nature loss
- A country's natural capital is productive and contributes to its long-term economic growth
- Many market-access countries are just as climate vulnerable as low-income countries.

As above, addressing these issues will require a comprehensive macroeconomic treatment of climate and nature risks and investments by the IMF and the World Bank.

[40] This is mandated for countries seeking access to the IMF's Resilience and Sustainability Facility (RSF) or World Bank Development Policy Operation with Catastrophic Deferred Drawdown Options (DPOs with CAT DDOs). It is encouraged in all other cases, with a presumption for inclusion for some countries (depending on data availability and climate-vulnerability). C.f. Supplement to 2018 Guidance Note on the Bank-Fund Debt Sustainability Framework for Low Income Countries, 2024.

[41] Schmidt-Traub et al. (2024). Integrating Climate Adaptation and Natural Capital into Macroeconomic Frameworks and Debt Sustainability. Systemiq. Available at: https://www.systemiq.earth/resource-category/integrating-climate-adaptation/

This must include both the development of new growth methodologies and targeted reforms to the debt sustainability frameworks themselves.

Figure 16: Proposals to reform the DSA frameworks and underlying macrofiscal frameworks

FRAMEWORK	CURRENT TREATMENT OF CLIMATE AND NATURE	PROPOSAL
GDP growth forecasts	N/A	Expand all growth forecasts to include: • Impact of high-probability climate and nature risks • Mitigating impact of (planned) climate adaptation and natural capital investments and policies (e.g. insurance, investments in physical and natural capital), noting there will be residual climate and nature risk or "loss and damage" • Natural capital as productive capital
LIC-DSF	• Baseline scenario – impact of high-probability climate risks and adaptation investments • Volatility assessments – impact of lower-probability climate risks and adaptation investment, e.g. insurance, physical capital (alternative scenarios and tailored natural disaster stress test)	• Include impact of nature risks and mitigating natural capital investment in baseline scenario and volatility assessments • Include long-term climate and nature resilience alternative scenarios or "modules" (as in SRDSF)

SRDSF	• Baseline scenario – average impact of climate risks and adaptation fiscal costs in line with historical impact
	• Volatility assessments – impact of climate shock (natural disaster stress test) for climate-vulnerable countries
	• Long-term, alternative forecast – fiscal costs of adaptation for climate-vulnerable countries, e.g. insurance, physical capital
		• Align with LIC-DSF
		  ○ Include impact of high-probability climate risks and adaptation investments in all baseline scenarios
		  ○ Include impact of lower-probability climate risks and adaptation investments in medium-term volatility assessments (debt fan chart module and "climate risk" stress test) for all countries
		  ○ Debt fan chart – a generic shock based on forward-looking, country-specific projections
		  ○ Stress test – specific shock, tailored to country's unique circumstances (e.g. flood risk)
		• Include nature risks and risk-mitigating natural capital investment in baseline forecasts and volatility assessments
		• Long-term alternative baseline forecast for all countries:
		  • Assess alternative scenarios, recognizing the uncertainty in long-term forecasts (e.g. different warming scenarios, different levels of resilience investment ambition)
		  • If fiscal costs of potential climate adaptation and nature resilience investments are shown to be high, build a customized country-specific scenario to assess how these costs can be funded while maintaining debt sustainability (e.g. debt restructuring, grants, highly concessional finance).[42]

[42] Martin, M. (2024). How to Ensure Debt Sustainability Accelerates Sustainable Development. Friedrich Ebert Stiftung.

How this process can drive access to finance for investments in resilience

This paper advocates for finance ministries and their partners to better reflect climate and nature reislience investments in macrofiscal frameworks. It outlines a four-part process to help finance ministries, the IMF and the World Bank in doing so:

1. Undertake climate and nature risks, and identify resilience investment needs
2. Reflect resilience investments into countries' growth projections
3. Integrate expected growth impacts of resilience investments into DSAs
4. Translate priorities into credible investment and financing plans.

The paper provides a practical starting point to better equip countries and institutions with the framing, data gathering and analytical approaches to advance this process – with a focus on steps one and three.

The process sits within a wider opportunity. As illustrated in *Figure 16*, integrating resilience investments into growth and debt sustainability frameworks can contribute to a virtuous cycle in which better planning and recognition lead to more targeted financing and more effective delivery:

- **Governments draw on macro-credible analysis** to support the development of resilience investment plans that align with growth and fiscal strategies.
- **The IMF and World Bank begin to reflect resilience investments** in their own projections and DSAs, particularly where clear links to macrofiscal outcomes are made.
- **Countries are better placed to engage with funders and market actors**, helping to make the case for concessional or blended finance that supports resilience goals.

The health sector: credible country-demand to unlock concessional finance

Clear and credible country demand is a necessary – but not sufficient – condition to unlock large-scale concessional finance. The experience in the health sector illustrates this point: in the early 2200s, funding for HIV/AIDS, malaria and tuberculosis increased significantly when governments shared credible investment strategies that were consistent with IMF-endorsed growth and adjustment strategies.

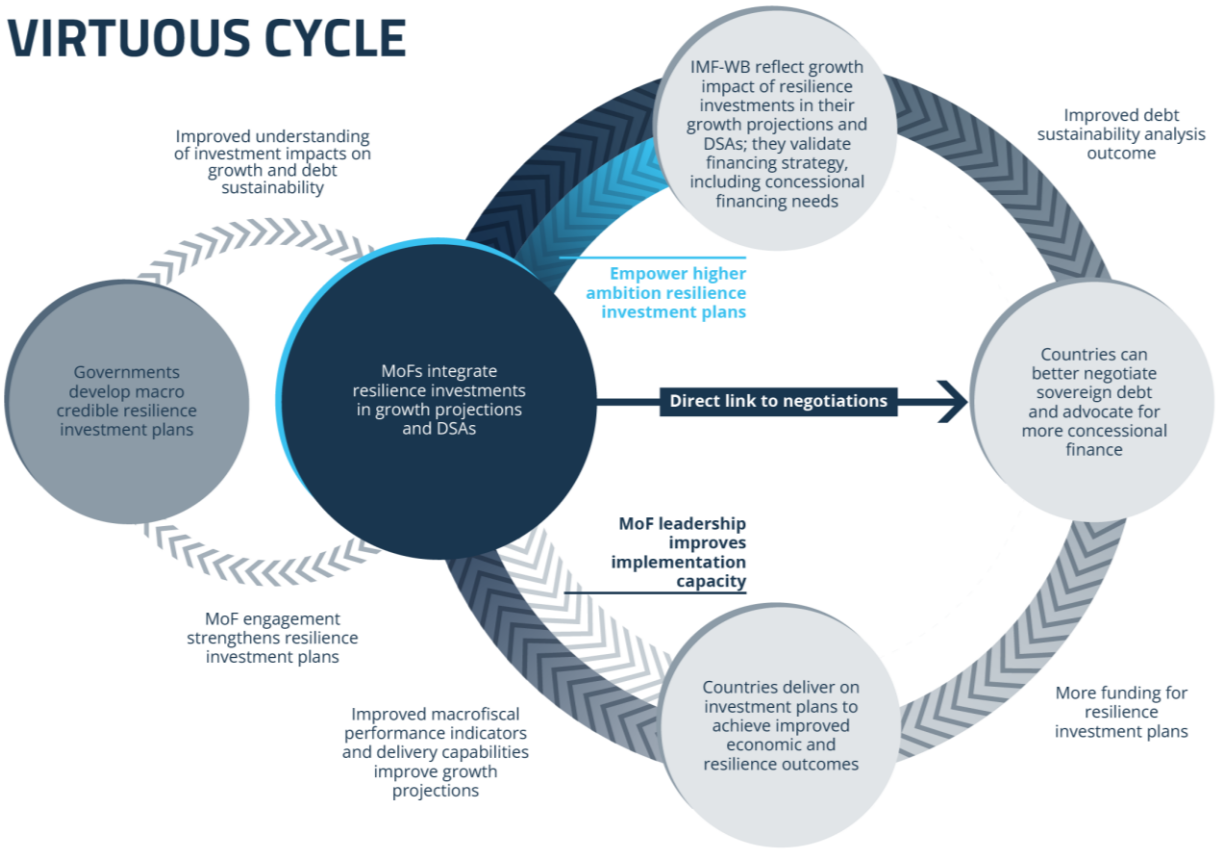
The analogy is not perfect. Climate and nature risks affect entire economies and require long-term, cross-sectoral investments. Public health investments were relatively discrete. Today's political landscape is more difficult: official development finance volumes are declining and climate action remains politically contested in some quarters. Unlike the public health crisis, urgency and consensus are still building.

Still, the core lesson applies. Countries that set out clear, costed resilience plans – aligned with IMF-endorsed growth and adjustment strategies – are more likely to attract concessional finance. This demand is not sufficient on its own, but it is essential to shift how resilience is financed and delivered.

- **Stronger recognition and alignment helps improve access to finance**, on terms that reflect the scale, long-term nature, and public-good character of these investments.
- **Resilience investments are delivered** – with stronger engagement of finance and other coordinating ministries – supporting economic and fiscal outcomes that reinforce the case for future investment.

Of course, none of this happens automatically. Progress on any one part of the cycle depends on action by others. Each step is necessary but not sufficient on its own for success. Even if a country demonstrates how resilience investments affect growth and debt trajectories, institutions like the IMF and World Bank may still need to evolve their methodologies to reflect this. Similarly, negotiating for more affordable, longer-term financing requires sound macrofiscal frameworks, but it will only succeed if that capital is made available in sufficient volume and with appropriate degrees of concessionality. And delivering large-scale resilience investments will require strong and long-term political focus, institutional capacity, effective leadership, and close coordination across government and with the private sector to ensure implementation is fast, efficient and effective.

Figure 17: A virtuous cycle to unlock finance for climate and nature resilience



Integrating climate and nature resilience investments into macrofiscal frameworks does not offer a silver bullet. This work is a pre-condition to establish credible country demand and strengthen the case for concessional finance. But unlocking resources and concessional finance at-scale will also require supply-side reforms, which the Bridgetown Initiative and others are actively pursuing. Critically, countries must demonstrate their ability to deliver: access to concessional finance depends not only on the strength of macrofiscal planning, but also on the track record of execution, which also affects a country's credibility in asking for additional resources. However, where this is a robust plan and a legacy of project delivery, countries stand a greater chance of securing funds.

Scaling investment in climate and nature resilience – and unlocking concessional finance to support it – is necessary for long-term, sustainable growth. But success also hinges on prudent fiscal management and institutional effectiveness. At a minimum, this means two things. First, countries need to establish a sustainable fiscal position so that resilience investments have the intended impact on growth. This includes anchoring fiscal policy around a credible long-term debt target and associated primary balance, and integrating resilience investments within this framework. Fiscal discipline is essential: without it, additional financing is not a real solution. Second, countries must address weaknesses in policy frameworks and institutional arrangements. This includes strengthening public investment management to ensure capital expenditure projects are identified on clear evidence and implemented under transparent procurement and competitive bidding processes.

While not sufficient on its own, integrating resilience into macrofiscal frameworks is a necessary step. It gives countries the evidence and tools they need to negotiate finance from a position of greater strength and to chart a path for continued economic growth and prosperity in the face of rising climate and nature risks.

4.

CALL TO ACTION AND NEXT STEPS

The objective of this paper is to help drive greater investments in climate and nature resilience by strengthening the call for increases in both domestic and international finance. It is clear that climate and nature risks are inseparable and macro-critical. Investment opportunities exist to mitigate some of the risks, but countries underinvest, in part because the benefits of these investments are not adequately recognized in growth and debt sustainability frameworks.

Many countries will need to significantly increase investments in climate and nature resilience to strengthen their economies and support human development. This paper estimates the additional cost of climate and nature resilience investments in EMDEs to be US$280 billion by 2030, equivalent to 0.48% of EMDE GDP in 2030,[43] though it is important to point out that there are significant differences in cost burdens within and between income groups. To make these investments affordable, there is no way around the need for more, cheaper and longer-term financing. But, as set out in this paper, to mobilize this finance, the economic need for and value of climate and nature investments must be recognized.

Coordinated action is critical. This paper integrates new and existing insights on climate and nature resilience investments. However, it is not the end-game but advances the groundwork for the technical and institutional efforts needed to drive reform. Indeed, there must be further, coordinated action across multiple stakeholders to take full advantage of the ongoing IMF and World Bank LIC-DSF review process:

- **Priority 1**
  In the lead-up to the IMF-World Bank Spring Meetings 2026, coalitions of finance ministers, such as the CVF-V20, G24, and CoFM, support country proof-points that demonstrate the macrofiscal benefits of climate and nature resilience investments.

- **Priority 2**
  In the lead-up to the IMF-World Bank Annual Meetings 2026, the IMF, World Bank, MDBs and other development partners (with the support of experts) develop growth methodologies that integrate the benefits of climate and nature resilience investments and user-driven tools for debt management offices to assess the relative growth and debt sustainability impacts of resilience investments more effectively and more efficiently – supporting integration into routine decision-making processes and financing discussions.[44] The IMF, World Bank and other development partners provide technical assistance facilities to support countries to undertake this work.

[43] The cost estimates are largely for public expenditure (see Section 2).
[44] The World Bank is beginning this work including through expansions to its Mitigation, Adaptation and New Technologies Applied General Equilibrium Model (MANAGE) to consider the growth and debt sustainability impacts of nature investments, including in mangroves, crop pollination and soil erosion.

- **Priority 3**
  As part of the LIC-DSF review process, the IMF and World Bank revise guidance for DSA frameworks to include the benefits of investments in climate and nature resilience and reflect the financing terms that permit these investments to be macro-feasible. This should start with the inclusion of alternative scenarios to assess climate and nature risks and investments. Insights from these country proof-points should also inform revisions to the DSA framework itself. We propose high-level reforms in Section 3, which will form the basis for Bridgetown Initiative engagement with the IMF and World Bank on this issue.

- **Priority 4**
  In the lead-up to COP30, climate and nature experts such as the United Nations Environment Programme (UNEP), International High-level Expert Group (IHLEG), the Network for Greening the Financial System (NGFS), and the Insurance Development Forum (IDF) among others, help refine the climate and nature risk framework, climate and nature resilience intervention typology and cost estimates set out in this paper, while also driving alignment with other ongoing initiatives. It will be important to update the cost estimates to cover the full typology of interventions and extend the investment outlook from 2030 to 2035 to provide a clearer picture of medium-term spending needs.