

# SOVEREIGN CLIMATE AND NATURE REPORTING

Proposal for a Risks and Opportunities Disclosure Framework



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1818 H Street NW, Washington DC 20433  
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Cover photo: A group of kids playing in flood water. Pekan, Malaysia. Credit: Azami Adiputera, Shutterstock



# Contents

<b>Acknowledgments</b>	<b>III</b>
<b>Acronyms</b>	<b>V</b>
<b>Executive Summary</b>	<b>VII</b>
<b>Introduction</b>	<b>1</b>
Macroeconomic Risks of Climate Change and Nature Loss	1
Background on Climate- and Nature-Related Financial Disclosures	2
<b>Why Is A Reporting Framework for Sovereigns Needed?</b>	<b>7</b>
Reason 1: Sovereign Reporting of Climate- and Nature-Related Financial and Economic Information Can Help Countries Attract Capital and Have “Spillover” Effects on Domestic Policy Making	7
Reason 2: There Is Growing Demand for Climate- and Nature-Related Financial Information by Investors	8
Reason 3: Existing Information Does Not Meet the Needs of Investors and Other Stakeholders	10
<b>What Is Required to Develop a Reporting Framework for Sovereigns?</b>	<b>13</b>
How Can Existing Frameworks Be Adapted for Sovereigns?	13
What Are the Information Needs and Who Are the Parties Responsible for Providing the Information?	15
Are There Other Potential Approaches to Developing A Sovereign Reporting Framework?	18
<b>How Is Materiality Important in Driving a Reporting Framework for Sovereigns?</b>	<b>21</b>
<b>What Is the Potential for Unintended Consequences?</b>	<b>25</b>
<b>What Are the Recommended Next Steps to Develop and Implement a Reporting Framework for Sovereigns?</b>	<b>27</b>

<b>Annex A: Draft Sovereign Climate and Nature Risk and Opportunities Reporting Framework</b>	<b>29</b>
<b>Annex B: Supplemental Information on Existing Corporate-Focused Reporting.</b>	<b>33</b>
Background on Task Force on Climate-Related Financial Disclosures	33
Background on Task Force on Nature-Related Financial Disclosures	39
<b>References</b>	<b>37</b>





## Acknowledgments

The World Bank task team responsible for this report was composed of Fiona Stewart (Lead Financial Sector Specialist, Long-term Finance), Samantha Power (Sustainable Finance Consultant, Long-term Finance), Baljit Wadhwa (Senior Operations Officer, Climate Change), and Monika Kumar (Environmental Specialist) with support from Mark Flugge (Expert Consultant), Stacy Swann (Climate Finance Advisors), and Darius Nassiry (Climate Finance Advisors). The report benefited greatly from the valuable contributions and perspectives of our colleagues in the climate change and green finance community, who have ensured its quality and clarity. These include Otilia Ciotau (Senior Financial Officer, CFO Advisor), Bryan Gurhy (Senior Financial Specialist, ENFLT), Lea Hakim (Senior Economist, MTI), Patrick Kabuya (Senior Financial Management Specialist, Governance GP), Svetlana Klimenko (Lead Financial management Specialist, OPCS), Olivier Mahul (Practice Manager, EFNRF, FCI GP), Rozani Osman (Senior Financial Sector Specialist, East Asia), and Gabriel Sensenbrenner (Lead Financial Sector Specialist, ELCFN). Greatly appreciated input also came from Heike Reichelt (Head Investor Relations), Scott Cantor (Senior Financial Officer), and other World Bank and Department of Treasury colleagues, including several from the pension team. Input was received from external experts, including Ian Carruthers and Ross Smith (International Public Sector Accounting Standards Board).

Suggested citation: Stewart, F., Power, S., Flugge, M., Wadhwa, B., Kumar, M., Swann, S., and Nassiry, D. (2021). Sovereign Climate and Nature Reporting: Proposal for a Risks and Opportunities Framework. Washington, DC: The World Bank Group.





Amazon river aerial view. Credit: Flickr





# Acronyms

ASCOR	Assessing Sovereign Climate-related Opportunities and Risks
CRAs	credit rating agencies
EMDE	emerging market and developing economies
ESG	environmental, social, and governance
FSAP	Financial Sector Assessment Program
G20	Group of 20
GHG	greenhouse gas
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IPSASB	International Public Sector Accounting Standards Board
ISSB	International Sustainability Standards Board
NAMA	nationally appropriate mitigation action
NAP	national action plan
NBSAP	national biodiversity strategy and action plan
NDC	nationally determined contribution
NGFS	Network for Greening the Financial System
PPP	public-private partnership
RPG	recommended practice guidelines
SASB	Sustainability Accounting Standards Board
SEEA	System for Environmental Economic Accounting
SIFMA	Securities Industry and Financial Markets Association
SOAS	School of Oriental and Asian Studies
SOE	state-owned enterprise
TCFD	Task Force on Climate-Related Financial Disclosures
TNFD	Task Force on Nature-Related Financial Disclosures
UNFCCC	United Nations Framework Convention on Climate Change
WBG	World Bank Group



In the Fulani village of Hore Mondji, located in southern Mauritania on the banks of the Senegal River, a women's cooperative uses solar energy to operate the borehole that supplies water to the market garden. Credit: Raphael Pouget / Climate Visuals Countdown





## Executive Summary

**The Paris Agreement states that addressing climate change will require “making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.”<sup>1</sup>** Policy makers, scientists, and investors recognize that the global economy must evolve to a more sustainable model that reduces its impact on the Earth, adapts to the changes already locked in, and contributes to carbon sequestration, as well as restoring and reconnecting degraded and fragmented ecosystems. To be successful, global financial flows must align with these broad objectives. More specifically, trillions of dollars of financing is needed to achieve the climate change mitigation and adaptation goals laid out in Articles 2.1.a and 2.1.b of the Paris Agreement, as well as the emerging targets of the Post-2020 Global Biodiversity Framework (UNEP-CBD). Investors will play an important role in driving this alignment through the tools of capital allocation and engagement. Sustainability reporting can play a central role in driving capital to sustainable investments and away from environmentally harmful ones.

**Progress has been made on corporate climate and nature reporting, but a significant information gap remains for sovereign entities, the capital-raising activities of which are not presently considered in existing climate- and nature-related disclosure frameworks.** Sovereign bonds make up almost 40 percent of the US\$100 trillion global bond market, and public funding and financing make up a significant proportion of global financial activity. International sustainability reporting frameworks under development, though, do not cover public sector investments, the issuance of sovereign and subsovereign bonds, the investments of public pension funds, or international development finance.

**Sustainability reporting is evolving quickly, making it even more imperative that sovereigns are not left behind.** Understanding and disclosing climate- and nature-related physical and transition risks, as well as opportunities for priority investments in adaptation and transition activities, is essential for sovereigns seeking to address vulnerabilities and avoid unsustainable debt burdens. Research from the IMF and others shows that both climate change and ecosystem loss have a material impact on sovereign risk through direct and indirect effects on public finances (Cevik and Jalles 2020a; Cevik and Jalles 2020b). It raises the cost of capital of climate-vulnerable countries and threatens debt sustainability. Material climate- and nature-related information is as important for assessing sovereign risk as economic data, and this information should be reported with the same rigor in order to provide investors and other decision makers with a more comprehensive country overview.

<sup>1</sup> UNFCCC, Paris Climate Agreement, article 2.1 (c) (December 12, 2015), [https://unfccc.int/files/meetings/paris\\_nov\\_2015/application/pdf/paris\\_agreement\\_english\\_.pdf](https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf)

**The purpose of this report is to raise awareness and initiate a discussion on the need for sovereign sustainability reporting.** The proposed sovereign climate and nature reporting framework would assist sovereigns looking to attract investment by enabling them to produce comprehensive, regular, standardized, and, eventually, forward-looking disclosures of their climate- and nature-related risks and opportunities. Sovereign reporting would help meet the needs of investors who are increasingly requesting such disclosures for all asset classes in their portfolios so that they can measure portfolio alignment with the Paris Agreement.

**This report discusses five fundamental questions regarding sovereign climate and nature reporting:**

(a) why is a sovereign reporting framework needed?; (b) what is required to develop a reporting framework for sovereigns?; (c) how is materiality important in driving a reporting framework for sovereigns?; (d) what is the potential for unintended consequences?; and (e) what are the recommended next steps to develop and implement a reporting framework for sovereigns?

**Sovereign reporting needs its own approach and framework.** A customized approach suited to the specifics of sovereign reporting is recommended. This could build on the core elements and underlying principles of existing corporate-focused frameworks such as the Taskforce for Climate-related Financial Disclosure (TCFD). Other frameworks such as context-based performance accounting and reporting frameworks and environmental-economic approaches could also be drawn upon, such as the UN System for Environmental Economic Accounting (SEEA) framework. Annex A to this report presents a draft example of a sovereign climate and nature risk and opportunities reporting framework as a starting point for discussion (noting that it is not intended as a fully developed template or blueprint).

**Estimates of the value of a country's natural assets would be a critical component of sovereign climate and nature reporting.** In addition to reporting on climate risks, there is a strong case for sovereigns to disclose nature-related criteria. A country's natural assets are critical to its economic growth and stability, and therefore should be accounted for and appropriately managed (Dasgupta 2021). The interaction between climate change and natural assets is increasingly relevant for sovereign bond investors, as the climate and biodiversity crises advance, create feedback loops, and reduce overall resilience.

Natural capital accounting can be a tool that countries can use to better measure their natural assets and integrate them into national planning and development decisions.

**The “materiality” of various climate- and nature-related criteria must be assessed to ensure that the framework best enables effective capital allocation and engagement by investors.** In general, materiality as it is used by preparers, auditors, and consumers of financial information is widely understood as related to information that is “decision-useful for the reasonable investor.” Climate change and the health of a country's ecosystems could be considered potentially significant factors for a sovereign's future financial and economic health and thus “material.” Some investors may consider both financial and sustainability materiality in determining relevant factors for their investment decision making (double materiality), and they may consider these factors along a spectrum that is shifting (dynamic materiality).

**Managing potential unintended consequences such as capital flight from emerging markets highly exposed to climate and nature risk is essential to wide adoption of a sovereign climate and nature reporting framework.** Emerging evidence shows that climate-related risks are already influencing the cost of capital, as evidenced by sovereign bond spreads (Volz et al. 2020). Financial markets now have much better access to information on climate risks than on the actions that countries have taken to mitigate and manage these risks through investment in adaptation and resilience. A deeper and more common understanding of both physical and transition risks related to climate and nature would ideally result in better policy outcomes and more effective pricing signals from the market. Climate and nature reporting can enable sovereigns to articulate their approach to managing relevant risks and give them greater ownership of the risk narrative presented to investors.

**Next steps to develop and implement this concept include a consultative process leading to the development of a reporting framework or guidance, followed by country pilots.** The authors invite the International Public Sector Accounting Standards Body (IPSASB)—the public sector partner of the International Financial Reporting Standards (IFRS) Foundation working on corporate sustainability reporting—to lead a consultative process to gain support for developing a framework for the public sector based on this concept. In parallel, World Bank teams will look for opportunities to

start to pilot and test reporting approaches through country-level engagements. Box ES.1 outlines how existing corporate-focused frameworks could be adapted for sovereign climate- and nature related disclosure.

### BOX ES.1 - How the Existing Corporate-Focused Frameworks Could Be Adapted for Sovereign Climate- and Nature-Related Disclosure

The existing recommendations are structured around four thematic areas that represent core elements of how organizations operate: (a) governance, (b) strategy, (c) risk management, and (d) metrics and targets. These pillars could be adapted for sovereign climate- and nature-related reporting.

**Governance.** Disclose the sovereign's governance around climate- and nature-related risks and opportunities. More specifically:

- Describe the sovereign's governance arrangements around climate- and nature-related risks and opportunities, including which ministries are tasked with identifying, assessing, quantifying, and managing climate- and nature-related financial and economic risks that the sovereign faces; and
- Describe government's role in assessing and managing climate- and nature-related risks and opportunities, including which policy or governing bodies (parliament, executive, or presidential offices) are responsible for guiding the work of ministries in managing climate- and nature-related risks and capturing opportunities to address climate- and nature-related risks (transition, physical, liability).

**Strategy.** Disclose the actual and potential impacts of climate- and nature-related risks and opportunities on the sovereign's economy, key economic sectors, and overall financial conditions. Disclose the strategy and financial planning a sovereign may pursue to address such issues, including national planning and financial management. More specifically:

- Describe the climate- and nature-related risks and opportunities that the sovereign has identified over the short, medium, and long terms; and
- Describe the resilience of the sovereign's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower temperature increase scenario for transition risk and current warming trajectories for physical risk.

**Risk Management.** Disclose how the sovereign identifies, assesses, and manages climate- and nature-related risks, including which ministries are responsible for ongoing risk assessment and tracking. More specifically:

- Describe the sovereign's processes for identifying and assessing climate- and nature-related risks;
- Describe the sovereign's processes for managing climate- and nature-related risks; and
- Describe how processes for identifying, assessing, and managing climate- and nature-related risks are integrated into the sovereign's overall risk management, financial management, and economic planning.

**Metrics and Targets.** Disclose the metrics and targets used to assess and manage relevant climate- and nature-related risks and opportunities where such information is material. More specifically:

- Disclose the metrics used by the sovereign to assess climate- and nature-related risks and opportunities in line with its country strategies (NDCs, NAMAs, NAPs, NBSAPs) and risk management process;
- Disclose sectoral and, if appropriate, trade-related greenhouse gas (GHG) emissions and the related risks; and
- Describe the targets used by the sovereign to manage climate- and nature-related risks and opportunities and performance against targets, as well as the way its targets are aligned with its NDC.

Source: Climate Finance Advisors 2021; TCFD 2017.

Note: NAMA = nationally appropriate mitigation action; NAP = national action plan; NBSAP = national biodiversity strategy and action plan; NDC = nationally determined contribution



The ICESCAPE mission, or “Impacts of Climate on Ecosystems and Chemistry of the Arctic Pacific Environment,” is NASA’s two-year shipborne investigation to study how changing conditions in the Arctic affect the ocean’s chemistry and ecosystems. The bulk of the research takes place in the Beaufort and Chukchi seas in summer 2010 and 2011. Credit: NASA/Kathryn Hansen





# Introduction

## Macroeconomic Risks of Climate Change and Nature Loss

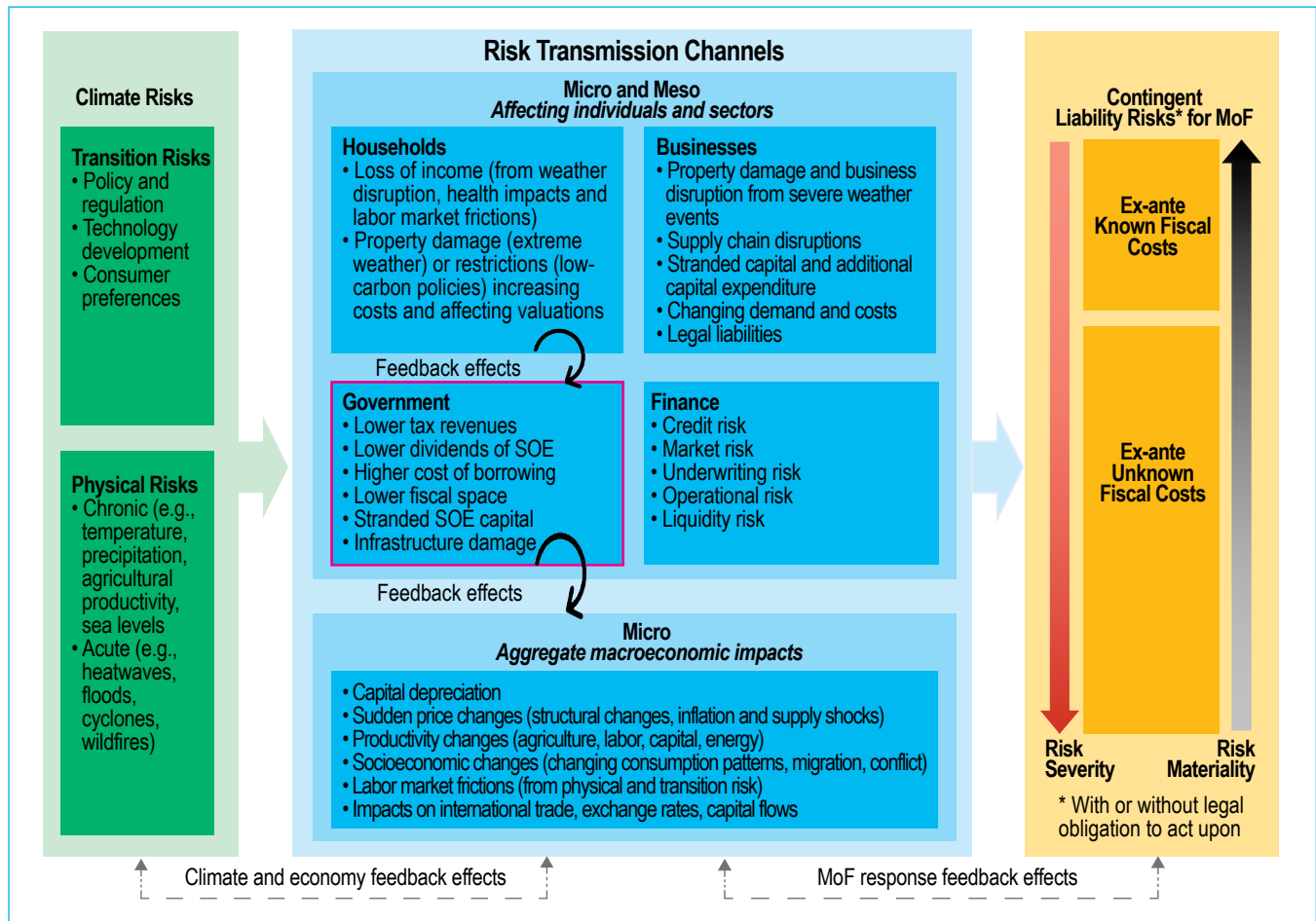
**In recent years, the physical impacts of climate change, particularly on emerging economies, have become increasingly clear.** The latest Intergovernmental Panel on Climate Change (IPCC) report states that it is unequivocal that human activity has warmed the atmosphere, ocean, and land and that human-induced climate change is already affecting many weather and climate extremes in every region across the globe (IPCC 2021). Governments also need to accelerate investments in adaptation and resilience to climate impacts, both those impacts being faced today and those expected in the future given already locked-in warming.

**Despite this mounting evidence, the analysis of how those risks transmit through economies and how they manifest in terms of financial costs is still in a relatively early stage.** Every country will need to assess how its own economic health is currently being affected and may in the future be impacted by climate-related risks. Whether and how countries address these risks could have material effects on a country's overall sustainability and economic growth and is likely to pose material risks for investors with exposure to the debt issued by these countries.

**Climate change affects countries' cost of borrowing through a range of transmission channels.** As economists have begun to analyze the interactions between physical climate impacts, including acute and chronic impacts and transition risks such as policy, regulatory, and technological changes, a better understanding of the transmission channels of climate risks for sovereign issuers is developing (see figure 1). When and to what magnitude such risks manifest, though, remains difficult to predict with precision in terms of size, scope, or timing (Beirne, Renzhi, and Volz 2020).

**Pursuing a development pathway not aligned with Paris can and will continue to be fiscally expensive for all sovereigns, not only in the long run but also in the short term.** Some countries are already experiencing increasing costs, losses, and damages because of impacts occurring today. For countries that issue debt, in domestic or international capital markets, a physical, climate-related shock can have long-term impacts on a country's ability to attract capital for investment, including for climate mitigation and adaptation. Furthermore, a country's overall plan to transition to a low- or zero-carbon energy mix will be important information for sovereign bond holders and other investors who may wish to understand more fully that investment's exposure to transition risks.

**FIGURE 1 - Climate-Related Risks Relevant for Ministries of Finance (transmission channels)<sup>2</sup>**



Source: Dunz and Power 2021.

Note: MoF = ministry of finance; PPP = public-private partnership; SOE = state-owned enterprise.

**While analysis of the macroeconomic risks associated with nature loss is more nascent, the available literature indicates that potentially significant losses in GDP could stem from losses of ecosystem services.** This is the clear message in a recently published joint Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and IPCC report (IPBES-IPCC 2021). Recently published World Bank research based on an integrated global economic-ecosystem model estimates that the collapse of select ecosystem services provided by nature could result in a decline in global GDP of US\$2.7 trillion annually by 2030. The findings underscore the strong reliance of economies on nature, particularly in low-income countries. The report highlights that Sub-Saharan Africa and South Asia would suffer the most relative contraction of real GDP due to a

collapse of ecosystem services by 2030: 9.7 percent and 6.5 percent annually, respectively (World Bank 2021a).

## Background on Climate- and Nature-Related Financial Disclosures

**While corporate climate-related disclosures have been seen as an important contribution to investor information, they are not yet considered sufficiently consistent, comparable, or complete enough to provide decision-useful risk information for investors or policy makers tracking progress against the Paris goals.** External analysis is starting to highlight areas where those disclosing may be falling short, including regarding tracking emissions and credit and financial risks. A recent CDP report notes significant underreporting

<sup>2</sup> Contingent liabilities are defined as obligations (with or without legal obligation to act upon) that only materialize when a certain event in the future occurs. Contingent liability risks could become gradually or abruptly more severe with ongoing climate change (depending on the specific country context), as indicated by the red “risk severity” arrow. The materiality of these risks depends on the interplay of climate-related risk transmission channels and the degree of unfavorable reinforcing feedback loops, though, as is indicated by the gray “risk materiality” arrow.

by financial institutions in portfolio emissions by as much as 700 percent and furthermore that such institutions dramatically underestimate climate-related risks by focusing primarily on physical damages to operations rather than on defaults on loan repayments, stranded assets, or financial asset price devaluation (CDP 2021). These gaps in existing disclosures underscore that more work is needed, particularly in areas related to metrics and targets.

**Despite the challenges that still exist, there is evidence that existing climate-related financial disclosure frameworks are taking hold in financial markets.** Investors are increasingly using these frameworks as a basis for inquiry and due diligence, and each of the major credit rating agencies (CRAs) now actively inquire about climate-related risks when engaging with issuers (IPBES-IPCC 2021). The leading global reporting entities, for example, have proposed a prototype sustainability reporting framework based on the Task Force on Climate-related Financial Disclosures (TCFD) for the International Financial Reporting Standards (IFRS) to consider as global, harmonized reporting standards are developed in future years (IMP, WEF, Deloitte 2020). As more organizations begin to apply a framework for climate-related due diligence and the communities of investors, policy makers, and others improve upon these frameworks to enable the disclosure of more consistent and comparable climate-related financial risk information, the utility and impact of climate- and nature-related disclosures will only increase.

**Under the Paris Agreement, Article 2.1.c states the aim of “making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development”** in order to reach the goal of maintaining the increase in global average temperatures to well below 2°C (UNFCCC 2015). To meet this objective and redirect financial flows, governments must shape the policy and regulatory environment that determines whether or not the private sector will direct capital in a way that transitions to a low-carbon economic model within the relevant timeframe. As both public and private action are required to achieve the goals of the Paris Agreement, there is a strong case to be made that applying the disclosure of climate-related risks and opportunities only to organizations (financial institutions and nonfinancial firms) may be insufficient.

**Sovereign bonds are the largest asset class and are a preferred investment of institutional investors around the globe.** In some countries, where private sector investment and markets are nascent, sovereign investment is the primary source of capital being deployed. As institutional investors take steps to integrate climate and environmental, social and governance (ESG) criteria more broadly across their portfolios (Shammai et al. 2020), issues with sovereign ESG data (related to availability, quality, timeliness, and comparability) serve as a major barrier to effective risk management (Inderst and Stewart 2018). Sovereign “Environment” I data is particularly problematic. Among the E, S, and G categories, E-category data has the longest time lags (Shammai et al. 2020) and the greatest divergence in scores among the major ESG data providers (Boitreaud et al. 2020). E-category risks are of increasing concern to investors (WEF 2020), particularly long-term investors like sovereign bond holders, and are rapidly changing (UN 2020).

**Given the broad and increasing market uptake of existing corporate-focused frameworks for assessing and disclosing climate risks and opportunities, the potential impacts of climate change on countries, and the relevance of sovereign economic conditions to investors, can a framework be developed for sovereigns?** As the need for disclosure of climate-related risks and opportunities for corporates and investors has become widely recognized, there has been a growing recognition that disclosure of climate change risks is not only needed from private organizations but could also be relevant for sovereign issuers.

**Given the broad acceptance of existing corporate-focused frameworks by investors, it may make sense to apply as much of these frameworks and recommendations as possible with adaptations as necessary for the sovereign context.** Annex B provides further information on corporate-level reporting. Sovereign reporting would be based on the same principles and with a focus on parameters that are material for both sovereign sustainability and, therefore, investors. Many of the main areas of corporate-focused reporting are relevant to sovereigns—governance, strategy, risk management, and metrics and targets—and could be applied in the sovereign context. The following sections outline specific reasons for developing a framework for sovereign climate and nature-related reporting.

**While there is a case for nature-related criteria to be disclosed by sovereigns, alongside climate criteria, it is important to note that climate- and nature-related risks (and opportunities) are distinct.** From an economic standpoint, natural capital—stocks and changes in stocks of environmental assets—is an asset that sovereigns should maintain and manage, whereas a changing climate presents a broader threat (or opportunity) to sovereign assets. Distinct approaches (environmental-economic accounting) are appropriate for determining the risks and opportunities associated with

a sovereign's natural environment and its contributions (that is, ecosystem services) to the sovereign's society and the economy.

**While climate-related disclosures by sovereigns are not yet widespread, some countries have published reports and disclosed a measure of climate-related risks and opportunities.** See boxes 1 and 2 for two cases where a sovereign has discussed its climate-related risks as part of such an issuance.

## BOX 1 - Costa Rica as a Pioneer in Public Accounting and Sustainability

Costa Rica has pioneered the adoption of International Public Sector Accounting Standards (IPSAS) in Latin America. Costa Rica began the process of converting its national accounting from a budget approach to an accounting framework 10 years ago and has implemented this transformation because of commitment from its leadership and with support from partners, including the Inter-American Development Bank.

### Public Sector Disclosure

The current implementation plan calls for full implementation of IPSAS by year-end 2021. Costa Rica faced challenges with implementation, including institutional barriers. The main benefit of implementation of IPSAS has been the real-time provision of reliable and comparable information, as well as improvements in transparency and accountability. The adoption of IPSAS positions enables Costa Rica to gain a better sovereign credit rating and makes it less susceptible to downgrades.

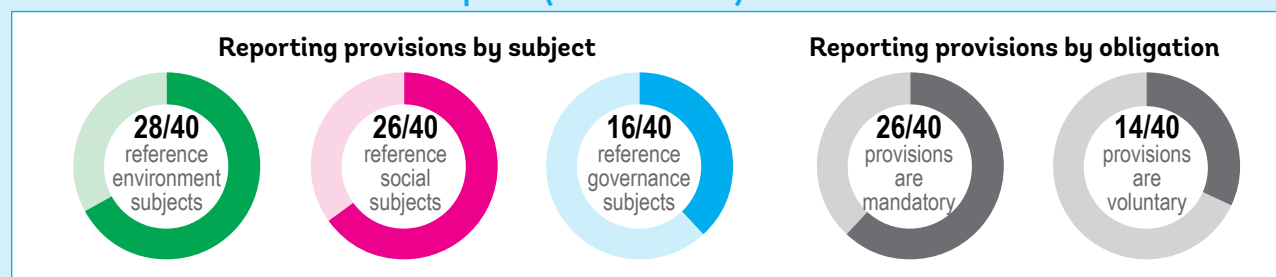
Moreover, as is mentioned in box 4, there are three nonmandatory Recommended Practice Guidelines (RPGs) that IPSASB has developed for use alongside the IPSAS that are relevant to climate change reporting. When implemented, these will help Costa Rica to account for and disclose the impacts of climate risks and strengthen its creditworthiness and financial transparency.

### Private Sector Disclosure

In addition to reforms in public sector accounting, Costa Rica has also pioneered sustainability reporting in the private sector. There is a significant interest in sustainability reporting in the country, as there are currently 40 reporting requirements and resources for ESG-related issues, driven in part by Costa Rica's bid to join the Organization for Economic Co-Operation and Development (OECD), which it accomplished in May 2021.

Costa Rica does not currently have a specific sustainability reporting requirement for private or public companies to publish sustainability reports, but there are reporting requirements that ask companies to disclose certain information in relation to ESG issues, according to the World Business Council for Sustainable Development (WBCSD).

**FIGURE B1.1- Costa Rica Data Snapshot (WBCSD 2018)**



Source: IPSASB 2014; IPSASB 2020; OECD 2021; WBCSD 2018a.  
Note: ESG = environmental, social, and governance.



## BOX 2 - New Zealand as a Pioneer in Environmental Reporting and Sustainability

New Zealand passed a first-of-its-kind Environmental Reporting Act in 2015. The act makes responsibilities for environmental reporting explicit and sets the framework for the scope and timing of environmental reporting. The government statistician (StatsNZ) and the Ministry for Environment report on the state of different aspects of the environment every six months, and the environment as a whole every three years. The act demands the involvement of the StatsNZ, which ensures that reporting is conducted at arm's length from the government of the day and released in line with principles and protocols set by the act. Moreover, the parliamentary commissioner for the environment can comment on any aspect of reporting, which provides a further degree of independence.

### Public Sector Disclosure

Under the act, environmental reporting is organized into five domains along with a set of topics to identify key issues within each domain and across domains, as well as indicators to provide measures of each topic. The five reporting domains are:

- Air
- Atmosphere and climate
- Fresh water
- Land
- Marine

Information on biodiversity and ecosystem features is provided in the land, fresh water, and marine domains. The domains are sufficiently broad to accommodate those aspects of the environment that are important internationally and domestically. Publishing information by domain allows New Zealand to build a comprehensive picture about the state, impacts, and pressures across each domain. This picture is built upon in the thrice-yearly synthesis reports. The topics to be reported on for each domain are set in the Environmental Reporting Regulations 2016:

- State topics describes the broad aspects of the condition of the domain
- Pressure topics describes the main sources of pressure on each domain
- Impact topics cover the impacts in the areas of ecological integrity, public health, the economy, te ao Māori (the Māori world view), and culture and recreation.

### Private Sector Disclosure

On April 12, 2021, the New Zealand government introduced an omnibus bill into parliament that aimed to implement mandatory reporting requirements for financial institutions related to the climate-related risks they face and their strategies for managing risks and opportunities. Disclosures would be made on a “comply-or-explain” basis in the public annual financial filings for each business, meaning that where there is insufficient information to allow a disclosure, reporting organizations can explain rather than disclose.

The entities in New Zealand that are required to make disclosures under the climate bill are

- All registered banks, credit unions, and building societies with \$NZ 1 billion or more in assets;
- All managers of registered investment schemes and crown financial institutions with \$NZ 1 billion or more in assets under management;
- All licensed insurers with greater than \$NZ 1 billion in assets under management or annual income more than \$NZ 250 million; and
- All companies listed on the New Zealand Stock Exchange.

The climate bill was reported from the Economic Development, Science, and Innovation Committee on August 16, 2021. For its second reading, the House will debate the select committee report and vote on the bill.

Source: New Zealand Ministry for the Environment 2021





A child rides a water buffalo through a meadow. Inle Lake, Myanmar. Credit: Samantha Power





# Why Is a Reporting Framework for Sovereigns Needed?

## Reason 1: Sovereign Reporting of Climate and Nature-Related Financial and Economic Information Can Help Countries Attract Capital and Have “Spillover” Effects on Domestic Policy Making

**Disclosure of climate-related risks and opportunities can help ensure a country’s continued ability to access capital markets for investments, including for priority investments in adaptation and transition activities.** The overarching rationale at the sovereign level for reporting on climate and nature-related risks and opportunities is to ensure that a clear, consistent level of financial and economic risk information is available on an ongoing basis to all types of users, including investors, policy makers, regulators, donors, and development finance organizations. Such information would be important for a range of stakeholders within the sovereign to enable better-informed policy and public investment decisions. Such a framework would provide investors with more granular, consistent, and comparable information on country-level risk and opportunities. Information related to metrics and targets can be applied in investor risk and opportunity analysis.

**This reporting can help international policies and financial flows better support the transition of countries to a low-carbon, climate-resilient, nature-positive future.** By adopting a reporting framework for sovereigns that builds on the core elements of recommended climate-related financial disclosures from corporate-based counterparts, countries will have an opportunity to augment existing information, policies, and reporting to more accurately and effectively assess and communicate their climate and nature-related financial and economic risks, opportunities, and management approaches.

**In addition, sovereign reporting of climate and nature-related financial and economic information could also have benefits for policy making at the national level, which help improve governance and ultimately the cost of capital.** Sovereign reporting has the potential to help reduce the risk of climate and nature-related financial shocks by providing specific, relevant information on both physical and transition risks on the horizon before they manifest and enable policy makers to better manage these risks. Reporting and scenario analysis process can provide governments with a more comprehensive picture of the risks and opportunities that their country faces, and collated information in the report can feed into relevant discussions in the Ministry of Finance, Parliament, and the executive branch. Better governance of these material risks should eventually be reflected in a lower cost of capital.

**Sovereign reporting of climate and nature-related financial and economic information can also help inform a country's own strategic approach to its spending and capital mobilization.** More efficient allocation of public budgets may be possible if policy makers have more comprehensive climate and nature-related information on both risks and opportunities that can be used to take a more strategic approach to maximizing the climate and nature impact of the public balance sheet. Understanding how climate and nature-related risks result in financial and economic costs will be important for planning and may determine how and where public funds are invested, particularly for priorities that may not attract private capital but where the societal benefits are significant.

**For those managing sovereign budgets and allocations, having a better understanding of climate and nature-related risks and future damages may facilitate a better understanding of where best to apply public funding and where it is possible mobilize private funding, as well as how to tap into both domestic and international private capital.** Taken together, understanding climate- and nature-related financial and economic risks could help sovereigns undertake a more efficient national public budget allocation process that delineates between projects that are purely public (including nature-based solutions), those that have the possibility for revenues streams that can attract private finance, and those that may require hybrid or public-private partnership approaches (WEF 2019).

**A reporting framework for sovereigns could provide a way to facilitate policy coherence at the national and subnational levels and ensure consistency between the climate pledges of countries by using NDCs and managing their approaches to contending with the low-carbon transition and physical risks to their economy.** While NDCs provide helpful information about a country's level of ambition and priority areas of action, there is a clear need for a framework that can ensure that national climate and nature-related financial and economic risks are aligned with a country's Paris-related investment strategies, including national emission reduction commitments. There is also a need to reduce the risks associated with the adverse impacts of climate change. More specifically, information from sovereign-level climate- and nature-related disclosures can allow investors and the international community to understand the range of financial and economic risks a country

faces due to a changing climate and loss of biodiversity and ecosystems, as well as how a country is seeking to address those risks at the national level. This information would also enhance the potential for a climate reporting framework to provide a way to assess policy coherence on climate change, nature conservation and restoration, and the degree to which these considerations are mainstreamed in public policies.

**Reporting by sovereigns may also help to boost other disclosures such as corporate climate and sustainability disclosures by providing a reference standard.** Sovereigns are usually the major issuer in their domestic markets, particularly in developing economies. By committing to report themselves, sovereigns can signal and support such reporting by corporations in their jurisdiction. Such signaling could induce positive spillover effects among their peers and can further boost efforts to ensure that climate considerations are integrated across all parts of the financial system.

## **Reason 2: There Is Growing Demand for Climate and Nature-Related Financial Information by Investors**

**Demands by investors (particularly purchasers of sovereign bonds) for climate, nature, and broader ESG-related information and investor flows that form a significant source of foreign direct investment are growing.** Credit ratings agencies and sustainability research firms have expanded their offerings as investor interest, including by institutional investors in sustainability, climate, and nature-related investments, has increased in recent years.

**There is growing interest in climate and nature-related risk and opportunities reported by sovereigns, and this information is increasingly being used in investment decision making.** Sovereign bonds are not only a preferred asset class for institutional investors but are also the largest asset class for these investors globally. The total global bond market capitalization was US\$123.5 trillion in 2020 compared with total global equity market capitalization of US\$105.8 trillion in 2020, according to the Securities Industry and Financial Markets Association, or SIFMA (SIFMA 2021). Sixty-eight percent of the global bond market was made up of sovereigns, supranational, and agency bonds, according to the International Capital Market Association (ICMA 2020). As of October 30, 2021, all outstanding bonds totaled US\$108 trillion and



all sovereign bonds totaled US\$39 trillion, based on data from Dealogic (SIFMA 2021). In other words, sovereign bonds make up almost 40 percent of the global bond markets.

**In the past few years, investors, particularly those under pressure to align their portfolios with the Paris Agreement, have been actively signaling their intent to reallocate assets and develop investment strategies that take ESG and climate-related information into account when building portfolios (Wissenburg et al. 2021).** For example, the Glasgow Financial Alliance for Net Zero (GFANZ) announced at the United Nations Framework Convention on Climate (UNFCCC) COP26 that financial institutions managing over US\$130 trillion of private capital had committed to aligning their portfolios with keeping warming below 1.5°C (GFANZ 2021).

**These and other considerations underscore the fact that ESG considerations are no longer a niche topic for institutional investors in emerging market sovereign debt,** even as the level of penetration of ESG into emerging market sovereign debt investing remains mixed. While institutional investors are actively taking steps to integrate ESG criteria across their portfolios using ESG frameworks and taxonomies, there is a growing demand for higher quality, granular, consistent, comparable, and standardized climate- and nature-related information that tracks multiple timeframes, including short, medium, and long-term (Foster 2019).

**Notwithstanding the rise in popularity of ESG investing, investors of various types continue to**

**express concerns about the validity and veracity of ESG information from corporates and other issuers (Bloomberg 2019).** Investors have been seeking some form of standardization in these reporting frameworks for some time, and as noted in a 2020 Blackrock survey, most survey respondents cited poor quality or availability of ESG data and analytics as the biggest barrier to deeper or broader implementation of sustainable investing (Blackrock 2020). Recent analysis by Bloomberg revealed that the ratings provided by one of the largest index providers and ESG rating companies, MSCI, only considers risk to companies and not the risks those companies pose to the environment and society (Simpson, Rathi, and Kishan 2021).

**Investor demand for consistent standards has led to an increase in efforts by international standards bodies to refine and revise reporting frameworks and approaches. This has also resulted in greater collaboration among these entities to align and harmonize approaches** to metrics, methodologies, and approaches to defining ESG relevant data. In April 2021, for example, the Board of the International Financial Reporting Standards (IFRS) Foundation published proposed amendments to their constitution to accommodate the potential formation of a new International Sustainability Standards Board (ISSB) within the governance structure of the organization (IFRS 2021). The ISSB issued its 'Prototype Disclosures' guidance at COP26 in November 2021, which used the TCFD's core elements of recommended climate-related financial disclosures as a basis (see figure 2) (IFRS 2021).

**FIGURE 2 - Core Elements of Recommended Climate-related Financial Disclosures**



Source: TCFD 2017,

Furthermore, addressing the demand for both sustainability and climate- and nature-related information has been a recurring theme in recent years and has been a focus of numerous financial policy-making bodies and associations, including central bankers (Network for Greening the Financial System, or NGFS), securities regulators (International Organization of Securities Commission, or IOSCO), Ministries of Finance (the Coalition of Finance Ministers for Climate Action), and others. Some of the more important information needs these bodies have found are those related to the inputs to climate-related financial information, such as how to apply physical warming scenarios to financial risk analysis, how to understand and apply analysis over varying time horizons, understanding how climate-related impacts affects value-at-risk, and transition scenarios. These same challenges also apply to sovereign level ESG- and climate-related information that can be useful for investors, policy makers, and financial regulators.<sup>3</sup>

### Reason 3: Existing Information Does Not Meet the Needs of Investors and Other Stakeholders

While demand for climate-related financial and economic information has been growing, the existing information on climate-related risks and opportunities is insufficient to enable robust climate-related investment decision making, particularly with regard to understanding climate-related risks, whether by investors, country policy makers or financial system regulators. Much of the existing sustainability information on sovereigns, for example, is provided ex post, and information that does forecast the future often lacks a clear articulation of various warming scenarios. Furthermore, while good information may be available for social and governance aspects, environmental information is often limited to emissions and footprints, although even within these data, some inconsistencies exist in methodologies, such as between consumption and production, scope emissions (Gratcheva, Emery, and Wang 2021). In the case of green bonds, the focus has historically been on mitigation investments, and the green bond label has provided investor comfort through mitigation-related information provided to justify the label, and so climate-related risk information is limited.

These informational issues pose a major barrier and can make it more difficult for investors to align their capital allocation approaches with their unique investment return requirements over the short, medium, and long term in a way that is consistent with global policy goals. Moreover, these informational issues also represent a barrier to effective risk management by investors. More specifically, for information to be decision-useful, it will need to provide

- Clarity on how climate and nature risks are addressed in sovereign policies, regulations, plans, strategies, and budgets, and how these risks impact economic and financial health of sovereigns;
- Information in both financial and economic terms and needs that are to be quantified over periods meaningful for investor decision making, including short-, medium-, and long-term periods;
- Regular updates to enable monitoring both by investors and regulators and ways to track changes in climate and nature-related risks and resilience that in turn can enable the valuation of the benefits of sound policy, investments (public and private), and economic resilience to climate change impacts and provide value to regulators; and
- Context, including limits or thresholds for climate and nature-related criteria aligned with ecological boundaries.

For some investors, understanding the climate and nature-related risks facing a sovereign may also imply understanding not only public investments at the asset level, but also broader investments in resilience. This would include community resilience and associated public-policy investments in resilience, such as for nature-based adaptation investments (protected areas, ecosystems that help enhance resilience or reduce climate-linked vulnerability).

Some critical information about climate and nature-related risks, opportunities, and management approaches is already publicly available in a country's related strategies and plans, such as NDCs, NAMAs, NAPs, and NBSAPs. NDCs, for example, focus on climate change mitigation, adaptation, and nature-related protection plans by parties to the UNFCCC, and in some

<sup>3</sup> See the World Bank Sovereign ESG Data Portal (<https://datatopics.worldbank.org/esg/>) and the IMF Climate Change Indicators Dashboard (<https://climatedata.imf.org/>).

cases also include their estimated costs. Most NDCs, though, focus on a country's contribution to reaching the objectives of articles 2.1.a and 2.1.b of the Paris Agreement and do not address Article 2.1.c. A country's NDC and other country-level plans such as NAPs and NBSAPs typically lack quantitative information related to climate or nature-related financial or economic risks except in rare cases over the long term such as plans for 2100 or 2050 or an investment pipeline or capital-raising plan associated with mitigation and adaptation goals. A framework for sovereigns could address these shortcomings by providing market-oriented information about the investment requirements for meeting the country's GHG emissions reduction and adaptation and resilience goals. It could also include the country's capital-raising plans to finance these investments.

**As noted in a recently published World Bank paper, the integration of sustainability criteria in investment decision making has been partially driven by the growing demand for the financial sector to play a greater role in the transformation of the current economic model into a more sustainable one.** Despite the growing adoption of sustainable investing practices in the corporate bond and equity space, market participants continue to grapple with how best to adapt their ESG frameworks for sovereign bonds. Analysis indicates that there is broad agreement among sovereign ESG data providers on what constitutes a "good" sovereign social and governance performance but highlight that there is little agreement on what constitutes a good sovereign environmental performance. Analysis found an ingrained income bias in sovereign ESG scores, which may be driving convergence (Gratcheva, Emery, and Wang 2021). This has two significant effects. First, an ESG-tilted sovereign bond portfolio will inevitably allocate funds toward richer countries. As a result, ESG investing may be driving capital away from low-income countries and widening funding gaps to reach climate and nature

goals. Second, developing countries are not incentivized through sovereign borrowing rates to improve their ESG scores. Higher quality information can help reduce the mispricing of climate risks, particularly for developing countries, where transparent and reliable information may currently be more difficult to obtain.

**The role of nature in a sovereign's management of climate-related risks and opportunities is important.**

There is growing awareness that effective climate risk management requires consideration of interactions at the climate-nature nexus, and the financial implications of failing to manage such risks. Indeed, finance ministries and central banks are starting to look at how to expand the scope of environmental risks they manage to include nature-related risks, including by considering interactions at the climate-nature nexus. Emerging examples of countries and investors supporting nature-based solutions (NBS) are beginning to show how such investments can help to reduce future financial losses from climate impacts. NBS are defined as "actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits." NBS and ecosystem services are worth an estimated US\$125 trillion annually, with more than half of global GDP "moderately" or "highly" dependent on nature-linked activities, according to the World Economic Forum. NBS investments include activities such as protecting, managing, and restoring forests; adopting "regenerative" approaches to agriculture; building artificial wetlands within cities to reduce flooding; managing watersheds to provide clean water; and restoring mangroves to mitigate storm damage.

**In summary, sovereign reporting offers benefits to sovereigns, investors, and others.** Table 1 shows how a sovereign climate and nature reporting framework could potentially benefit sovereigns, investors, and other stakeholders.

**TABLE 1 - Potential Benefits to Stakeholders from a Sovereign Climate and Nature Reporting Framework**

Entity	Potential Benefits
Sovereigns	<ul style="list-style-type: none"> <li>■ Improved access by countries to capital from a broad range of investors</li> <li>■ Better internal understanding of climate- and nature-related risks that could affect the country's future, could have governance benefits, and ultimately impact the cost of capital</li> <li>■ Equipping a country with the ability to shape the narrative on its risk management and opportunities</li> <li>■ Improved ability for countries to identify, prioritize, and invest public capital in ways that will enhance resilience</li> <li>■ Setting of example to help spread private sector sustainability reporting</li> </ul>
Investors	<ul style="list-style-type: none"> <li>■ Improved ability to price climate- and nature-related risk more accurately</li> <li>■ Improved ability to identify opportunities to invest in adaptation and resilience projects and services</li> <li>■ Improved information on which to engage with sovereigns to encourage improved risk management and realization of opportunities</li> </ul>
Other actors (e.g., credit rating agencies)	<ul style="list-style-type: none"> <li>■ Better information about credit risks affecting the country, subnational entities, and corporates</li> <li>■ Better visibility on steps countries take that can enhance their resilience and attract capital from investors</li> </ul>

Source: World Bank.



# What Is Required to Develop a Reporting Framework for Sovereigns?

## How Can Existing Frameworks Be Adapted for Sovereigns?

**Global sustainability and integrated reporting organizations have published a prototype climate-related financial disclosure standard (led by the IFRS Foundation) (IMP 2020).** CDP, the Climate Disclosure Standards Board, the Global Reporting Initiative, the International Integrated Reporting Council, and the Sustainability Accounting Standards Board (SASB), together with the IFRS, have coauthored an illustration of how their current frameworks, standards and platforms, and the structure of the TCFD framework can be brought together to provide a foundation for the development of global corporate sustainability standards.

**Based on the adoption and implementation of existing corporate-focused recommendations by companies and investors, there is an argument that the existing frameworks, which are based on the four pillars of governance, strategy, risk management, and metrics and targets, could be applied to sovereign issuers as well with appropriate modifications.** Box 3 outlines how the existing recommendations for organizations could be adapted for sovereign climate- and nature-related disclosure. Investors and other stakeholders interested in understanding climate-related financial and economic risks of sovereigns, particularly those with a sustainability investment strategy, will want to know, for example

- The physical and transition risks the country is exposed to on a variety of time horizons (today, tomorrow, in five years, and future points in time such as 2030, 2040, and 2050);
- The rate of change of these risks under different warming and policy scenarios;
- The country's vulnerability and exposure to economic, financial, and fiscal ramifications of the physical and transition risks;
- The physical and financial mechanisms in place to reduce vulnerability to losses and damages;
- The level of exposure of key industries to transition risks such as changes in policy, technology, and consumer preferences;
- The potential secondary effects of a physical risk shock to the country;
- The level of awareness of the country's leadership of the country's exposure to climate-related risks, the availability to national leadership of mechanisms for assessing and monitoring these risks, national leadership's understanding of changes in risk profile,



- and its use of such information in policy making and budgetary planning;
- The ways in which the country's sustainability and climate goals address these risks;
- The financial investments required to address these risks;
- The ways in which addressing these risks can help sector and economic growth; and
- The country plan's for mobilizing private investment to meet its climate and nature targets.

### BOX 3 - How the Existing Corporate-Focused Frameworks Could Be Adapted for Sovereign Climate- and Nature-Related Disclosure

The existing recommendations are structured around four thematic areas that represent core elements of how organizations operate: (a) governance, (b) strategy, (c) risk management, and (d) metrics and targets. These pillars could be adapted for sovereign climate- and nature-related reporting.

**Governance.** Disclose the sovereign's governance around climate- and nature-related risks and opportunities, more specifically:

- Describe the sovereign's governance arrangements around climate- and nature-related risks and opportunities, including which ministries are tasked with identifying, assessing, quantifying, and managing climate- and nature-related financial and economic risks the sovereign faces
- Describe government's role in assessing and managing climate- and nature-related risks and opportunities, including which policy or governing bodies (Parliament, executive, or presidential offices) are responsible for guiding the work of ministries in managing climate- and nature-related risks and capturing opportunities to address climate- and nature-related risks (transition, physical, liability)

**Strategy.** Disclose the actual and potential impacts of climate- and nature-related risks and opportunities on the sovereign's economy, key economic sectors, and overall financial conditions. Disclose the strategy and financial planning a sovereign may take to address such issues, including national planning and financial management, more specifically:

- Describe the climate- and nature-related risks and opportunities the sovereign has identified over the short, medium, and long term
- Describe the resilience of the sovereign's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario for transition risk and current warming trajectories for physical risk

**Risk Management.** Disclose how the sovereign identifies, assesses, and manages climate- and nature-related risks, including which ministries are responsible for ongoing risk assessment and tracking, more specifically:

- Describe the sovereign's processes for identifying and assessing climate- and nature-related risks
- Describe the sovereign's processes for managing climate- and nature-related risks
- Describe how processes for identifying, assessing, and managing climate- and nature-related risks are integrated into the sovereign's overall risk management, financial management, and economic planning

**Metrics and Targets.** Disclose the metrics and targets used to assess and manage relevant climate- and nature-related risks and opportunities where such information is material, more specifically:

- Disclose the metrics used by the sovereign to assess climate- and nature-related risks and opportunities in line with its country strategies (NDCs, NAMAs, NAPs, NBSAPs) and risk management process
- Disclose sectoral and, if appropriate, trade-related GHG emissions and the related risks
- Describe the targets used by the sovereign to manage climate- and nature-related risks and opportunities and performance against targets, and the ways in which such targets are aligned with its NDC
- Disclose limits or thresholds for climate and nature-related criteria aligned with ecological boundaries than \$NZ 250 million; and

Source: Climate Finance Advisors 2021; TCFD 2017.

Note: NAMA = nationally appropriate mitigation action; NAP = national action plan; NBSAP = national biodiversity strategy and action plan; NDC = nationally determined contribution.

## What Are the Information Needs and Who Are the Parties Responsible for Providing the Information?

The information needed for sovereign climate and nature reporting could largely be drawn from existing sources. The information needed to deliver an informative sovereign climate and nature report is largely already available. Such information is already produced by the sovereign entity through various ministries (finance and planning ministries) or is available through derivative sources of information such as the World Bank Sovereign ESG Data Portal (World Bank 2019) or IMF consultations that include climate considerations.<sup>4</sup>

It is anticipated that responsibility for preparing the report will be assigned to the Ministry of Finance, with involvement from the Debt Management Office (DMO). The DMO is in effect the state's banker and usually conducts interactions with investors. This assignment would allow for reporting and scenario analysis to draw on information generated by other fiscal processes that may be integrating climate-related criteria in parallel, such as IMF Financial Sector Assessment Programs (FSAPs) and Article IV reviews. Additionally, programs like the World Bank's Country Climate and Development Reviews (CCDRs) could also serve as critical input. Considering climate- and nature-related data with the same rigor and attention as economic data could result in relevant risks and opportunities being mainstreamed in economic calculations and decision making. Links could also be made with broader budget tagging and public reporting initiatives.

Coordination would likely be challenging as the entity within government leading the reporting would need to have both a very good understanding of climate and nature and of economics and finance, with these two areas of expertise usually residing in different teams. New information might also be required that would require specific coordination with the appropriate content providers, and in certain cases appropriate technical assistance or funding. Any framework developed should consider the

practicalities of reporting including the proposed scope, what specific information would be sought, who could lead this work, and who should be involved.

**Information needed could include (both physical and transition risks):**

- Baseline information about climate-related risks and the resulting vulnerability to a country or sovereign, including information related to concentration of risks among certain economic sectors, geographies, or communities, and how these risk scenarios evolve over different warming scenarios and the financial and economic implications under different policy scenarios. For all baseline information, back-casting may be important to track the rate of change or acceleration of risks against the baseline;
- Information about sovereign strategies (governance, risk management, and metrics) to address climate-related financial risks, including NDCs, NAPS, NAMAs, NBSAPs, and other sector-specific strategies that identify approaches and investments that manage and mitigate climate-related risks (both physical and transitional);
- Information that supports an assessment of double materiality – both financial and sustainability. There is a broader scope of risks that are material for sovereigns as compared to corporates, and these may be difficult to quantify or prove financially material, but they may be equally important to track in terms of how a sovereign manages both vulnerability and exposure to climate change, particularly given the threat multiplier effect of climate change on other issues like poverty, migration, and security;
- A country's policies and management of its natural resources and nature-based resources that can reduce vulnerability; however, failing to invest in nature-based solutions can exacerbate vulnerability and exacerbate overall climate risk;

<sup>4</sup> IMF Article IV consultations aim to “promote the stability of member economies, as well as the effective operation of the international monetary system, including through maintaining global stability.” The integration of climate change into article IV consultations can serve as an important reference for the country, including as reference information for sovereign reporting. It should be noted, however, that these consultations do not take place every year, and not all article IV consultation reports are publicly available. The World Bank and IMF work together on three areas: debt sustainability analyses, FSAPs—another part of surveillance reports—and the Highly Indebted Poor Country program. A fourth collaboration was launched as a pilot in 2017: climate change policy assessments. The IMF has indicated that it intends to make these initiatives available to all countries as part of their efforts to integrate climate change into their consultations with members, a move that has received external support.

<sup>5</sup> World Bank processes such as the CCDRs may not be the only processes that could be leveraged. Others include initiatives run by the UN, OECD, and other international organizations.

- The impact of addressing climate-related risks (physical and transitional) in increasing sustainability overall, and consequently, a government's ability to generate revenues to repay its debt, which may become a key driver of sovereign credit ratings and sovereign bond returns. Just as degradation of natural assets can give rise to risks for sovereign debt holders, careful stewardship of natural capital has the potential to yield beneficial outcomes; and
- The metrics and targets that the sovereign intends to use to measure its progress going forward.

**In this context, there are several existing policies, sources of information, and processes, such as the NDC process or the IMF Article IV process, that can be leveraged to gather or give guidance on the**

**information needed for a disclosure by a sovereign entity.** Table 2 outlines several key documents and existing sources of information that can be useful input for a sovereign report, along with the ministry or agency within a government typically responsible for producing such information. It is likely that information from across different ministries and agencies will be necessary for any comprehensive sovereign disclosure. Note that many of the suggested sources of information are still evolving, while many governments are still learning how to prepare them and discerning the limitations they have while collecting relevant information. Similarly, the process of preparing a credible report would need to be refined over a few iterations, helping to identify the best sources of available information over time. These sources of available information might also differ between governments.

**TABLE 2 - Key Documents and Existing Sources of Information That Can Serve as Input to a Sovereign Report**

<b>Sovereign's existing plans, publications, and other sources of information useful for a TCFD-aligned disclosure</b>	<b>Ministry or agency commonly responsible for producing these reports*</b>
Country climate strategies and international commitments <ul style="list-style-type: none"> <li>■ NDCs</li> <li>■ NAPs</li> <li>■ NAMAs</li> </ul>	Environment, finance, foreign ministries
Nature-based strategy and international commitments <ul style="list-style-type: none"> <li>■ NBSAPs</li> <li>■ Natural capital accounting, wealth accounting</li> </ul>	Environment ministries
Financial and economic assessments <ul style="list-style-type: none"> <li>■ Fiscal headroom, macroeconomic health (GDP, income per capita)</li> <li>■ FSAPs</li> <li>■ Sector concentration related to economic growth, productivity</li> </ul>	Finance ministries, DMOs Perhaps some sector-oriented ministries relevant for exposure to transitional and physical risks (energy, agriculture, etc.)
Information important for sovereign bond issuances <ul style="list-style-type: none"> <li>■ GDP growth, economic development trends</li> <li>■ Per capita income</li> <li>■ Inflation</li> <li>■ External debt, history of default</li> <li>■ Political volatility</li> </ul>	Finance ministries, DMOs
Climate vulnerability and exposure <ul style="list-style-type: none"> <li>■ Climate-related hazards expected to impact country (acute, chronic)</li> <li>■ Vulnerability assessments</li> <li>■ Disaster-related assessments (loss and damage)</li> </ul>	Environment, disaster/aid, finance ministries Perhaps some sector-oriented ministries (energy, agriculture, etc.)

Source: World Bank.

Note: DMO = Debt Management Office; FSAP = Financial Sector Assessment Program; NAMA = nationally appropriate mitigation action; NAP = national action plan; NBSAP = national biodiversity strategy and action plan; NDC = nationally determined contribution; TCFD = Task Force on Climate-Related Financial Disclosure.

\* Other ministries and agencies may potentially have primary responsibility for these reports.

Among the more important elements of a disclosure will be the need for information to be provided on a regular and ongoing basis. Current processes such as the NDCs or (for emerging markets) country strategies may be produced only every three or five years (or longer). Significantly, disclosures of any form typically present information in a snapshot in time, and such information is typically backward-looking. Existing corporate-focused frameworks not only recognize that climate-related risks need to be understood as they are in any given moment but also recognize that forward-looking analysis will be important.

A key challenge for any sovereign will be the use of scenario analysis to identify, assess, analyze,

and disclose their plan in the short, medium, and long term. Sovereigns would be well served to note the challenges that corporates and investors have faced in handling scenario analysis for reporting and the benefits of adopting a standard set of scenarios and analytic methodologies that can serve as “best practice” for climate-related disclosures by sovereigns.

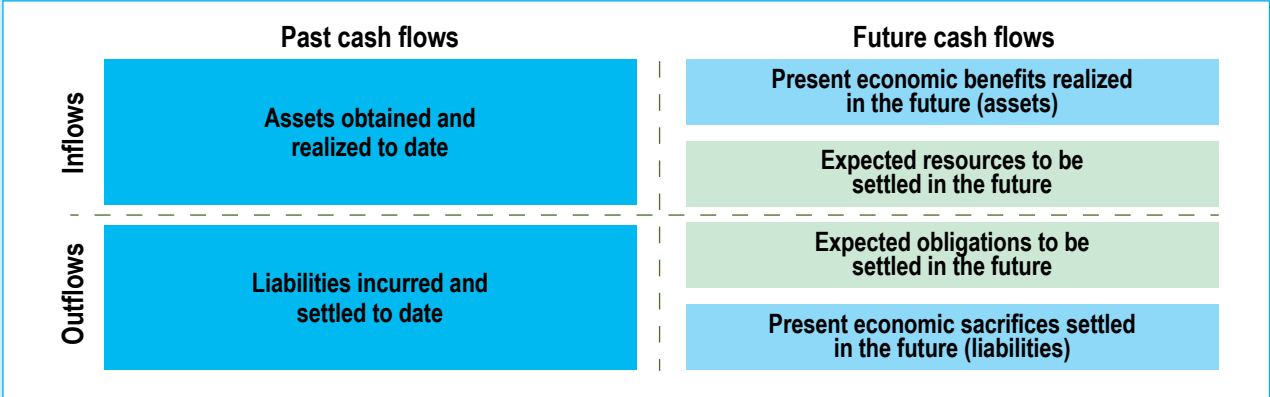
An important benefit of any framework is that as a disclosure mechanism, it not only provides information for specific types of uses but also informs the risk management of other stakeholders. Given that the function of risk management ideally is an ongoing process, it is important that any approach to disclosures both apply

**BOX 4 - International Public Sector Accounting Standards Board (IPSASB)**

IPSASB, an independent board of 18 public sector finance experts, develops and maintains the only global financial reporting standards for the public sector. A range of existing IPSASB guidelines can support sustainability reporting by considering long-term projections on public sector finances and service performance information. IPSASB’s three RPGs are all relevant in the context of climate risk analysis:

- Reporting on the long-term sustainability of an entity’s finances (RPG1) provides guidance on broader disclosures about long-term fiscal sustainability and includes guidance on the projection of inflows and outflows based on assumptions regarding policy decisions, future economic conditions, and other conditions.

**FIGURE B4.1- Costa Rica Data Snapshot (WBCSD 2018)**



- Financial statement discussion and analysis (RPG2) recommends the provision of information on the external trends, risks, and uncertainties that are impacting or may impact a public sector entity’s financial position, financial performance, and cash flows.
- Reporting service performance information (RPG3) provides good-practice recommendations on reporting information on the services that a public entity provides, its service performance objectives, and the extent of its achievement of those objectives. Climate change is relevant to the extent that it is affecting or may affect the services performed by the sovereign entity and the extent to which it is achieving its service performance objectives.

In addition to this guidance, IPSASB is now developing guidance on financial reporting on natural resources, which include subsoil resources, water, and living resources (plants and animals). The board plans to issue a consultation paper on this topic at the end of the first quarter of 2022.

Source: IPSASB 2020.  
 Note: RPG = recommended practice guideline.

scenario analysis and be made available on a frequent and regular basis for users to be able to track changes in risk, see early patterns of accelerating risks, and be able to use such insights to enable better forward planning.

## Are There Other Potential Approaches to Developing a Sovereign Reporting Framework?

**The IPSASB, an independent, nonprofit organization that works to improve public sector financial reporting by developing international financial reporting guidance for the sector, has pointed to the benefit of accrual accounting by governments and other public sector entities around the world.** Consolidated government and public sector balance sheet information serves as a foundation for assessing long-term financial sustainability in combination with projected inflows and outflows based on assumptions regarding policy decisions, future economic conditions, and other conditions such as those related to climate change. Box 4 includes a summary of the work of IPSASB (IFAC 2020).

**Context-based performance accounting and reporting frameworks could offer a more holistic sustainability performance assessment.** To fully understand the creditworthiness or quality of an investment opportunity,<sup>6</sup> investors must be given a view of not just how entities cope with risks (climate change, ecosystem loss) from the outside world, but also of the risks (GHGs relative to threshold-based and science-based targets and goals) posed by its impact on the outside world. Context-based approaches intrinsically address materiality and inherently extend the reporting boundaries to include external as well as internal risks and opportunities. Particularly because sovereigns are such large actors (as compared to corporates), their potential impact on and exposure to the environment (both local and global facets) is potentially significant. Additionally, their economic stability is directly linked to social and environmental factors. A study by the University of Leeds (O'Neill et. al. 2018) shows how such sovereign context-based indicators might be developed. The study downscales four planetary boundaries (climate change, land-system change, freshwater use, and biogeochemical flows) to per capita equivalents and compares these to footprint indicators at the national scale. Regardless of methodology, a framework

developed for sovereign climate- and nature- risk and opportunity reporting should include both external and internal considerations, also known as double materiality (discussed further in box 5) and the inclusion of context-based criteria should be considered.

**There is a strong case for nature-related criteria to be disclosed by sovereigns and there are existing frameworks for natural capital accounting that could be used.** A country's natural assets are critical to its economic growth and stability, and therefore, should be accounted for and appropriately managed. In his landmark report, "Review of the Economics of Biodiversity," Partha Dasgupta characterized the biodiversity crisis as an "asset management problem" (Dasgupta 2021). The interaction between climate change and natural assets is increasingly relevant for sovereign bond investors, as the climate and biodiversity crises advance, create feedback loops, and reduce overall resilience. Natural capital accounting (NCA) is a tool that countries can use to better measure their natural assets and integrate them into national planning and development decisions. While natural capital accounts can take time to develop, there are emerging geospatial and machine learning tools that estimate the value of ecosystem services in a given area. Estimates of the value of a country's natural assets would be a critical component of sovereign climate and nature reporting, which can build on stocks and flows and provide information on investment and management approaches. It is possible that this reporting may drive governments to integrate their natural capital accounts into their national financial accounts as the United Kingdom has done (HMT 2011).

**The most commonly used NCA approach is the UN System for Environmental Economic Accounting (SEEA) framework, which is already being implemented in more than 89 countries (its implementation is planned in a further 27 countries) (UNCEEA 2020).** The SEEA framework integrates economic and environmental data to provide a more comprehensive and multipurpose view of the interrelationships between the economy and the environment and the stocks and flows of environmental assets. It contains standard concepts agreed upon internationally, definitions, classifications, accounting rules, and tables for producing internationally comparable statistics, accounts, and indicators with many different potential analytical applications. The United

<sup>6</sup> For a summary of the context-based approach to materiality, see McElroy (2019) and Thurm et al. (2018).



Nations Statistics Division adopted the SEEA Ecosystem Accounting at its 52nd session in March 2021. This adoption follows a comprehensive and inclusive process of detailed testing, consultation, and revision. Ecosystem accounts have already been used to inform policy development in more than 34 countries (UNCEEA 2020). The World Bank-led Global Program for Sustainability (GPS)<sup>7</sup>

provides support to countries to implement natural capital accounting and aims to promote sustainable development by ensuring that natural resources are mainstreamed in development planning and national economic accounts. GPS brings together a broad coalition of UN agencies, governments, international institutes, nongovernmental organizations, and academics to implement NCAs where there are internationally agreed standards and to develop approaches for other ecosystem service accounts.



Flooded streets in Houston, Texas, USA after Hurricane Harvey. Credit: Shutterstock

<sup>7</sup> The Global Program for Sustainability (GPS) promotes the use of high-quality data and analysis on natural capital, ecosystem services, and sustainability to better inform decisions made by governments, the private sector, and financial institutions. See <https://www.worldbank.org/en/programs/global-program-on-sustainability>.









## How Is Materiality Important in Driving a Reporting Framework for Sovereigns?

**An important concept for any reporting framework is materiality.** In existing corporate-focused recommendations, the TCFD noted that under its remit from the Financial Stability Board, “any disclosure recommendations by the task force would be voluntary, would need to incorporate the principle of materiality, and would need to weigh the balance of costs and benefits” (TCFD 2017). In the recommendations, the TCFD recognized “that most information included in financial filings is subject to a materiality assessment” and underscored the need to provide disclosure at least with respect to governance and risk management in annual financial filings.

[Because] climate-related risk is a nondiversifiable risk that affects nearly all industries, many investors believe it requires special attention. For example, in assessing organizations’ financial and operating results, many investors want insight into the governance and risk management context in which such results are achieved. The task force believes disclosures related to its governance and risk management recommendations directly address this need for context and should be included in annual financial filings.

For disclosures related to the strategy and metrics and targets recommendations, the task force believes organizations should provide such information in annual financial filings when the information is deemed material (TCFD 2017).

**In existing corporate-focused recommendations, the TCFD noted that organizations should consider climate-related materiality consistent with existing approaches to materiality in regulated financial filings (TCFD 2017).** In general, materiality as used by preparers, auditors, and users of financial information is widely understood as related to information that is “decision-useful for the reasonable investor.” Climate change and the health of a country’s ecosystems could be considered a potentially significant factor for a sovereign’s future financial and economic health and thus “material.” As the World Bank recently noted:

Risks thought to be financially immaterial in the past are quickly becoming material. Climate change analysis shows that financial markets are not efficient when there are significant externalities such as the impact of greenhouse gas emissions and biodiversity loss on societies and the global economy. Financial sector actors seeking to get ahead of the curve should consider what they expect to be material in the future, as actors in the public and private sectors work together globally and locally to create more efficient

markets for sustainable investment rather than merely what they can prove to have been financially material under inefficient markets. One category of risks that merits special attention is systemic risk, described by the Green Swan report (Bolton et al. 2020) as “potentially extremely financially disruptive events that could be behind the next systemic financial crisis” (World Bank 2020).

**Material information is widely considered to include any information whose omission would make a difference in the decision an investor takes regarding investment in an asset or security.** The “materiality” of various climate and nature-related criteria will need to be assessed in order to ensure that a sovereign climate and nature reporting framework best enables effective capital allocation and engagement by investors. Some investors may consider both financial and sustainability materiality in determining relevant factors for their investment decision making (double materiality), and they may

consider these factors along a spectrum that is shifting (dynamic materiality).<sup>8</sup>

**A double materiality and context-based reporting approach that uses a dynamic materiality lens could be considered for a sovereign climate and nature reporting framework (see box 5).** It is recommended that the consultation process thoroughly consider including information related to a sovereign’s impact on the climate and nature in the framework. Performance against global thresholds, such as the nine planetary boundaries (Stockholm Resilience Center n.d.), and allocations, such as emissions per capita, should be discussed as potential approaches for sovereigns to report information in a context-based way. The application of a dynamic materiality lens may allow the architects of the framework to identify criteria that are likely to become material (for both sovereigns and investors) in the short to medium term, even if they are not in the current economic environment.

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<sup>8</sup> With guidance from the IFRS Foundation, SASB is considering the concept of “dynamic materiality” adopted by five sustainability reporting standards organizations in their report, “[Statement of Intent to Work Together Towards Comprehensive Corporate Reporting](#),” which refers to the concept that what investors consider to be material ESG issues can change over time (Eccles 2020). For further information, see Kuh et al. 2020.



## BOX 5 - Double and Dynamic Materiality

### Double materiality: perspective from the European Commission

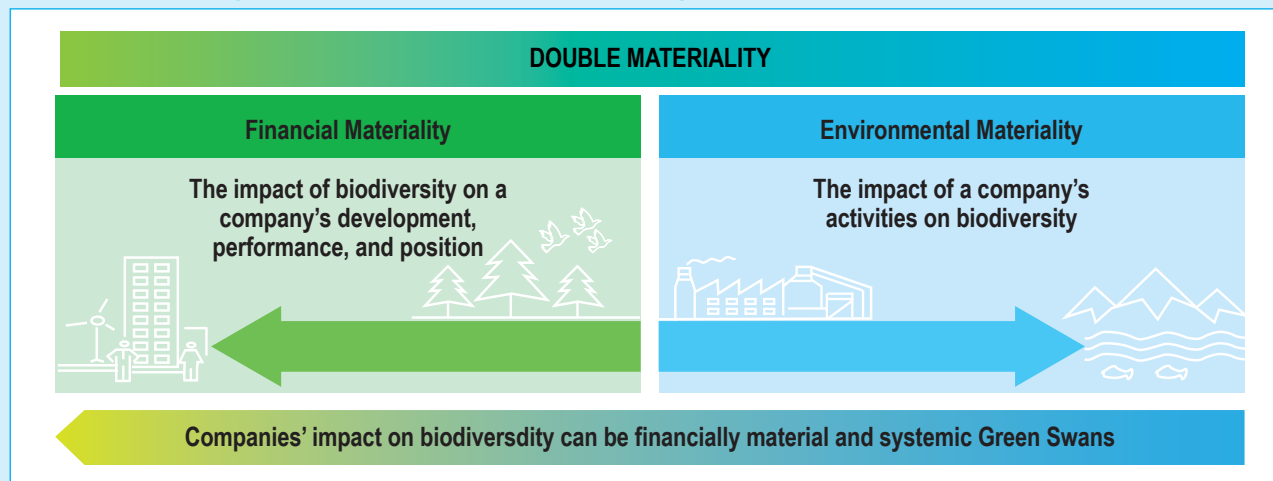
In its “Guidelines on Nonfinancial Reporting: Supplement on Reporting Climate-Related Information” issued in 2019, the European Commission noted the following: “According to the nonfinancial reporting directive, a company is required to disclose information on environmental, social, and employee matters, respect for human rights, and bribery and corruption to the extent that such information is necessary for an understanding of the company’s development, performance, position, and impact of its activities. Climate-related information can be considered to fall into the category of environmental matters.”

In the guidelines, the European Commission adopted a “double materiality” perspective:

- The reference to the company’s “development, performance, [and] position” indicates financial materiality in the broad sense of affecting the value of the company. Climate-related information should be reported if it is necessary for an understanding of the development, performance, and position of the company. This perspective is typically of most interest to investors.
- The reference to the “impact of [the company’s] activities” for an understanding of the external impacts of the company. This perspective is typically of most interest to citizens, consumers, employees, business partners, communities, and civil society organizations. An increasing number of investors also need to know about the climate impacts of investee companies, though, in order to better understand and measure the climate impacts of their investment portfolios.

Companies should consider using the proposed disclosures in these guidelines if they decide that climate is a material issue from either of these two perspectives.

**FIGURE B5.1- Representation of Double Materiality**



Source: World Bank 2020, adapted from EU 2019.

### Dynamic materiality: perspective from the World Economic Forum

The concept of dynamic materiality, popularized by the World Economic Forum (WEF) in 2020, emphasizes that there is a path for issues to become financially material over time, due to triggers. WEF looks at materiality as a process that unfolds, often very rapidly. According to this perspective, what appears financially immaterial today can quickly prove to be critical to corporates (or sovereigns) in the near future. The COVID-19 pandemic and the resulting economic crisis have illustrated how quickly and dramatically the economy can change. Indeed, double materiality and dynamic materiality are interrelated concepts representing different aspects of the same process. Dynamic materiality is the phenomenon that moves issues along the continuum from financially or economically nonmaterial to material.

Source: European Union 2019; World Economic Forum 2020.





Kelp fishing. Credit: Shutterstock





## What Is the Potential for Unintended Consequences?

**Ideally, a deeper and more common understanding of both physical and transition climate and nature-related risks should result in better policy outcomes and better pricing signals from financial markets,** not only from sovereign bond investors but also ratings agencies, insurance providers, and other financial institutions, including banks. Climate- and nature-related disclosures are key to such policy and pricing signals. At the same time, improved information on and attention paid to climate and nature-related risks could lead to capital flight, particularly from Emerging Market and Developing Economies (EMDEs).

**Improved information on and increased attention paid to climate risks in EMDEs could be harmful to highly vulnerable communities and countries if they result in the perception of increased sovereign risk by financial market actors.** EMDEs as well as certain cities and localities, many of which are already vulnerable due to poor quality of infrastructure, lack of economic development, and poor governance, are at particular risk. Capital flight could lead to significant headwinds for economic development, poverty alleviation, and growth, potentially even causing dislocation and migration in these places (CFA and GCA, 2019). Under these circumstances, the public balance sheets (of sovereigns, and to some extent of their donors and providers of development aid) would bear these risks ex-post if left unaddressed ex-ante. Emerging evidence indicates that climate-related risks have already started to influence the cost of capital, as evidenced by changes in sovereign bond spreads and credit ratings (Buhr et al. 2018, Volz et al. 2020).

**While there is a risk that sovereign climate and nature reporting could lead to an increased perception of risk in some countries, it is also possible that reporting could decrease the perception of risk if it is able to effectively integrate adaptation and resilience criteria into financial market analysis.** Currently, financial markets have much better access to information on climate risks than on actions countries have taken to mitigate and manage these risks through investment in adaptation and resilience (Buhr et al. 2018, Volz et al. 2020, World Bank 2019). Climate models are global, while adaptation and resilience actions are local. To the extent that information on adaptation and resilience actions by different countries is publicly available for investors and credit ratings agencies to review, it is not communicated in a regular, standardized, or comparable way (Aguilera et al. 2020).

**Climate and nature reporting can enable sovereigns to articulate their approach to managing relevant risks and give them greater ownership of the risk narrative presented to investors.** Currently, ESG data providers have a great deal of control over the climate risk information and narratives that investors use to assess sovereign risk (Gratcheva, Emery,



and Wang 2021). Reporting by sovereigns can help to address the adaptation and resilience information gap so that these actions are considered by financial markets alongside risk information. The World Bank's Resilience Rating System and System-Level Resilience Assessment could serve as frameworks to help governments identify relevant adaptation information to report (World Bank 2021b, Rozenberg et al 2021). Steps taken to conserve and restore nature should be communicated alongside climate adaptation and resilience actions, as such policies and investments can help to mitigate both climate- and nature-related risk.

Since the outcome of sovereign climate and nature reporting on risk perception is uncertain, it will be critical for governments, their donors, multilateral development banks, and partners to be prepared to manage the

downside of such risk being better integrated into financial markets. Simultaneously, these actors can develop national plans to invest in adaptation and resilience and communicate these plans to investors through reporting. Investors are increasingly looking for opportunities for their investments to contribute to positive impact, aligned with achieving the sustainable development goals. Table 3 summarizes potential risks of sovereign climate and nature reporting. A tiered reporting approach could be developed, by which countries could start reporting immediately with the information they have and work their way up to more in-depth and comprehensive reporting over time. As physical risk, adaptation, and resilience data is relevant for all countries, sovereign data on various criteria should be assessed within the context of a country's income level.

**TABLE 3 - Summary of Potential Risks of Sovereign Climate and Nature Reporting**

Entity	Potential Benefits
Sovereigns	<ul style="list-style-type: none"> <li>■ Greater capital outflows when climate- or nature-related risks are officially identified</li> <li>■ Harmonized TCFD scenarios may differ from government's own views of the future trajectories of emissions</li> <li>■ Despite appealing plans for investment, there may be limited human or technical capacity and access to capital may leave countries under-invested in key areas</li> </ul>
Investors	<ul style="list-style-type: none"> <li>■ Stranded assets in areas that are understood to face higher climate and nature risks (floodplains, uninsured assets)</li> <li>■ Increased visibility of opportunities may attract more investor interest and capital, pushing up prices for these investment targets and lowering financial returns</li> </ul>
Other actors	<ul style="list-style-type: none"> <li>■ Greater visibility of climate and nature-risks could make it more difficult for subnational entities such as cities to raise capital or put pressure on companies to disclose and explain how they are managing those risks to their investors</li> <li>■ Incumbent actors who see the current system as working—it just needs more political will—may see problems with adding more paperwork rather than more investment capital</li> </ul>



## What Are the Recommended Next Steps to Developing and Implementing a Reporting Framework for Sovereigns?

**Efforts to develop a sovereign climate and nature reporting framework should be closely aligned with ongoing work to develop global, harmonized international sustainability standards for corporates.** The key stakeholders involved in the process of developing baseline, global sustainability reporting standards (including the IFRS Foundation and IOSCO) have recognized that, while starting with the private sector is necessary to progress with the speed and urgency needed, standards will also eventually be needed for a broader set of issuers, including public sector entities. Institutions that have public sector expertise such as the World Bank and IPSASB are already engaged as observers in the process around the proposed establishment of the International Sustainability Standards Board (ISSB), under the IFRS Foundation structure and plan to continue to provide input on the public sector perspective as the standards themselves are developed. This will allow the standards to be informed with as broad a user base as possible in mind from the start, despite the capital markets focus proposed for the ISSB.

**Once the ISSB standards are more developed, IPSASB together with other partners could draw on its public sector standard-setting experience to determine, through a consultative process, how such standards could be adapted for public sector issuers.** There are a number of important stakeholders who are well positioned to feed into the consultation process led by IPSASB, including governmental networks such as the Coalition of Finance Ministers for Climate Action and the G20 Sustainable Finance Working Group; international standard setting organizations like the TCFD, TNFD (Task Force on Nature-Related Financial Disclosures), IFRS, and IOSCO; international organizations including the IMF and World Bank, the UN, those UN agencies supporting the UNFCCC and Paris Agreement, and the OECD; and national standard setters who are starting to develop or apply international guidance for their own jurisdictions.

**A multistakeholder group could be convened to contribute to the framework development process to ensure its credibility, robustness, and effectiveness at meeting desired objectives.** These stakeholders can also help to ensure that the framework can be effectively implemented and that the information and metrics are already available or can be developed. Lessons learned from corporates and other entities that report according to the existing frameworks will be relevant. The benefits of a more standardized approach to enable comparability and the challenges associated with limitations in current information sources will

need to be balanced. The group could also coordinate with the G20 Sustainable Finance Working Group, which highlights reporting in its sustainable finance road map.<sup>9</sup> As the users of this framework, investors should also be engaged. Ceres and UN Principles for Responsible Investment have already formed a group of investors committed to working on this topic—the Assessing Sovereign Climate-related Opportunities and Risks (ASCOR) project—that could be consulted.

**Pilots could be identified to test a draft sovereign reporting framework and to determine the potential structure of complementary technical assistance for countries.** Trialing the framework in jurisdictions with different contexts, including through joint World Bank pilots with other multilateral development banks such as the Inter-American Development Bank, the Asian Development Bank, the African Development Bank, and the European Bank for Reconstruction and Development could help refine the structure and approach and ensure its practicality and usefulness.

**Over the longer term, assistance will be needed.** This help would be in areas such as building capacity in the Ministry of Finance or DMO functions of the sovereign to enable ongoing climate-risk management and disclosure; undertaking benchmarking, baselines, or other assessments (which may not be in place) to understand the existing climate- and nature-related financial risks facing a sovereign; help in translating climate- and nature-related risk assessments (both physical and transitional) into country investment strategies, particularly for the low-carbon, nature-positive transition; ensuring that the role of nature-based solutions are included in sovereign investment pipelines and overall resilience efforts; and, by using such assessments to inform budget planning, strategies to raise capital and the more effective use of development and disaster aid, particularly by developing countries. Existing programs within development finance institutions may be well suited to provide the necessary technical assistance. Examples include the IMF's Article IV Assessments and the World Bank's Country Climate and Development Reports (CCDRs).

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9 See G20 Sustainable Finance Roadmap and <https://www.g20.org/wp-content/uploads/2021/10/G20-Sustainable-Finance-Roadmap.pdf>.





# Annex A Draft Sovereign Climate and Nature Risk and Opportunities Reporting Framework

Developed by the Finance, Competitiveness, and Innovation Global Practice of the World Bank

A draft example of a Sovereign Climate and Nature Risk and Opportunities Reporting Framework developed by the Finance, Competitiveness, and Innovation Global Practice of the World Bank is presented here. Note that the example is included as a starting point for discussion only and is not intended as a template for a standard. Any framework developed should follow an extensive, coordinated, and inclusive consultation process including pilots in client countries that should in no way be constrained or predetermined by the example presented here (Table A.1).

TABLE A.1 - Draft Sovereign Climate and Nature Risk and Opportunities Reporting Framework

Category	Criteria
<b>Introduction</b>	<ul style="list-style-type: none"><li>■ Describe the actual and potential impacts of climate- and nature-related risks including physical risks.</li><li>■ Describe the risks and opportunities for the sovereign's economy (its potential effects, for example, on the main sources of revenue and debt and on the real sector and financial sector) and society.</li><li>■ Provide physical and economic data on the country's natural assets, including information on the bioregions of the country. Provide relevant metrics (to the extent that they are available) on the health of bioregions (these metrics can be related to ecosystem functionality or biodiversity).</li></ul>
<b>Governance</b> The sovereign's governance systems around climate and nature related risks and opportunities	<ul style="list-style-type: none"><li>■ Describe whether the sovereign has committed to or ratified international climate change and other environmental agreements, including the UNFCCC Paris Agreement, the Convention on Biodiversity, the UN Convention to Combat Desertification, the Convention on International Trade in Endangered Species, or other relevant conventions.</li><li>■ Describe the sovereign's policies, regulations, and laws related to climate and nature-related risks and opportunities, including those concerning clean energy targets, carbon pricing, energy sector reforms, agriculture and land use reforms, biodiversity conservation, payments for ecosystem services programs, restoration, and other relevant climate or environmental areas. Provide dates on when various legislation was passed and when programs were implemented.</li></ul>

	<ul style="list-style-type: none"> <li>■ Describe the specific ministries and departments and units dedicated to coordinating the sovereign's climate change response and relevant activities, including carbon emissions inventories, national disaster management responses, national resilience action plans, clean technology and clean energy initiatives, nature-based solutions, and climate budget and funding planning.</li> <li>■ Describe the specific ministries and departments and units dedicated to coordinating the sovereign's management of its biodiversity and ecosystem services, including natural capital accounting, environmental regulation, biodiversity offsets, sustainable agriculture initiatives, conservation and restoration initiatives, sustainable use initiatives, payments for ecosystem services markets, public land and waters management, and natural resource extraction.</li> <li>■ Describe the role of key stakeholders in the national climate and nature governance structure, including state-owned enterprises (SOEs), regional governments and local authorities, trade unions, NGOs, corporations, indigenous people's groups, and others.</li> </ul>
<b>Strategy</b> The sovereign's risks and opportunities identified at different time horizons, the expected impacts, and the government's resilience assessment under different scenarios	<ul style="list-style-type: none"> <li>■ Describe the short-, medium-, and long-term exposures of sovereign public and private assets resulting from the physical and transition risks of climate change.</li> <li>■ Describe the sovereign's short-, medium-, and long-term strategy for managing biodiversity and natural assets and the exposure from the physical and transition risks of biodiversity and ecosystem services loss.</li> <li>■ Describe the economic and fiscal impacts associated with the following scenarios: <ul style="list-style-type: none"> <li>– NGFS Net Zero 2050 (1.5°C in 2050)</li> <li>– NGFS Delayed Transition (2°C in 2050)</li> <li>– NGFS Current Policies (3°C in 2080)</li> <li>– IPCC SSP3 (2.8–4.6°C in 2080–2100, best estimate 3.6°C)</li> </ul> </li> <li>■ Describe the impact of climate change and biodiversity loss on economic, social, geopolitical, and financial systems such as expected patterns of migration, potential impact on public health and healthcare systems, availability of resources for private sector and citizens, food security risk, technology investment gaps, risk to reputation, and ability to raise capital; the need for disaster-related financial protection instruments such as insurance and contingent financing; rent from natural resources; the potential for natural or economic assets to become stranded; fiscal impacts; competitiveness; potential changes in international trade and tariffs; and social stability.</li> <li>■ Describe the government's strategy and agenda to manage climate- and nature-related physical and transition risks.</li> </ul>
<b>Risk Management</b> The processes used by the sovereign to identify, assess, and manage climate-related risks	<ul style="list-style-type: none"> <li>■ Describe the governmental process for identifying and managing climate- and nature-related risks and the ways in which risk management is integrated into the sovereign's planning documents: NDCs, NAPs, NBSAPs, and other related policy or strategy documents relevant to climate- and nature-related risks and opportunities.</li> <li>■ Describe the role of SOEs, regional governments, local authorities, and any other relevant stakeholders in the identification and management of climate and nature-related risks.</li> </ul>

	<ul style="list-style-type: none"> <li>■ Describe the sovereign's approach to taking into consideration climate change-related risks (carbon pricing, energy and forestry sector reforms) and opportunities (clean energy and energy efficiency technologies) in financing publicly funded projects and institutions.</li> <li>■ Describe the sovereign's approach to taking into consideration nature-related risks (agricultural reforms, forestry sector reforms, biodiversity conservation) and opportunities (sustainable agriculture, forestry, and tourism) in financing publicly funded projects and institutions.</li> <li>■ Describe the sovereign's approach to taking into consideration climate- and nature-related risks in its fiscal strategy (budgetary deficit, borrowing strategy, creditworthiness management, compliance with international economic treaties).</li> </ul>
	<ul style="list-style-type: none"> <li>■ Describe how climate change and nature-related risk management is integrated into the government's strategy related to diplomacy, defense, economy, and finance.</li> <li>■ Describe the sovereign's participation in partnerships and advocacy for low carbon and resilient pathway for development such as the Coalition for Finance Ministers for Climate Action, the Network for Greening the Financial System, Carbon Pricing Leadership Coalition, the Partnership for Market Readiness, and the Partnership for Market Implementation.</li> </ul>
<b>Metrics and Targets</b> A disclosure of the metrics and targets used by the sovereign to assess and manage relevant climate-related risks and opportunities.	<ul style="list-style-type: none"> <li>■ Describe the sovereign's performance against public climate change and nature-related targets.</li> <li>■ Disclose the sovereign's <ul style="list-style-type: none"> <li>– Total CO2 emissions (in metric tons); CO2 emissions per capita; CO2 emissions per unit of GDP; CO2 emissions per sector; CO2 emissions growth rate; net CO2 emissions (for both produced emissions and consumed emissions); and total GHG emissions (metric tons of CO2 equivalent per capita);<sup>10</sup> CO2 emissions of imports; progress on CO2 and GHG emissions reductions as percent (emissions in current year versus emissions in base year);</li> <li>– Gross ecosystem product (if measured);<sup>11</sup> change in land use specified for each type of land (forest, wetland, coastal, other); percentage of forested land as percent of recommended coverage; hectares of terrestrial and marine protected areas as respective percentages of total territorial area; hectares of areas managed by indigenous peoples (and relative percentage of total territorial area); agriculture, forestry, and fishing, value added (percentage of GDP); and mammal species threatened (as a percentage of total mammal species); and percentage of population with access to green space; and</li> <li>– Annual freshwater withdrawals, total (billion cubic meters, percentage of internal resources, and per capita); renewable internal freshwater resources, total (billion cubic meters, percentage of internal resources); water stress (total water withdrawal and available renewable supply).</li> </ul> </li> </ul>

<sup>10</sup> This is inclusive of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).

<sup>11</sup> For an example of an approach that could be used, see <https://www.pnas.org/content/117/25/14593>.



- Disclose the actual and planned budget for climate and nature positive activities<sup>12</sup> (if any) as a percentage of total budget:
  - Disclose relevant taxes, subsidies, and direct expenditures on climate and nature positive activities (renewable energy, energy efficiency, climate-smart and sustainable agriculture, green finance, water efficiency, land and forest restoration and conservation, disaster and emergency preparedness, academic research, public funding of research and development); and
  - Disclose climate and biodiversity funding programs (disclose if earmarked green and climate bonds and loans, sustainability-linked bonds and loans are funds linked to key performance indicators).
- Disclose the actual and planned budget for climate- and nature-negative activities<sup>13</sup> (if any) and as a percentage of total budget (relevant taxes, subsidies, and direct expenditures, including in the energy, agriculture, forestry, fisheries, and waste sectors).
- Provide information on the budgets for units in Ministries, departments, and agencies dedicated to coordinating the sovereign's climate change and biodiversity responses and activities.

Note: "Nature" refers to the natural world, with an emphasis on biodiversity and ecosystem services. Nature contributes to societies through the provision of contributions to people. Nature-related risks stem from the dependencies and impacts of countries and communities on nature and its biodiversity through their dependencies (reliance on ecosystem services and natural capital) and through their impacts (positive or negative effects of activity) on nature. GHG = greenhouse gas; IPCC = Intergovernmental Panel on Climate Change; NAP = national action plan; NBSAP = national biodiversity strategy and action plan; NDC = nationally determined contribution; NGFS = Network for Greening the Financial System; NGO = nongovernmental organization; UNFCCC = United Nations Framework Convention on Climate Change. United Nations Framework Convention on Climate Change.

<sup>12</sup> This refers to activities contributing to climate change mitigation and adaptation, biodiversity conservation, restoration, and sustainable use.

<sup>13</sup> This means activities contributing to climate change and destruction of nature.



## Annex B: Supplemental Information on Existing Corporate-Focused Reporting

### Background on Task Force on Climate-Related Financial Disclosures

The Financial Stability Board created the Task Force on Climate-Related Financial Disclosures to improve and increase reporting of climate-related financial information at the request of G20 finance ministers and central bank governors in April 2015. The TCFD was tasked with developing a framework and guidance for “voluntary, consistent climate-related financial disclosures” that would be useful to investors, lenders, and insurance underwriters in understanding material risks that are derived from a warming planet.

After extensive public consultations in June 2017, the TCFD finalized their recommendations for climate-related financial disclosures, which were structured around four thematic areas as illustrated in figure 2: governance, strategy, risk-management, and metrics and targets.

TCFD’s initial target audience were corporates, listed equities, banks, and insurers in the private sector. Over the past few years, the TCFD’s recommendations have become widely recognized as the reference framework for reporting on climate-related financial risks and opportunities, with nearly 60 percent of the world’s 100 largest public companies expressing support for the TCFD framework, actively reporting in line with the TCFD recommendations, or both (TCFD 2020). As of October 6, 2021, TCFD had over 2,600 supporters globally (including 1,069 financial institutions) responsible for financial company assets of US\$194 trillion. TCFD supporters now span 89 countries and jurisdictions and nearly all sectors of the economy, with a company combined market capitalization of over US\$25 trillion, a 99 percent increase since 2020.<sup>14</sup> Such widespread support from a cross-section of stakeholders reinforces both the need for climate-related financial information across a range of users from policy makers and regulators to a variety of investor types and the value of the TCFD framework in enabling transparent, clear, and consistent information about how climate change may impact financial returns and have potentially systemic consequences of economic relevance across communities and markets.

A key challenge for any sovereign will be the use of scenario analysis to identify, assess, analyze, and disclose their plan in the short, medium and long term. Here, the proponents of a TCFD-based framework for sovereigns would be well served to note the challenges that corporates and investors have faced in handling scenario analysis for TCFD reporting and the benefits of adopting a standard set of scenarios and analytic methodologies that can serve as “best

practice” for sovereigns’ climate-related disclosure. Box B.1 outlines emerging approaches recommended by the NGFS for undertaking scenario analysis that are relevant for sovereign-level disclosure objectives (TCFD 2021).

An important benefit of the TCFD framework is that as a disclosure mechanism, it not only provides information for specific types of uses, but also informs the risk management of other stakeholders. Box B.2

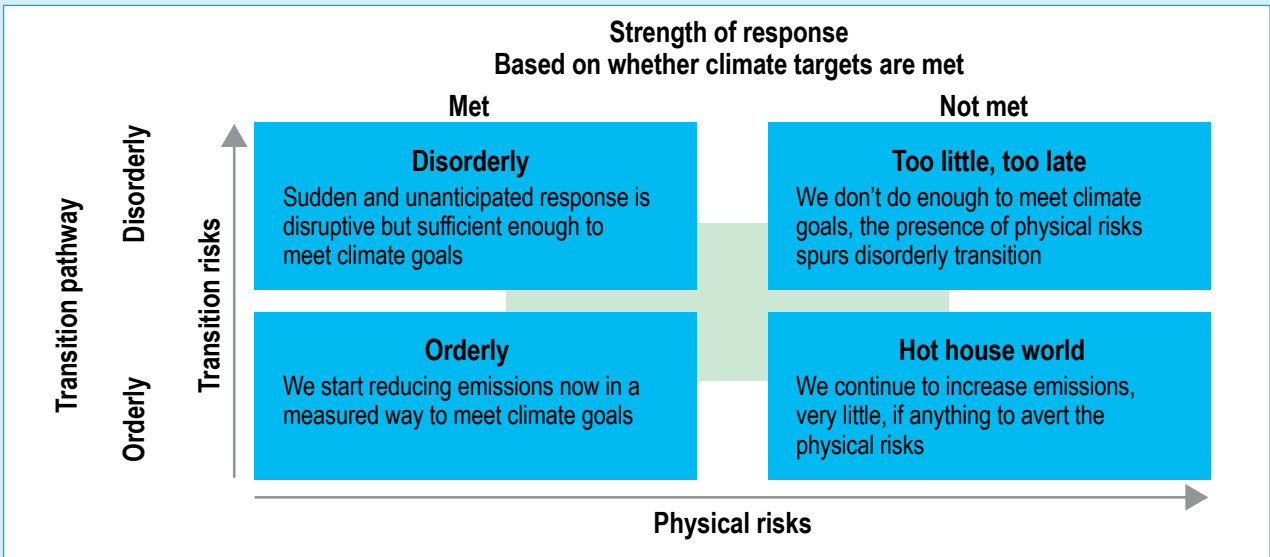
### BOX B.1 - Potential Options for Scenario Analysis for Sovereigns

#### Network for Greening the Financial System

The Network for Greening the Financial System (NGFS) is a group of 105 members and 16 observers. The NGFS climate scenarios, which were developed with the assistance of a coalition of private, public, and academic institutions, explore the impacts of climate change and climate policy with the aim of providing a common reference framework. Four broad scenarios are considered based on whether climate targets are met and whether the transition pathway is orderly or disorderly:

- **Orderly** assumes that climate policies are introduced early and become gradually more stringent. Net-zero CO2 emissions are achieved before 2070, giving a 67 percent chance of limiting global warming to below 2°C. Physical and transition risks are both relatively low.
- **Disorderly** assumes climate policies are not introduced until 2030. Since actions are taken relatively late and limited by available technologies, emissions reductions need to be sharper than in the orderly scenario to limit warming to the same target. The result is higher transition risk.
- **Hot-house** world assumes that only currently implemented policies are preserved. NDCs are not met. Emissions grow until 2080, leading to 3°C or more of warming and severe physical risks. This includes irreversible changes like higher sea-level rise.
- **Five alternate scenarios** have been produced to explore different assumptions, such as different temperature targets, policy responses, and technology pathways.

FIGURE B.1 - NGFS Climate Scenarios Framework



Source: NGFS 2020.



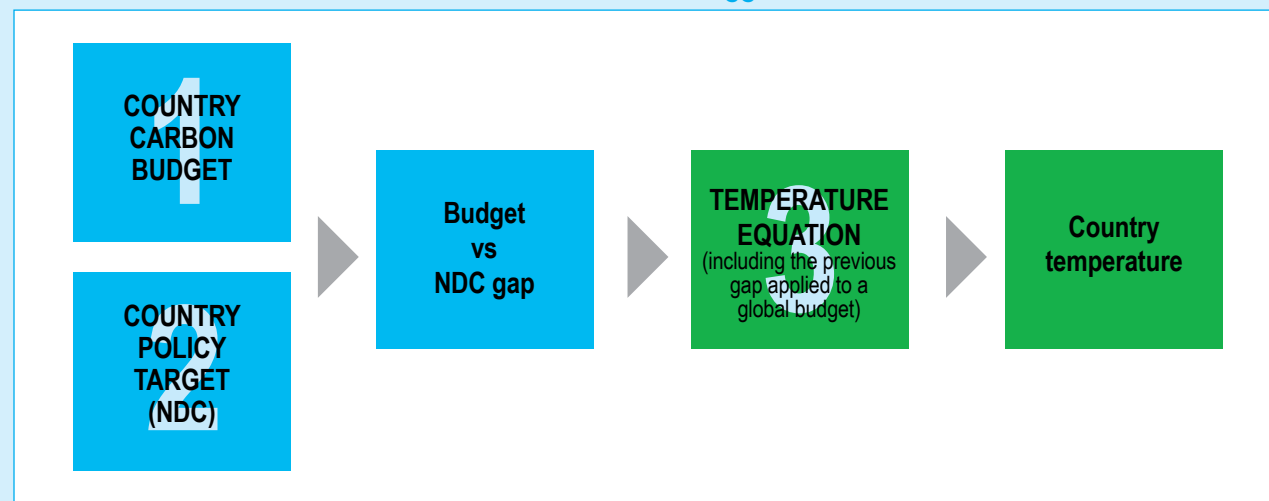
## BOX B.2 - Private-Sector Tools That May Be Applicable to Sovereigns

Private-sector actors have begun to explore scenario analysis for sovereigns and several tools exist that may be applicable and relevant for sovereigns to consider. Since 2010, multiple communities have collaborated on the so-called Shared Socioeconomic Pathway (SSP)-Representative Concentration Pathway (RCP) framework, a set of alternative socioeconomic development pathways (SSPs) and atmospheric concentration pathways (RCPs) with their associated climate change outcomes. However, it has been noted that the SSP-RCP framework has not improved the integration of societal and climate conditions.

Following are some initiatives that try to bridge this gap and help provide more comprehensive integration of both climate and societal conditions under different scenarios:

- **Science-based targets for financial institutions.** A financial institution's submission to the Science-Based Targets Initiative (SBTi) consists of scope 1 and 2 targets and scope 3 portfolio targets that meet SBTi criteria. At the time of target submission, financial institutions submit a brief summary of the strategy and actions it will implement to reach their portfolio SBTs and the reasons why they selected these actions. SBTi's phase 2 strategy is expected to cover asset classes as they relate to sovereigns.
- **Four Twenty-Seven and Carbone 4** include the results of their sovereign risk assessments in their company-level analyses.
  - **Four Twenty-Seven** includes its country climate risk indicators in the supply chain and market risk analyses of companies, which consider countries contributing to the supply chain and countries where products are sold.
  - **Carbone 4** covers a wide set of risks, many of which are not included in other methodologies. It examines the acute risk of groundwater floods and the chronic risks of urban heat islands, coastal erosion, and biodiversity migration and loss.
- **Principles for Responsible Investment (PRI)** has developed a practical guide to environmental, social, and governance (ESG) integration in sovereign debt. The guide is designed to help PRI signatories integrate ESG factors into the research and analysis of sovereign issuers and the construction of sovereign debt portfolios.
- **FTSE Russell and Beyond Ratings** offer a methodology to assess implied global warming temperatures of countries based on their national commitments concerning climate change mitigation and their NDCs. Building on the NGFS approach, their analysis explores two independent “worst-case” scenarios. Their framework enables a country-level assessment of the physical risk through the lens of a hot-house world scenario, and the transition risk via a disorderly transition scenario.

FIGURE B.2 - Overview of the FTSE Russell Methodology



Source: FTSE Russell 2021; SBTi 2021; UNEP-FI 2019.

outlines additional methodologies and approaches that may be employed in a sovereign context and that may be able to provide additional, assessments of sector or asset level risks that are more granular. Given that the function of risk management ideally is an ongoing process, it is important that any approach to disclosures apply scenario analysis and is provided on a frequent and regular basis for users to be able to track changes in risk, see early patterns of accelerating risks, and be able to use such insights to enable better forward planning.

## Background on Task Force on Nature-Related Financial Disclosures

**A parallel task force exploring a framework which can assess nature-related risks has been created.** An initiative to bring together a Taskforce on Nature-related Financial Disclosures (TNFD) was announced in July 2020, with the preparatory phase of the initiative running from September 2020 until June 2021. In June 2021, the TNFD formally launched to widespread support from financial institutions, corporates, governments, and civil society. The G7 finance ministers and G20 Sustainable Finance Roadmap have endorsed the TNFD. The G20 and G7 environment and climate Ministers have also recognized the establishment of the TNFD.<sup>15</sup>

**TNFD's framework for nature-related financial risk management and disclosure may be a necessary component for any country to produce a comprehensive climate and nature disclosure.** The TNFD aims for its framework to enable financial institutions and companies to incorporate nature-related risks and opportunities into

their strategic planning, risk management, and asset allocation decisions. The TNFD will build upon the structure and foundation of the TCFD. One way it is different from TCFD, however, is that it aims to take a double materiality approach, looking at the impact of nature loss on corporations and the impact of corporate activities on nature. The TNFD will build on the analysis of the Science-Based Targets Network, which is developing an approach that will enable corporations and cities to set science-based targets for “an equitable, nature-positive, net-zero future.”<sup>16</sup> The development of these targets follows the development of science-based targets for climate.<sup>17</sup> The TNFD is aiming to launch a beta framework in early 2022 with the goal of delivering a final framework by 2023. Such a framework could feed into the development of a sovereign climate and nature reporting framework.

The rationale for the TNFD includes the following:

- Nature loss poses material risks and opportunities for the finance sector, while action for nature-positive transitions could generate up to US\$10.1 trillion in annual business value and create 395 million jobs by 2030, according to the World Economic Forum.
- Financial institutions and corporates are demanding nature-related data and information.
- Standardizing nature-related disclosures can help shift finance from nature-negative to nature-positive investments.
- The TNFD complements the Task Force on Climate-related Financial Disclosures (TCFD).

<sup>15</sup> See <https://tnfd.global/>

<sup>16</sup> See <https://sciencebasedtargetsnetwork.org/how-it-works/what-are-sbts/>.

<sup>17</sup> See <https://sciencebasedtargets.org/>.



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