



**United Nations**

Department of  
Economic and  
Social Affairs



**UNDRR**

UN Office for Disaster Risk Reduction



# SMALL ISLAND DEVELOPING STATES (SIDS)

---

Gaps, Challenges and Constraints  
in Means of Implementing the Sendai  
Framework for Disaster Risk Reduction

**Copyright © 2022** United Nations Department of Economic and Social Affairs (UN DESA) and United Nations Office for Disaster Risk Reduction (UNDRR).

Cover photo: Maximilien Pardo

This assessment was possible through the generous contribution of the Republic of Korea.

This publication may be reproduced in whole or in part *and in any form for educational or non-profit services* without special permission from the copyright holder, provided acknowledgement of the source is made. The UN DESA would appreciate receiving a copy of any publication that uses this publication as a source.

## **Note**

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory or city or its authorities, or concerning the delimitation of its frontiers or boundaries. The material in this publication does not imply the expression of any opinion whatsoever on the part of UN DESA or UNDRR concerning the source materials used as a basis for the facts and figures in this report. Mention of a commercial company or product in this document does not imply endorsement by the UN DESA, UNDRR or the authors. The views expressed in this publication are those of the authors and do not necessarily reflect the views of the UN DESA or UNDRR. We regret any errors or omissions that may have been unwittingly made.

## **Recommended citation**

United Nations Department of Economic and Social Affairs and United Nations Office for Disaster Risk Reduction (2022). Gaps, Challenges and Constraints in Means of Implementing the Sendai Framework for Disaster Risk Reduction in Small Island Developing States.

# ACKNOWLEDGEMENTS

---

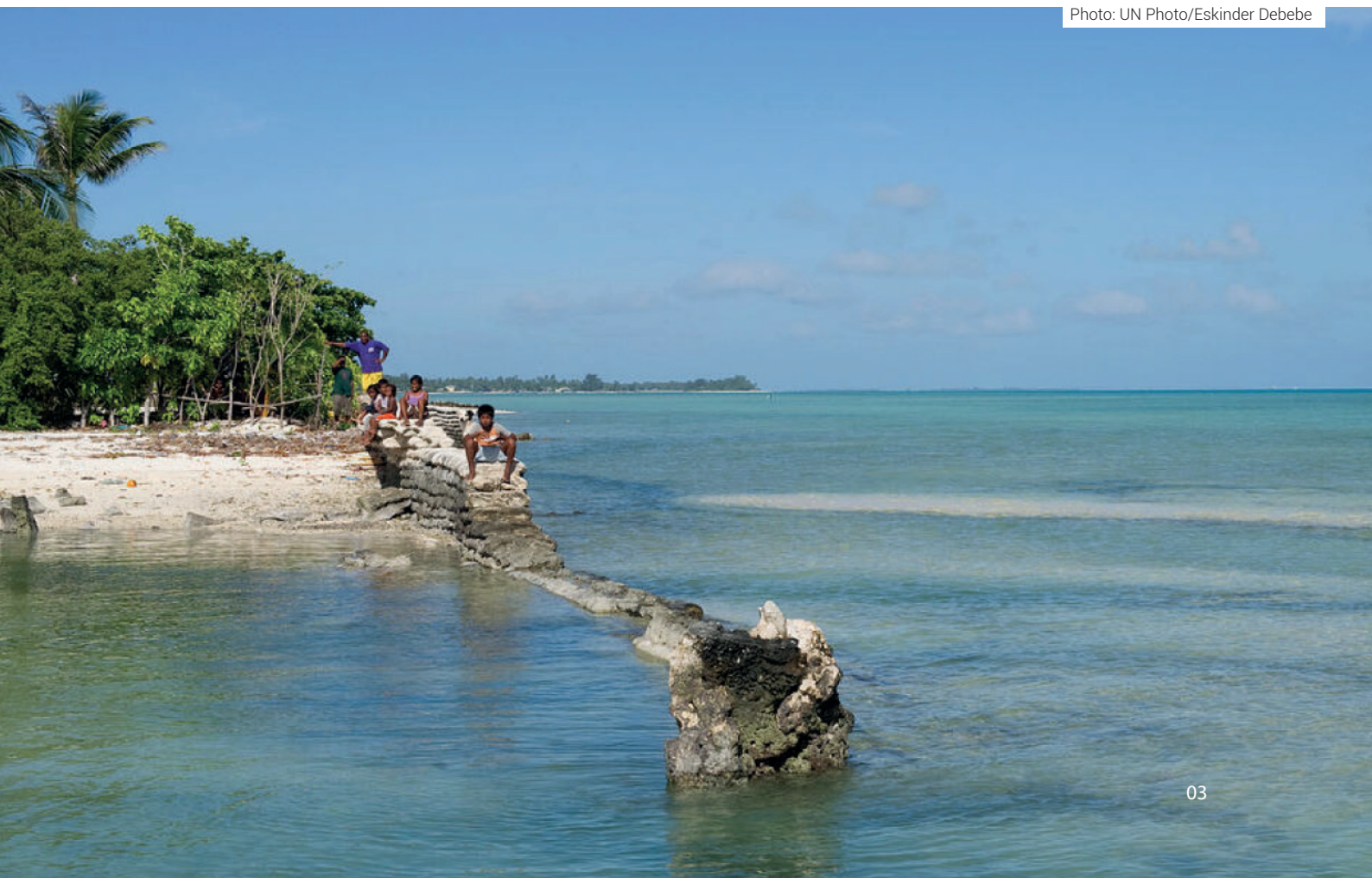
This report would have not been possible without the valuable contribution of the Sendai Framework focal points and disaster risk reduction authorities from small island developing states (SIDS) who actively participated in the regional workshops and bilateral consultations. They were instrumental in sharing insights, country-level experience, strategic vision as well as in providing written feedback and reviewing documentation. UNDRR colleagues, Gabrielle Emery, Roberto Schiano Lomoriello, Camilo Tellez Robayo, and Jair Torres, through commitment of time and expertise, facilitated dynamic regional workshops.

As this report consolidates existing literature, it is important to acknowledge that this assessment is also based on the extensive body of literature that addresses various challenges that SIDS face in improving their disaster risk reduction capacities. In this context, the literature produced by AOSIS, GFDRR, IISD, IPCC, OECD, UNCTAD, UN

DESA, UNDRR, UNDP, UNFCCC, and the World Bank, among others have been essential to the drafting of this report. National disaster risk reduction plans and post-disaster needs assessments were also critical in providing data.

AOSIS, UNDRR and UN DESA would like to particularly thank Mrs. Erum Hasan who carried out the analysis, the consultations and drafted the report while ensuring a truly participatory process amid all the actors and institutions involved. Also, AOSIS, UNDRR and UN DESA acknowledge the coordination, guidance, feedback provided by Toni-Shae Freckleton (UNDRR), Laurel Hanson (UNDRR), Ismail Zahir (AOSIS) and Maximilien Pardo (UN DESA) who worked as a team to bring this work to fruition. Last but not least, this assessment was funded by the Ministry of Environment of the Republic of Korea through the support of the UN Office for Sustainable Development (UNOSD) within UN DESA.

Photo: UN Photo/Eskinder Debebe



# TABLE OF CONTENTS

---

<b>FOREWORD</b>	<b>06</b>
<b>ACRONYMS</b>	<b>07</b>
<b>EXECUTIVE SUMMARY</b>	<b>10</b>
<b>PART I. CONTEXT</b>	<b>18</b>
1. INTRODUCTION	19
1.1 PURPOSE OF THE ASSESSMENT	20
1.2 STRUCTURE OF THE REPORT	21
1.3 METHODOLOGY	21
1.3 MEANS OF IMPLEMENTATION	21
1.4 CONCEPTS	23
<b>PART II. SIDS- A RATIONALE</b>	<b>25</b>
2.1 WHY SIDS?	26
2.1.1. UNIQUE VULNERABILITIES	26
2.1.2 PRONENESS TO, AND HIGH COSTS OF DISASTER	29
2.1.3 ECONOMIC CONSEQUENCES	33
2.1.4 IMPACTS OF COVID-19	36
2.1.5 LEADERS IN SUSTAINABLE DEVELOPMENT	36
<b>PART III. MEANS OF IMPLEMENTATION</b>	<b>38</b>
3. FINANCIAL RESOURCES	39
3.1 CHALLENGES IN ACCESSING CONCESSIONAL FINANCING	40
Summary Box- Challenges in Accessing Concessional Financing	40
3.1.1 EX-POST VERSUS EX-ANTE FINANCING	43
Summary Box-Ex-Post versus Ex-Ante Financing	43
3.1.2 CLIMATE CHANGE ADAPTATION FINANCING VERSUS DISASTER RISK REDUCTION FINANCING	45
Summary Box- Climate Change Adaptation Financing Versus Disaster Risk Reduction Financing	45
3.2 DOMESTIC RESOURCES & PRIVATE SECTOR	48
Summary Box- Domestic Resources and Private Sector in SIDS	48
3.3 INNOVATIVE FINANCING	53
Summary Box-Innovative Financing	53
<b>4. CAPACITY GAPS</b>	<b>56</b>
4.1 HUMAN RESOURCES	56
Summary Box- Human Resources	56
4.2 CAPACITY GAPS – SKILLS AND TRAINING	58
Summary Box- Capacity Gaps: Skills and Training	58

4.3 DATA AND TECHNOLOGY CAPACITY GAPS .....	60
4.3.1 CONSTRAINTS IN DATA GENERATION AND ANALYSIS .....	61
Summary Box- Constraints in Data Generation and Analysis .....	61
4.4 DATA AND INFORMATION NEEDS .....	64
Summary Box- Data and Information Needs .....	64
4.5 TECHNOLOGY AND INNOVATION .....	66
Summary Box- Technology and Innovation .....	66
4.6 INFRASTRUCTURE AND COMMUNICATIONS .....	70
Summary Box- Infrastructure and Communications .....	70
5. INSTITUTIONAL SUPPORT .....	72
5.1 INSTITUTIONAL CONSTRAINTS PREVENTING SUCCESSFUL IMPLEMENTATION OF DRR ....	72
Summary Box-Additional Institutional Constraints Preventing Successful Implementation of DRR .....	72
5.2 INDIGENOUS KNOWLEDGE AS CENTRAL TO DRR .....	75
Summary Box- Indigenous Knowledge as Central to DRR .....	75
5.3 MONITORING AND REPORTING GAPS .....	77
Summary Box- Monitoring and Reporting Gaps .....	77
6. PARTNERSHIPS .....	79
Summary Box- Partnerships .....	79
<b>PART IV. CONCLUSIONS AND KEY MESSAGES .....</b>	<b>83</b>
7. ADDITIONAL BEST PRACTICES .....	84
8. CONCLUSIONS AND RECOMMENDATIONS .....	87
8.1 CONCLUSIONS .....	87
8.2 KEY MESSAGES .....	91
<b>ANNEX 1. WORKS CITED .....</b>	<b>93</b>
<b>ANNEX 2. PARTICIPANTS AT REGIONAL WORKSHOPS .....</b>	<b>101</b>

# FOREWORD

---

Small Island Developing States currently suffer the highest frequency of disasters in the world, ranging from severe flooding to violent storms, hurricanes and cyclones. Due to inherent vulnerabilities and the persistent lack of capacity to strengthen resilience, these disasters can in minutes wipe out development gains that took decades to achieve.

The Sendai Framework for Disaster Risk Reduction was adopted in 2015 specifically to overcome this challenge, with the lofty goal of substantially reducing of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.

However, as we are halfway through the timeline for implementation of the Framework, it is alarming to note the limited progress has been made in the countries that are most vulnerable to disasters. So far, only a third of all SIDS are covered by early warning systems, and there is varied and uneven progress across SIDS towards achieving the Sendai Targets. Furthermore, the vulnerabilities and challenges faced by SIDS have been exacerbated by ongoing global events, including anthropogenic climate change, the COVID-19 Pandemic, geopolitical tensions and the impending global recession.

With 2030 on the imminent horizon, there is an urgent need to identify the current gaps and challenges, in order to generate targeted actions that accelerate progress towards the Sendai targets. These actions should be solidified in the relevant instruments that enable implementation, including the intergovernmentally negotiated outcome of the Midterm Review of the Sendai Framework in 2023, and the new sustainable development blueprint for SIDS, which will be adopted at the Fourth SIDS Conference hosted by Antigua and Barbuda in 2024.

The present report has been prepared with these objectives in mind, through consultations with the relevant Sendai Focal Points from SIDS. The findings underscore the specific challenges that

SIDS face in implementing the Sendai Framework, including the lack of human, institutional and technological capacity, the inadequacy of investments and financial resources, and persistent constraints in data generation and analysis. It also provides concrete recommendations on how to address these challenges, through the support of the international community and the UN System.

It is therefore a useful guide for charting a more resilient development pathway for SIDS, based on the current challenges we face. It is my hope that the findings and recommendations in this report will be given due consideration in the relevant global discourse on Disaster Risk Reduction, with the aim of ensuring that the lives, livelihoods and sustainable development gains are preserved in SIDS, when faced with disasters in the future.



**H.E. Mr. Walton  
Alfonso Webson**

Chair of the Alliance of Small  
Islands States (AOSIS)

Permanent Representative of  
Antigua & Barbuda to the United  
Nations.

# ACRONYMS

<b>ACS</b>	Association of Caribbean States
<b>ADB</b>	Asian Development Bank
<b>ARC</b>	African Risk Capacity
<b>AWS</b>	Automatic Weather Station
<b>BMCs</b>	Borrowing Member Countries
<b>CANARI</b>	Caribbean Natural Resources Institute
<b>CARICOM</b>	Caribbean Community
<b>CARiDRO</b>	Caribbean Assessment of Regional Drought Tool
<b>CCCCC</b>	Caribbean Community Climate Change Centre
<b>CCORAL</b>	Caribbean Climate Online Risk and Adaptation Tool
<b>CCRIF</b>	Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company
<b>CDB</b>	Caribbean Development Bank
<b>CDEMA</b>	Caribbean Disaster Emergency Management Agency
<b>CDMCHC</b>	Comprehensive Disaster Management Coordination and Harmonisation Council
<b>CFR</b>	Country Financing Roadmap
<b>CIF</b>	Climate Investment Funds
<b>CIMH</b>	Caribbean Institute for Meteorology and Hydrology
<b>COAST</b>	Caribbean Oceans and Aquaculture Sustainability Facility
<b>CRAIC</b>	Climate Risk Adaptation and Insurance in the Caribbean
<b>CREWS Project</b>	Climate Risk and Early Warnings Project
<b>DFC</b>	U.S International Development Finance Corporation
<b>DRR</b>	Disaster Risk Reduction
<b>DRRC</b>	Disaster Risk Reduction Centre
<b>EKACDM</b>	Enhancing Knowledge and Application of Comprehensive Disaster Management
<b>ESCAP</b>	United Nations Economic and Social Commission for Asia and the Pacific
<b>ESRI</b>	Environmental Systems Research Institute
<b>EU-GCCA</b>	European Union Global Climate Change Alliance
<b>EVI</b>	Economic Vulnerability Index

<b>EWS</b>	Early Warning Systems
<b>FDI</b>	Foreign Direct Investment
<b>FREDI</b>	Etudes et Recherches sur le Développement International
<b>FRDP</b>	Framework for Resilient Development in the Pacific
<b>FSGB</b>	Fiji's Sovereign Green Bond
<b>GCF</b>	Green Climate Fund
<b>GEF</b>	Global Environment Facility
<b>GFDRR</b>	Global Facility for Disaster Reduction and Recovery
<b>ICT</b>	Information Communications Technology
<b>IMF</b>	International Monetary Fund
<b>ITU</b>	International Telecommunications Union
<b>JNAP</b>	Joint National Action Plans
<b>LDC</b>	Least developed country
<b>MDTF</b>	Multi-Donor Trust Fund
<b>MIC</b>	Middle-income country
<b>MTR SF</b>	Midterm Review of the Sendai Framework
<b>MVI</b>	Multidimensional Vulnerability Index
<b>NbS</b>	Nature-Based Solution
<b>NDMA</b>	National Disaster Management Agency
<b>NDMO</b>	National Disaster Management Office
<b>NEOC</b>	National Emergency Operation Centre
<b>NIWA</b>	National Institute of Water and Atmospheric Research
<b>NMHS</b>	National Meteorological and Hydrological Services
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NWP</b>	Numerical Weather Prediction
<b>ODA</b>	Official Development Assistance
<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>PICCIF</b>	Pacific Islands Climate Change Insurance Facility
<b>PICSES</b>	Powering Innovations in Civil Society and Enterprises for Sustainability in the Caribbean
<b>PIEMA</b>	Pacific Islands Emergency Management Alliance
<b>PMC</b>	Pacific Meteorological Council
<b>PTWC</b>	Pacific Tsunami Warning System
<b>REAP</b>	Risk-informed Early Action Partnership
<b>RIMES</b>	Regional Integrated Multi-Hazard Early Warning System for Africa and Asia
<b>SAMOA Pathway</b>	SIDS Accelerated Modalities of Action Pathway
<b>SCCF</b>	Special Climate Change Fund
<b>SDG</b>	Sustainable Development Goal
<b>SDIP</b>	Sustainable Development Investment Partnership
<b>SGP</b>	Small Grants Programme



<b>SIDS</b>	Small Island Developing States
<b>SPC</b>	The Pacific Community
<b>SPREP</b>	Secretariat of the Pacific Regional Environment Programme
<b>TMS</b>	Tonga Meteorological Service
<b>UN</b>	United Nations
<b>UNDP</b>	United Nations Development Programme
<b>UNDRR</b>	United Nations Office for Disaster Risk Reduction
<b>USAID</b>	United States Agency for International Development
<b>VHT</b>	Vanuatu Humanitarian Team
<b>WMO</b>	World Metrological Organization

# EXECUTIVE SUMMARY

---

Small island developing states (SIDS) are some of the world's most disaster-prone countries.<sup>1</sup> SIDS have high levels of exposure and vulnerability to hazards, such as cyclones, sea-level rise, earthquakes, tsunamis, and marine hazardous material spills.<sup>2</sup> Due to their small size, remoteness, spatial isolation, and dependence on trade, SIDS are particularly vulnerable to shocks and stressors (see Section 2). This vulnerability has been exacerbated by the COVID-19 pandemic, which has disproportionately impacted SIDS' economies.<sup>3</sup> As climate-related disasters increase in frequency and intensity,<sup>4</sup> intensifying pressures on states that are already confronted by unique social, economic, and environmental vulnerabilities,<sup>5</sup> it is necessary to address current challenges and constraints, and leverage opportunities to build resilience.

The Sendai Framework for Disaster Risk Reduction 2015-2030<sup>6</sup>, provides the global blueprint for disaster risk reduction (DRR), and is critical to enable the attainment of the 2030 Agenda.<sup>7</sup> It reflects the global consensus on how to reduce risk and prevent hazards from causing disasters, managing residual risk through

preparedness for response, and to "build back better" in recovery, rehabilitation and reconstruction.

**In order to support SIDS' sustainable development, it is necessary to address the constraints they face in implementing the Sendai Framework and strengthening DRR.** DRR has been acknowledged by the Small Island Developing States Accelerated Modalities of Action (SAMOA) Pathway, which serves as the internationally agreed to programme of action for small island developing states for the decade 2014 – 2024,<sup>8</sup> as a key theme. The 2021 Alliance of Small Island States (AOSIS) Leaders' Declaration further reinforces the significance of managing disaster risk in SIDS: "Reaffirm the call by the United Nations General Assembly for the development of a targeted voluntary disaster fund, mechanism or financial instrument, coordinated with and complementary to existing mechanisms, to assist SIDS in managing disaster risk and building back better after disasters, recognizing the economic challenges, including unsustainable debt levels, arising in part from extreme weather events and slow-onset events"<sup>9</sup>

---

<sup>1</sup>UNCTAD. 2020. Slany, A. Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No 55. Available online at: [https://unctad.org/system/files/official-document/ser-rp-2020d14\\_en.pdf](https://unctad.org/system/files/official-document/ser-rp-2020d14_en.pdf)

<sup>2</sup>Shultz, J.M., Cohen, M.A., Hermosilla, S., Espinel, Z., McLean, A. Disaster risk reduction and sustainable development for small island developing states. *Disaster Health*. 2016 Apr 8; 3(1): 32-44.

<sup>3</sup>DGFF. 2021. UNCTAD Development and Globalization: Facts and Figures. Available online at: <https://dgff2021.unctad.org/>

<sup>4</sup>UNDRR. 2022. Sendai Framework Voluntary Commitments Synthesis and Analysis Report.

<sup>5</sup>AOSIS. About Small Island Developing States. Available online at: <https://www.un.org/ohrrls/content/about-small-island-developing-states>

<sup>6</sup>The Sendai Framework was adopted at the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan in 2015

<sup>7</sup>UN Member States adopted the 2030 Agenda for Sustainable Development at the UN General Assembly, in September 2015. The 2030 Agenda serves as a global call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. Additional information on the 2030 Agenda can be found at the following link: <https://sdgs.un.org/2030agenda>

<sup>8</sup>UNSD. SIDS Accelerated Modalities of Action (SAMOA) Pathway. Available online at: <https://sustainabledevelopment.un.org/samoapathway.html>

<sup>9</sup>AOSIS. 2021. Leaders' Declaration 2021. Available online at: <https://www.aosis.org/launch-of-the-alliance-of-small-island-states-leaders-declaration/>

## **Purpose of the Assessment**

To strengthen DRR policies and programs in SIDS, it is necessary to identify the achievements, challenges, constraints, and gaps that SIDS face in the **means of implementing** the Sendai Framework. This gap assessment will seek to document, synthesize, and consolidate SIDS' experiences and constraints to form a repository where shared concerns and specific national examples illustrating barriers are captured.

The **means of implementation** (or MOI) are the entry point by which this assessment examines the experience of SIDS in implementing the Sendai Framework. The rationale is that **unless the means of implementation are strategically improved and strengthened, countries will face continuous challenges in implementing the Sendai Framework** and other future agreements, leading to inefficient target-setting. The MOI provides a lens by which to identify specific needs and achievements relative to integral aspects of DRR.

The means of implementation examined in this section are derived from the Sendai Framework and the SAMOA Pathway, which include access to: (i) financial resources; (ii) capacity; (iii) data & technology; (iv) partnerships and platforms of cooperation. This is also in line with the means of implementation identified in the High-Level Political Declaration on the Midterm Review of the SAMOA Pathway, which identifies the need to create an enabling environment "to facilitate and attract foreign direct investment and financing, and capacity support for small island developing States"; as well as the need to strengthen cooperation, capacity and investment in disaster risk management.<sup>10</sup>

The ongoing Midterm Review of the Sendai Framework for Disaster Risk Reduction (MTR SF), launched in October 2021 and culminating in a high-level meeting of the General Assembly in May 2023, is an optimal time to review what **challenges prevent or enhance SIDS' abilities to implement the Sendai Framework**. This will help improve strategic support in the next seven years of implementation of the Sendai Framework to achieve concrete results for improved DRR, and support corrective measures. Without acknowledging SIDS'-specific needs and challenges, and supporting course correction, there is the risk that DRR interventions in SIDS will not be optimized, nor will they deliver the results needed to lower levels of risk. This

document is being drafted concurrently to the Main Report of the MTR SF and will highlight a SIDS-specific lens.

This gap assessment is also timely for the 4<sup>th</sup> International Conference on SIDS in 2024, which will serve as the platform to launch the next international agenda for SIDS. It is anticipated that this document will support the preparatory discussions on how to strengthen the means of implementation in DRR, in order to reduce disaster risk and build resilience.

The report is intended for practitioners, policymakers, researchers, advocates and those working on issues related to DRR and sustainable development in SIDS.

## **Structure of the Report**

The report is organized in four main sections:

- **Part 1** provides context and an introduction to the subject matter, the purpose of the report, the methodology employed, and why SIDS' relationship to the means of implementation, relative to the Sendai Framework and SAMOA Pathway, are examined.
- **Part 2** highlights SIDS' unique vulnerabilities to frame the constraints to means of implementation addressed in the following section.
- **Part 3** examines specific constraints, challenges and best practices relative to means of implementation of the Sendai Framework. Country examples are provided to substantiate the challenges identified. For ease of reference, summary boxes are provided in each sub-section of Part 3, capturing the main findings and points of discussion.
- **Part 4** provides conclusions, a recapitulation of all constraints and lessons learned, as well as the key advocacy messages on behalf of SIDS that should be considered in international sustainable development fora.

## **Constraints observed relative to Means of Implementation (MOI)**

SIDS' capacities and abilities to implement successful DRR initiatives vary. However, it is apparent after reviewing the literature, and through country experiences, that greater support is needed to strengthen the MOI to implement the Sendai Framework.

---

<sup>10</sup>UN. 2019. High-Level Political Declaration on the Midterm Review of the Samoa Pathway. Available online at: <https://www.un.org/pga/73/wp-content/uploads/sites/53/2019/08/SAMOA-MTR-FINAL.pdf>

## Financial Resources

SIDS are incredibly resourceful when it comes to mobilizing resources for their development, given how limited their economic base has historically been. They are exceptionally reliant on development assistance, remittances and international financial support. Yet, financing for DRR remains a challenge. As severe climate events increase, recessions and inflation loom, and as countries seek to recover from socioeconomic and health impacts of the COVID-19 pandemic, donors face growing demands.

As a result, **financing for DRR in SIDS has to be strategic, sustainable, and has to take into account the barriers that have prevented optimization of resources**, while acknowledging the necessity of funds for SIDS who by dint of their geography and remoteness do not have multi-varied economies and sources of financing. Concessional financing, for instance, continues to be a challenge for SIDS with small human resources. It is difficult for limited staff to apply for and manage complex and duplicative funding/reporting requirements. The requirements for co-financing, eligibility requirements, and application for simultaneous grants, make it challenging for SIDS to access resources needed for DRR. Often historic ties influence which SIDS receive funding from which donors, and many are subject to project delays due to lengthy project development and approval processes. Managing several short-term projects can drain human resources, foster a project-based approach to DRR, rather than a programmatic one, and can lead to some SIDS implementing donor-driven priorities.

There is also the challenge that **financing does not match the scale of existing and future disaster risks**, as most disaster funding is allocated to recovery and response, rather than risk reduction or prevention. The ad-hoc nature of recovery funding, and the fact that it does not meet post-disaster needs, indicates that financing for DRR is imbalanced. Similarly, while climate change adaptation (CCA) funds and DRR funds may be contributing to similar objectives, a greater variety of funds are available for CCA. This causes redundancy of activities, lack of integration of DRR, and the inability to holistically measure DRR activity without appropriate indicators. The current approach to funding disaster risk reduction is lagging behind the rapid rate of creation and increasing complexity of disaster risk.

**Private sector resources, though transforming and increasingly aware of disaster risk, are still inadequate for addressing DRR needs.** Capital market investments do not account for disaster risk. Insurance has been evolving and could potentially play a greater role in DRR, however risk insurance facilities require external support to deliver commitments. Self-insurance-sovereign wealth funds, disaster funds, and/or stabilization funds that countries invest in are not sufficient to address the cost of severe disasters. Insurance by smaller entities for personal and business property may offer premiums that are too high for people to afford, and micro insurances may not be able to finance the cost of destruction from severe hazards. While momentum is gaining across the insurance industry to mainstream and operationalize DRR in its offerings, there is a need for further development of products that incentivize risk reduction and prevention, such as through variable pricing and policy prerequisites, or exemptions to provide incentives for risk reduction.<sup>11</sup> For the emergency risk facilities that currently exist, SIDS' capacity constraints prevent them from accessing them easily. Microfinancing for DRR remains at the nascent stage and is supported by larger financial institutions or development partners in SIDS. Cost-benefit analyses conducted for the Asia and Pacific region, have shown ratios of 1:2, to as high as 1:55, in terms of the benefits from investing in disaster-resilient measures,<sup>12</sup> but this is not manifested in financing for DRR in SIDS. It is inadequate for the implementation of multi-hazard, prevention-oriented disaster risk reduction strategies to remain focused on reactive measures, such as contingency funds, insurance and catastrophe bonds to finance post-disaster response and recovery.

**Innovative financing solutions, such as green bonds, blue bonds and debt-swap opportunities are being developed and could serve DRR measures in SIDS.** However, many of these are in nascent stages. DRR requires political finessing to be considered as an investment that can prove profitable returns in the future. Such innovative tools still require backing from other institutions that can guarantee loans.

---

<sup>11</sup>The International Cooperative and Mutual Insurance Federation/UNDRR. 2020. From protection to prevention: The role of cooperative and mutual insurance in DRR. Available online at: <https://www.undrr.org/publication/protection-prevention-role-cooperative-and-mutual-insurance-drr>

<sup>12</sup>ADB. 2020. Financing Disaster Risk in Asia and the Pacific: A Guide for Policy Makers. Available online at: <https://www.adb.org/sites/default/files/institutional-document/670596/financing-disaster-risk-reduction-asia-pacific.pdf>

Processes to secure loans require complex negotiations that could take years. Innovative financing tools must also address the problem of indebtedness that most SIDS face. As noted by ECLAC-UN: "Middle-income countries, such as those in Latin America and the Caribbean, require multilateral cooperation through the expansion and redistribution of liquidity and debt reduction to enhance their policy space to foster a sustainable recovery and advance their economic and social development."<sup>13</sup>

### Recommendations for accessing financial resources for DRR by SIDS:

- Application requirements for concessional funding should be streamlined and consistent to avoid additional cost of time and resources for SIDS to apply. Greater coherence in donor requirement processes will reduce transaction costs and delays, and will foster greater alignment in the sustainable development arena.
- The uniqueness of SIDS must be considered in DRR project funding: co-financing requirements should be reduced; project timelines should be extended to account for travel/procurement to remote and isolated islands; project management budgets should be increased from current limitations due to high costs in delivering projects in SIDS.
- Numerous short-term projects are onerous for SIDS. A programmatic, more long-term approach should be encouraged to deliver demonstrable results, avoid costly project preparation processes, and promote sustainability.
- International financial institutions, development banks, and the private sector should focus on DRR financing instruments that include risk reduction and prevention bonds, blended financing tools, pooled funds, guidance and methodologies to include DRR in the decisions of business and institutional investors to meet the scale of financing needed to prevent and reduce risks, and build resilience to current and future shocks and hazards. Central banks and credit rating agencies should align strategies and operations with the Sendai Framework to ensure that they prioritize risk reduction for SIDS.
- Disaster risk reduction financing by donors requires a multi-layered approach that should blend ex-ante and ex-post financing.

- Integration of DRR indicators within CCA activities should be common practice to measure the mutually beneficial impact of investments and avoid maladaptation to climate change.
- Debt reduction should be considered as part of DRR measures given the high levels of indebtedness SIDS face.
- There should be flexibility on the part of donors and national governments to integrate DRR into other financing windows: e.g., for biodiversity protection, sustainable land management, (nature-based solutions), agricultural development, and conflict prevention.

### Capacity

SIDS face tremendous challenges in generating and retaining capacity. The first challenge is that of **human resources**: there are limited job opportunities, challenges in retaining skilled staff including due to emigration ("brain drain"), small populations from which to draw expertise, which result in a limited number of qualified staff working in key capacities. In many countries, there are few people carrying out numerous tasks, while lack of staffing results in losing out on opportunities to attract concessional financing, monitor projects, design initiatives, consult with stakeholders, and poses challenges in processing and coordinating international aid and post-disaster efforts. There is a reliance on consultants and volunteers, which can mean high turnover, ongoing training costs, and inconsistency. Further, financing for risk reduction, including planning for risk-informed recovery requires data, modelling, long-term planning, cost analyses, many of which are difficult with limited staff, especially when confronted with immediate response and recovery efforts. DRR requires a range of analytical expertise which may be difficult to attract and retain.

In terms of **data generation and analysis**, SIDS face a lack of storage and access to data, a lack of digitization, and difficulty in generating and accessing cross-sectoral data. DRR-related data is generally not standardized, and there is a shortage of skilled human capital to manage data technologies. Project-based culture in SIDS further fosters disparate and disaggregated pools of information, which does not allow lessons learned to be upscaled. Some SIDS face data privatization (e.g. telecommunications), and

<sup>13</sup>ECLAC/UN. 2021. An Innovative Financing for Development Agenda for the Recovery in Latin America and the Caribbean. Available online at: [https://repositorio.cepal.org/bitstream/handle/11362/47490/S2100627\\_en.pdf?sequence=3&isAllowed=](https://repositorio.cepal.org/bitstream/handle/11362/47490/S2100627_en.pdf?sequence=3&isAllowed=)

many are inundated with many interoperable portals, databases, and too much content that is not user-friendly. Many SIDS are unaware of all the DRR and climate-related data available and may not be sufficiently leveraging information from regional hubs, research institutes, and meteorological centers.

In terms of **specific data and information needs**, SIDS have expressed the need for additional data on assessing loss and damage, hazard and vulnerability assessments, and vulnerability and risk mapping and environmental impacts. Some SIDS lack historical data—others do not have DRR-related data in digitized form, and there is a general demand for stronger baseline and socioeconomic data. Overall support is required to increase risk analysis and develop a better understanding of systemic and multi-hazard risk to inform policy-making. Down-scaled data and applied data is missing for many SIDS. Indigenous knowledge is not sufficiently leveraged to inform DRR measures—some SIDS are missing out on indigenous and citizen science that could improve DRR interventions. Finally, there is a lack of data on the investment potential of DRR which could otherwise be used to attract funds and action on DRR measures.

SIDS' potential to **access technology** and innovation has grown through projects, partnerships and technology investments. However, SIDS generally require improvement in: (i) hydrometeorological hazard monitoring, forecasting infrastructure and technologies; (ii) the expansion of observing and monitoring networks; (iii) telecommunication systems; and (iv) hydrological and meteorological data and related hazard data collection, storage, processing, management and transmission systems. Technologies and systems for now-casting, such as radar systems and lightning detectors, to monitor moving severe weather events such as lightning, thunderstorms, heavy and intense rainfall, are also necessary as climate change increases frequency of heavy rains.

There are several **barriers to optimizing technologies**: Maintenance costs, upgrading, and asset deterioration is costly for countries. Often there is a dependency on donors for technologies which can lead to procurement delays, expiration of warranties, and the need for tandem trainings which may themselves be delayed or insufficient. There is a dependency on regional hubs for data, if those are available. There are logistical challenges of internet

connectivity, of remote weather stations and technologies being damaged by extreme events. SIDS have to contend with intellectual property issues and obsolescence, and often interoperable baseline technologies are needed to accommodate new technologies or systems.

**Communications and infrastructure** are a key part of supporting DRR; remoteness, geographic dispersion and dependency on few communications cables leaves SIDS highly dependent on communications infrastructure. Addressing vulnerability of communications systems is critical as hazards may cut SIDS off from other countries and resources, depriving populations of warnings, support and essential services. Critical infrastructure such as transportation systems, power lines, pipelines, and reservoirs are at risk of natural hazards, and this is exacerbated by aging infrastructure, poor maintenance and reinforcement, and the establishment of telecommunications infrastructure in hazard-prone areas.



## Recommendations on capacity issues

- Greater alignment and/or partnerships are needed between national DRR needs and tertiary education institutions to identify short-, medium- and long-term gaps, and to formulate related skills development plans. Many SIDS have tertiary institutions that can foster expertise that is needed at a national scale, but complementarity, funding, and recognition of national certification is needed.
- Flexible arrangements among donors and technical support facilities are needed to build capacity of a larger and diverse pool of staff. There are sometimes gender or number limitations, with SIDS only being able to recommend 1 or 2 people in key trainings.
- Training of trainers, or the inclusion of more people will allow skills development for a larger number of staff, to offset high turnover or emigration. COVID-19 has demonstrated that some trainings can take place remotely and this should be leveraged as much as possible.
- Incentives for staff retention should be enacted, especially non-financial incentives in contexts where increasing salaries are not possible. Economic incentives and career opportunities abroad are a major reason why many leave their countries and innovative retention practices (e.g., recognition, paid holidays, career development and training, children's schooling) should be further developed.
- Preparing and upskilling current and future labour force should be a priority for green transition to sustainability and building resilience.
- Sustainability plans must accompany the acquisition of new technology. Reducing disaster risk must include cost-effective ways to future-proof new development and retrofit existing infrastructure to withstand current and emerging climate and disaster risks.
- Mapping exercises should be carried out to identify free global data available (providers and types of data available).

## Institutional Constraints

**Intersectoral mainstreaming of DRR remains a challenge** and DRR is often not regarded as a salient issue in non-emergency times. DRR does not carry the same political weight as climate change, and can be disregarded as a weather or disaster management issue. Mandates of reporting on DRR are often unclear and disaster management authorities typically have little to no

enforcement capacity. Institutions have low absorptive potential for capacity building and data integration. Indigenous knowledge is not sufficiently integrated into national DRR policies, and indigenous participation may be limited to project design, without meaningful engagement of indigenous communities through the life of a project, and/or may only include the involvement of leadership and not necessarily the most marginalized.

**Monitoring and Reporting** on DRR/SDG indicators does not provide a fulsome picture of how countries are performing at the local level, as SIDS lack data and provide incomplete reports. Often reporting against the Sendai Framework is seen as the end, rather than the reporting guiding policy outcomes; often data is generated after the fact, for reporting processes, not for guiding policy-making. Disaster management authorities are often understaffed for monitoring. While DRR is an intersectoral issue other sectors tend not to monitor their DRR expenses or activities, and do not report them centrally. Reporting on the Sendai Framework Monitor is incomplete/skewed for most SIDS. For some, annual reporting on Targets E and F is too intensive and unrealistic, especially if some of the results are derived from 5-year projects or initiatives. In 2021, several SIDS reported that no data was submitted to the Sendai Framework Monitor for Target E. There are also many other frameworks and projects to report on which is labour-intensive for disaster management authorities. It is not always clear for countries on how aggregate findings from the Sendai Framework Monitor are used or should be applied.

## Recommendations on institutional constraints

- SIDS should strengthen strategic foresight capabilities to develop policymaking in the context of uncertainty to prepare for a variety of possible developments and support risk-informed decision-making. The recommendations outlined in the Secretary-General's Report on "Our Common Agenda" should be leveraged to conduct this work.
- Reporting on multiple international frameworks should be streamlined to avoid onerous labour on limited staff.
- Reporting requirements for international frameworks should take country circumstances into account. If reporting is consistently incomplete, reporting requirements should be re-considered.

- Reporting on international frameworks should not be the end goal; it is essential that reporting drive decision-making. SIDS need support to design reporting practices that inform national policy-making, rather than just fulfill international reporting requirements.
- The political salience of DRR needs to be increased in SIDS to promote intersectoral and whole-of-society support. This requires clear messaging on the centrality of DRR to sustainable development.
- Disaster statistics should be part of national statistics collection. Engagement of national statistical offices to validate and integrate Sendai Framework monitor data into official national statistics can enhance the use of disaster loss data by decision-makers in all sectors.

### Partnerships

Many SIDS benefit from partnerships, particularly at the regional level to strengthen DRR capacities. Some constraints exist and prevent the optimization of these MOI, including (i) lack of awareness of all the technology partnerships and collaborations available to them; (ii) staff and resource limitations to manage numerous partnerships; and (iii) lack of meaningful engagement with indigenous or marginalized communities, as well the private sector. There is also the tension that some projects may fund regional partnerships as opposed to financing national institutions which forgoes national capacity building.

### Recommendations on partnerships

- A mapping exercise of partnerships at the regional level to identify the scope of services, data, technology and financing support available to SIDS. Intersectoral focal points should be identified at the national level to liaise with specific partners, and to alleviate the burden on disaster management officials of managing multiple relationships. This exercise would also pinpoint any duplicative activities carried out with different partners.
- SIDS' monitoring capacity is low as per the reporting against the Sendai Framework. Partnerships should be leveraged to bolster monitoring capacity.





## **Key Messages**

There are SIDS-specific needs that can be addressed to improve access to means of implementing the Sendai Framework. While it is understood that all needs cannot be addressed, and that SIDS vary in the level to which they experience these constraints, it is necessary to note the impediments to improve implementation and avoid cycles of unmet targets.

The following key messages can be used in various sustainable development fora to better integrate DRR and improve access of MOI for SIDS.

Donors and donor agencies must consider the multi-dimensional vulnerability that SIDS face in accessing concessional financing.

- Debt reduction and restructuring should be integrated into DRR support to SIDS, given their high levels of indebtedness.
- Risk transfer cannot substitute instruments that finance the reduction of existing risk and the prevention of new risk. International financial institutions, development banks, and the private sector should focus on DRR financing instruments that include risk reduction and prevention bonds, blended financing tools, pooled funds, guidance and methodologies to include DRR in decisions of business and institutional investors. Central banks and credit rating agencies should align strategies and operations with the Sendai Framework to ensure that they prioritize risk reduction for SIDS.
- Application processes for concessional financing must be improved and simplified. Donors should harmonize templates and requirements to reduce time/labour costs which prevent SIDS from applying for available financing.
- DRR projects must take into account high costs of project implementation in SIDS. Project management costs and fees need to be higher in SIDS to account for elevated cost of project delivery due to remoteness, geographic dispersion, and limited HR; co-financing requirements should be lower.
- Dedicated disaster risk reduction financing strategies should be included and amalgamated in integrated national financing frameworks, with clear investment priorities.
- SIDS would benefit much more from a programmatic approach with sustained accompaniment than from multiple short-term projects.
- Climate adaptation financing should include DRR indicators and metrics to ensure value of investment. Climate financing can then contribute to long-term resilience, through supporting both adaptation and risk-reduction activities. This will allow SIDS to access more opportunities for DRR work, while supporting coherent and risk-informed adaptation.
- Nature-based solutions are an integral part of DRR. In the post-2020 Biodiversity Framework context, there is an opportunity for SIDS to highlight the relevance of DRR to biodiversity protection and natural resources management.
- Funds made available through biodiversity financing windows, should be open to DRR financing for an integrated and risk-informed approach to sustainable development.
- Reducing disaster risk must include cost-effective ways to future-proof new development and retrofit existing infrastructure to withstand current and emerging climate and disaster risks.  
SIDS should be supported in collecting, formalizing, mainstreaming and disseminating best practices of indigenous and local practices, and integrating citizen science for more informed DRR measures.
- Reporting requirements for DRR activities need to be rethought for SIDS if year after year, incomplete data and information is submitted.
- As countries "build back better" in the wake of the COVID-19 pandemic, recovery must be risk-informed in all sectors.
- The concrete progress on means of implementation for SIDS can be considered as an indicator to be measured in the follow-up to the MTR SF.

# PART 1: CONTEXT

---

Photo: UN Photo/Eskinder Debebe

## 1.Introduction

Small island developing states (SIDS) are some of the world's most disaster-prone countries.<sup>14</sup> SIDS have high levels of exposure and vulnerability to hazards, such as cyclones, sea-level rise, earthquakes, tsunamis, and marine hazardous material spills.<sup>15</sup> While SIDS exhibit substantial differences in terms of culture, populations, geographies, socio-political structures, and levels of economic development, they face many common challenges related to hazards, exposure, vulnerability and coping capacity.

Because of their small size, remoteness, spatial isolation, and dependence on trade, SIDS are particularly vulnerable to hazards (see Section 2). As climate-related disasters increase in frequency and intensity,<sup>16</sup> creating additional pressures on states that are already confronted by unique social, economic, and environmental vulnerabilities,<sup>17</sup> it is necessary to address challenges, constraints, and leverage opportunities to prevent and reduce risk and build resilience. With the negative impacts of the COVID-19 pandemic, which has disproportionately hit SIDS' economies,<sup>18</sup> it is urgent to reduce existing disaster risks, prevent new ones, and manage residual risk, which contribute to strengthening resilience and achievement of sustainable development.<sup>19</sup>

The Sendai Framework for Disaster Risk Reduction 2015-2030<sup>20</sup> (henceforth the Sendai Framework), provides the global blueprint for

disaster risk reduction (DRR), and is critical to enable the attainment of the 2030 Agenda.<sup>21</sup> The framework applies to the risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters caused by natural or man-made hazards, as well as environmental, technological and biological hazards and risk. It reflects the global consensus on how to reduce risk and prevent hazards from causing disasters, and managing residual risk through preparedness for response, and to "build back better" in recovery and rehabilitation. The Sendai Framework recognizes SIDS' particular vulnerabilities in its preamble: "Developing countries, in particular least developed countries, **small island developing states...need special attention and support to augment domestic resources through bilateral and multilateral channels.**"<sup>22</sup>

Despite this global recognition, SIDS' unique characteristics pose constraints to successful implementation of the Sendai Framework. This gap assessment will explore and identify the common constraints, gaps and opportunities which impact SIDS' access to the **means of implementation** of the Sendai Framework, in order to identify areas for improvement to strengthen DRR and support sustainable development. The **means of implementation** are the interdependent mix of financial, capacity building, technology, data, and inclusive trade,<sup>23</sup> which provide the enabling environment to implement the Sendai Framework and sustainable development (elaborated further in sub-section 1.3). **Strengthening means of**

---

<sup>14</sup>UNCTAD. 2020. Slany, A. Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No 55. Available online at: [https://unctad.org/system/files/official-document/ser-rp-2020d14\\_en.pdf](https://unctad.org/system/files/official-document/ser-rp-2020d14_en.pdf)

<sup>15</sup>Shultz, J.M., Cohen, M.A., Hermosilla, S., Espinel, Z., McLean, A. 2016. Disaster risk reduction and sustainable development for small island developing states. *Disaster Health*; 3(1)

<sup>16</sup>UNDRR. 2022. Sendai Framework Voluntary Commitments Synthesis and Analysis Report. Available online at: <https://www.undrr.org/publication/sendai-framework-voluntary-commitments-synthesis-and-analysis-report-2022>

<sup>17</sup>AOSIS. About Small Island Developing States. Available online at: <https://www.un.org/ohrrls/content/about-small-island-developing-states>

<sup>18</sup>DGFF. 2021. UNCTAD Development and Globalization: Facts and Figures. Available online at: <https://dgff2021.unctad.org/>

<sup>19</sup>UNDRR. Definition of Disaster Risk Reduction. Available online at: <https://www.undrr.org/terminology/disaster-riskreduction#:~:text=Disaster%20risk%20reduction%20is%20aimed,the%20achievement%20of%20sustainable%20development.>

<sup>20</sup>The Sendai Framework was adopted at the Third UN World Conference in Sendai, Japan in 2015

<sup>21</sup>UN Member States adopted the 2030 Agenda for Sustainable Development at the UN General Assembly, in September 2015. The 2030 Agenda serves as a global call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. Additional information on the 2030 Agenda can be found at the following link: <https://sdgs.un.org/2030agenda>

<sup>22</sup>Item 8 of the Preamble of the Sendai Framework for Disaster Risk Reduction 2015-2030. Available online at: <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>

<sup>23</sup>UN DESA. Capacity Development. Available online: <https://www.un.org/development/desa/cdpmo/what-we-do/areas-of-work/means-of-implementation#:~:text=The%20notion%20of%20'Means%20of,capacity%E2%80%90building%2C%20inclusive%20and%20equitable>

**implementation of the Sendai Framework, supports an enabling global environment that is systematically risk-informed, to support SIDS to achieve sustainable development goals and DRR objectives.** <sup>24</sup>

The Sendai Framework and preceding international frameworks have fostered global awareness of disaster risk and catalyzed action to manage systemic risk.<sup>25</sup> One aspect of this success is noted by the reduction in loss of life from disasters globally, and in the increasing adherence of countries to principles of 'building back better' in the aftermath of crises.<sup>26</sup> However, countries, and in particular SIDS, still report gaps in meeting the objectives of the Sendai Framework. There may be a variety of reasons for this including the lack of knowledge, capacity, data, or financial resources for addressing risks by some countries. Some SIDS prioritize activities around recent major disasters, and not on slow-onset risks or hazards that occur less frequently.<sup>27</sup> Others have yet to embed multi-hazard risk assessments within their core economic, environmental, social planning and investments, which impedes implementation of the Sendai Framework.<sup>28</sup> While some of these challenges may be shared by other countries, SIDS' unique characteristics pose impediments to fully accessing means of implementation.

Strengthening the means of implementation is critical not only for implementing the Sendai Framework, but is also in line with the Small Island Developing States Accelerated Modalities of Action (SAMOA) Pathway, which serves as the internationally agreed to programme of action for small island developing states for the decade 2014 - 2024.<sup>29</sup> DRR is identified as a key theme in the SAMOA Pathway, acknowledging that "SIDS grapple with the effects of disasters, some of which have increased in intensity and some of which have been exacerbated by climate change, which impede their progress towards sustainable development. We also recognize that

disasters can disproportionately affect small island developing States and that there is a critical need to build resilience, strengthen monitoring and prevention, reduce vulnerability, raise awareness and increase preparedness to respond to and recover from disasters."<sup>30</sup>

## 1.1 Purpose of the Assessment

The purpose of this assessment is to identify the achievements, challenges, constraints, and gaps that SIDS face in the means of implementing the Sendai Framework. This assessment will seek to document, synthesize, and consolidate SIDS' experiences and constraints to form a repository where shared concerns, and specific national examples illustrating barriers, can be captured.

The ongoing Midterm Review of the Sendai Framework for Disaster Risk Reduction (MTR SF), launched in October 2021 and culminating in a high-level meeting of the General Assembly in May 2023, is an optimal time to review what **challenges prevent or enhance SIDS' abilities to implement the Sendai Framework.** This will help improve strategic support in the next phase of the implementing cycle to achieve concrete results for improved DRR and support corrective measures. Without acknowledging SIDS'-specific needs and challenges, and supporting course correction, there is the risk that DRR interventions will not be optimized, nor will they deliver the type of results needed to lower levels of risk. Given that SIDS are the most disaster-prone countries in the world, it is necessary to prioritize their challenges for the health and security of communities and economies. In the face of climate emergency, the ongoing impacts of the COVID-19 pandemic and other emerging challenges, it is necessary to ensure that investments and activities in DRR yield optimal results to build resilience across all sectors, and that all sectors integrate DRR. This document is being drafted concurrently to the Main Report of the MTR SF, and will highlight a SIDS-specific lens.

---

<sup>24</sup>UNDRR. 2022. Sendai Framework Voluntary Commitments Synthesis and Analysis Report. Available online at: <https://www.undrr.org/publication/sendai-framework-voluntary-commitments-synthesis-and-analysis-report-2022>

<sup>25</sup>Glasser, R. 2020. BEYOND SENDAI. In P. Barnes (Ed.), A Pacific disaster prevention review (pp. 9–11). Australian Strategic Policy Institute. <http://www.jstor.org/stable/resrep25128.5>

<sup>26</sup>Ibid.

<sup>27</sup>Ibid.

<sup>28</sup>Ibid.

<sup>29</sup>UNSD. SIDS Accelerated Modalities of Action (SAMOA) Pathway. Available online at: <https://sustainabledevelopment.un.org/samoapathway.html>

<sup>30</sup>Ibid.

This gap assessment is also timely for the 4th International Conference on SIDS in 2024, which will serve as the platform to launch the next international agenda for SIDS. It is anticipated that this document will support the preparatory discussions on how to strengthen means of implementation in DRR to prevent and reduce risks and foster resilience.

## 1.2 Structure of the Report

The report is organized in four main sections. **Part 1** provides context and an introduction to the subject matter, the purpose of the report, the methodology employed, and why SIDS' relationship to the means of implementation relative to the Sendai Framework and SAMOA Pathway are examined. **Part 2** highlights SIDS' unique vulnerabilities to frame the constraints to means of implementation addressed in the following section. **Part 3** examines specific constraints and challenges relative to means of implementation of the Sendai Framework. Country examples are provided to substantiate the challenges identified. For ease of reference, summary boxes are provided in each sub-section of Part 3, capturing the main findings and points of discussion. **Part 4** provides conclusions, a recapitulation of all constraints and lessons learned, as well as the key advocacy messages on behalf of SIDS that should be considered in international sustainable development fora.

## 1.3 Methodology

This assessment includes both qualitative and quantitative data and involved three key aspects: (i) a literature review; (ii) gender-sensitive interviews and consultations; and (iii) information processing and elaboration of findings.

At the core of this assessment was a literature review of key documents, including but not limited to risk profiles from SIDS, project documents and evaluations. A variety of technical publications from UNCTAD, UNDP, UNDRR, UNEP, WHO, UNESCO, IISD, IPCC, IUCN, OECD, among others, were consulted (see Annex 1). Documents relevant to conventions and multilateral processes (SAMOA Pathway, Addis Ababa Action Agenda, UNFCCC and UNCTAD) were also examined to identify how SIDS are recognized as a special and unique group. Global Environment Facility (GEF) project reports and evaluations helped identify specific barriers SIDS face in strengthening their means of implementation, and how climate change projects may support DRR. Discussions and outputs from the recent Global Platform for Disaster Risk Reduction 2022 were reviewed to

integrate the latest reflections on DRR. These sources were triangulated and underpinned the elaboration of findings and literature review.

Key informants to the project were Sendai Framework focal points and other key disaster risk reduction authorities working at the national level, who have been liaised with throughout the process. Three regional workshops were held with the Pacific, Caribbean and the African, Indian Ocean and South China Seas region (AIS), respectively, during which early findings on constraints were shared, and inputted on by attendees. The first draft of this document was shared with focal points to ensure that the documentation reflects country experiences.

Women were well-represented in regional consultations with over 50 % female participation.

Given the broad scope of means of implementation for achieving DRR objectives for all SIDS, the data collection for the development of the study should not be considered exhaustive. Instead, the information should be interpreted as illustrative of the gaps and constraints that SIDS are confronting and should be integrated into future planning and global processes.

## 1.3 Means of Implementation

Means of Implementation (or MOI) are the entry point by which to assess the challenges that SIDS face in implementing the Sendai Framework. The rationale is that **unless the means of implementation are strategically improved and strengthened, countries will face continuous challenges in implementing the Sendai Framework** and other future agreements, leading to inefficient target-setting. The MOI provides a lens by which to identify specific needs and achievements relative to integral aspects of DRR.

The Sendai Framework notes: "Developing countries, in particular the least developed countries, small island developing States, landlocked developing countries and African countries, as well as middle-income countries facing specific challenges, need special attention and support to augment domestic resources and capabilities through bilateral and multilateral channels in order to ensure adequate, sustainable, and timely **means of implementation in capacity-building, financial and technical assistance and technology transfer**, in accordance with international commitments."<sup>31</sup>

<sup>31</sup>N. Sendai Framework for Disaster Risk Reduction 2015-2030. Available online at: [https://www.preventionweb.net/files/43291\\_sendaiframeworkfordrren.pdf](https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf)



## Means of Implementation in the Sendai Framework

- (a) To reaffirm that developing countries need enhanced provision of coordinated, sustained and adequate international support for disaster risk reduction, in particular for the least developed countries, small island developing States, landlocked developing countries and African countries, as well as middle-income countries facing specific challenges, through bilateral and multilateral channels, including through enhanced technical and financial support and technology transfer on concessional and preferential terms, as mutually agreed, for the development and strengthening of their capacities;
- (b) To enhance access of States, in particular developing countries, to finance, environmentally sound technology, science and inclusive innovation, as well as knowledge and information sharing through existing mechanisms, namely bilateral, regional and multilateral collaborative arrangements, including the United Nations and other relevant bodies;
- (c) To promote the use and expansion of thematic platforms of cooperation, such as global technology pools and global systems to share know-how, innovation and research and ensure access to technology and information on disaster risk reduction;
- (d) To incorporate disaster risk reduction measures into multilateral and bilateral development assistance programmes within and across all sectors, as appropriate, related to poverty reduction, sustainable development, natural resource management, the environment, urban development and adaptation to climate change.

Based on these, one can infer the following thematic areas of MOI espoused in the Sendai Framework:

- **Finance and Partnerships**- Coordinated and sustained international support and financial resources for DRR, through bilateral and multilateral channels
- **Technical Transfer and Support**- Enhanced technical support and technology transfer on concessional and preferential terms; use and expansion of thematic platforms of cooperation, such as global technology pools and global systems to share know-how, innovation and research
- **Data, Knowledge Management and Capacity Building**- Access to science and inclusive innovation, as well as knowledge and information
- **Holistic and Comprehensive Approach to**

**DRR Integration of DRR** - Integration of DRR measures in development assistance programmes (including inter alia poverty reduction, sustainable development, natural resource management, the environment, urban development and adaptation to climate change.)

Means of implementation is conceptually used in other sustainable development fora as well, as key factors to attain sustainable development. The 2030 Agenda for Sustainable Development,<sup>32</sup> and the Addis Ababa Action Agenda (AAAA)<sup>33</sup> on Financing for Development, describe the 'Means of Implementation' (MOI) as the interdependent mix of financial resources, technology development and transfer, capacity-building, inclusive and equitable globalization and trade, regional integration, and the enabling environment required to implement the 2030 Agenda."

<sup>32</sup>UN DESA. Transforming Our World: The 2030 Agenda for Sustainable Development. Available online at: <https://sdgs.un.org/2030agenda>

<sup>33</sup>UN. 2015. Addis Ababa Action Agenda of the Third International Conference on Financing for Development. Available online at: [https://sustainabledevelopment.un.org/content/documents/2051AAAA\\_Outcome.pdf](https://sustainabledevelopment.un.org/content/documents/2051AAAA_Outcome.pdf)

They are identified under each sustainable development goal, as well as under the **SAMOA Pathway**, which identifies the following as **key MOI** to support the sustainable development of SIDS:

- Partnerships
- Financing
- Trade
- Capacity-building
- Technology
- Data and statistics
- Institutional support

Other conventions and fora have variations on these; this assessment will address the MOI identified in both the Sendai Framework and the SAMOA Pathway.

## 1.4 Concepts

The Open-ended Intergovernmentally Agreed Working Group on Terminology and Indicators relating to Disaster Risk Reduction (OIEWG), provides the definitions that are applied in this paper: **Disaster** is identified as a “serious disruption of the functioning of a community or a society at any scale **due to hazardous events** interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts.” The OIEWG further notes that “the effect of the disaster can be immediate and localized, but is often widespread and could last for a long period of time. The effect may test or exceed the capacity of a community or society to cope using its own resources, and therefore may require assistance from external sources, which could include neighbouring jurisdictions, or those at the national or international levels.”<sup>34</sup>

The Sendai Framework notes the following:

### **Types of Disasters Highlighted in the Sendai Framework**

**Small-scale disaster:** a type of disaster only affecting local communities which require assistance beyond the affected community

**Large-scale disaster:** a type of disaster affecting a society which requires national or international assistance

**Frequent and infrequent disasters:** depend on the probability of occurrence and the return period of a given hazard and its impacts. The impact of frequent disasters could be cumulative, or become chronic for a community or a society.

**Slow-onset disaster:** one that emerges gradually over time. Slow-onset disasters could be associated with, e.g., drought, desertification, sea-level rise, epidemic disease

**Sudden-onset-disaster:** triggered by a hazardous event that emerges quickly or unexpectedly and could be associated with, e.g., earthquake, volcanic eruption, flash flood, chemical explosion.

As defined by the OIEWG, a **hazard** is “a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Hazards can be natural, anthropogenic or socio-natural in origin.”<sup>35</sup> **Disasters, often follow hazards**, and are the result of a combination of hazards, conditions of vulnerability and the insufficient capacity to reduce negative consequences of the hazard.<sup>36</sup> Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyze and reduce the causal factors of disasters.<sup>37</sup>

This assessment also refers to **SIDS**, by which is meant a distinct group of 38 UN Member States,<sup>38</sup> which face unique social, economic, and environmental vulnerabilities.<sup>39</sup> First recognized in 1992 at the UN Conference on Environment and Development in Rio, they have been referred to as a **special case for sustainable development**.

<sup>34</sup>UNDRR. Available online at: <https://www.undrr.org/terminology/disaster#:~:text=A%20serious%20disruption%20of%20the,and%20environmental%20losses%20and%20impacts>.

<sup>35</sup>UNDRR. Terminology. Available online at: <https://www.undrr.org/terminology/hazard>

<sup>36</sup>UNESCO. Disaster Risk Reduction. Available online at: <https://en.unesco.org/disaster-risk-reduction>

<sup>37</sup>Ibid.

<sup>38</sup>In the Pacific region this includes: Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor Leste, Tonga, Tuvalu, Vanuatu. In the Caribbean region this includes: Antigua and Barbuda, Barbados, Bahamas, Belize, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago. In the Atlantic, Indian Ocean and South China Sea region, this includes: Bahrain, Cabo Verde, Comoros, Guinea-Bissau, Maldives, Mauritius, Sao Tome and Principe, Seychelles, Singapore.

<sup>39</sup>AOSIS. About Small Island Developing States. Available online at: <https://www.un.org/ohrrls/content/about-small-island-developing-states>

This acknowledgment of SIDS, formed the basis of the First UN Conference on the Sustainable Development of the SIDS, held in Barbados in 1994.<sup>40</sup> During the Rio + 20 Conference in 2012, this "special case" was re-emphasized, and included as part of Agenda 21.<sup>41</sup> A second conference on SIDS was held in Mauritius in 2005, and a Third International Conference on SIDS in Samoa in 2014, where the SAMOA Pathway was enshrined, affirming that "small island developing States remain a special case for sustainable development in view of their unique and particular vulnerabilities and that they remain constrained in meeting their goals in all three dimensions of sustainable development."<sup>42</sup>

**Vulnerability** is also a concept used throughout the assessment and (as per the work of the OIEWG) refers to "the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards." This assessment will also highlight the multi-dimensional vulnerability of SIDS and the compounding of vulnerabilities which is explored in Section 2.1.1.

---

<sup>40</sup>UNSDG. 1994. Barbados Programme of Action. Available online at: <https://sustainabledevelopment.un.org/conferences/bpoa1994>

<sup>41</sup>IISD. Conferences of the Sustainable Development of Small Island Developing States. Available online at: <https://enb.iisd.org/negotiations/conferences-sustainable-development-small-island-developing-states-sids>

<sup>42</sup>UN SDKP. SIDS Accelerated Modalities of Action (S.A.M.O.A) Pathway. Available online at: <https://sustainabledevelopment.un.org/samoapathway.html>





# PART 2:

## SIDS- A RATIONALE

---

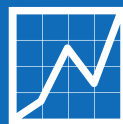
Photo: UN Photo/Sophia Paris



## 2. Why SIDS?



SIDS are the most disaster-prone countries in the world, and on average lose 2.1 % of their GDP annually due to disasters (UNCTAD, 2020)



SIDS are isolated, lack economies of scale, have high transportation and communication costs, and have limited means and capacity to implement comprehensive sustainable development goals (GEF)

### 2.1.1. Unique Vulnerabilities

SIDS are the most disaster-prone countries and on average lose 2.1 % of their GDP annually due to disasters.<sup>43</sup> The regularity and frequency of disasters creates unique challenges that are exacerbated due to their features: SIDS are generally small, with limited access to resources and economic diversity. They are often remote and isolated making it difficult to access resources, leading to high costs of transport and communication. Their remoteness also means that they are often endowed with unique biodiversity, marine and terrestrial ecosystems.<sup>44</sup> SIDS are also guardians of a large maritime environment, which offers coastal opportunities in the sectors of tourism, fisheries and trade, but also leaves them highly susceptible to sea-level rise, storm surges, meteorological hazards and coastal degradation.

SIDS are perceived to be most at risk from climate change—often experiencing the effects of anthropogenic and socio-natural environmental crises for which they bear little responsibility.<sup>45</sup> Taken together, these characteristics make SIDS economically, ecologically, socially and geopolitically susceptible, particularly to outside shocks and stressors.<sup>46</sup>

SIDS' economies typically depend on narrow and fragile resource bases and are subject to the vagaries of international trade. SIDS tend to export a small range of natural/primary products and depend heavily on tourism, fisheries, with some islands conducting mining and mineral extraction. The lack of diversification of economic sectors poses a significant threat: SIDS are disproportionately dependent on one or two industries. In Saint Lucia, for instance, tourism accounted for 40 % of the GDP before the COVID-19 pandemic. Similarly, in the Bahamas, Barbados and Jamaica, 34-48 % of GDP comes from tourism.<sup>47</sup> **Any given shock or stressor, such as the COVID-19 pandemic, can put the entire economy at risk.** The impact of a single shock can be observed in Fiji, where economic growth contracted by 19 % in 2020 due to COVID-19 closures. This was the most severe economic downturn in the country's history.<sup>48</sup> Pre-COVID-19, tourism contributed to approximate 34 % of Fiji's economy and employed about 26 % of the population.<sup>49</sup>

Ongoing crises also pose risks to future post-crisis financing. The costs of multiple disasters are difficult for donor countries to finance--leveraging ongoing resources for reconstruction and development activities requires significant mobilization of funds.<sup>50</sup>

<sup>43</sup>UNCTAD. 2020. Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No 55. Available online: [https://unctad.org/system/files/official-document/ser-rp-2020d14\\_en.pdf](https://unctad.org/system/files/official-document/ser-rp-2020d14_en.pdf)

<sup>44</sup>UNWTO. Small Island Developing States. Available online at: <https://www.unwto.org/sustainable-development/small-islands-developing-states#:~:text=They%20present%20three%20key%20characteristics,to%20strong%20tourism%20assets%20but>

<sup>45</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at: [https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>46</sup>GEF. GEF and Small Island Developing States. Available online at: <https://openknowledge.worldbank.org/bitstream/handle/10986/14831/333380ENGLISH0GEF1SIDS.pdf?sequence=1&isAllowed=y>

<sup>47</sup>IDB. 2020. Weathering the Coronavirus Storm in the Caribbean. Available online at: <https://www.iadb.org/en/improvinglives/weathering-coronavirus-storm-caribbean>

<sup>48</sup>World Bank. 2021. Kwakwa, V. Together for Fiji: COVID-19 and the Road to Recovery. Available online at: <https://blogs.worldbank.org/eastasiapacific/together-fiji-covid-19-and-road-recovery#:~:text=According%20to%20the%20World%20Bank's,severe%20in%20the%20country's%20history>

<sup>49</sup>Gounder, R. 2020. Economic Vulnerabilities and Livelihoods: Impact of COVID-19 in Fiji and Vanuatu. Oceania, Vol. 90, Issue 1. Available online at: <https://onlinelibrary.wiley.com/doi/10.1002/ocea.5273>

<sup>50</sup>UNCTAD. Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No. 55, 2020 Available online at: <https://unctad.org/webflyer/multiple-disasters-and-debt-sustainability-small-island-developing-states>

With anticipated increases of climate-related natural hazards, there is a risk that sufficient funds will not be available to support recovery in all SIDS, possibly leading to social inequities, poor policy outcomes, and the forgoing of investments in crucial sectors.

Despite many SIDS having graduated to middle-income countries, the costs of direct and indirect losses from disasters, caused by natural hazards, tend to outweigh national increases in GDP. Hazards can occur simultaneously, and their impacts can proliferate and cascade, especially when coupled with other natural, man-made, environmental, technological, and biological hazards and risks.<sup>51</sup> This compounds the economic fragility of SIDS, and increases the exposure and vulnerability of populations through temporary and/or permanent losses to the productive economic sectors, national public and private infrastructure and assets.<sup>52</sup> Moreover, economic losses from disasters are not fully reported in SIDS—the underestimation of losses mean that losses may be higher than known.<sup>53</sup>

SIDS also face significant challenges in mobilizing domestic resources and accessing capital markets<sup>54</sup>, limiting resources for resilience-building and sustainable development. They tend to have small and erratic domestic revenues, which pose challenges given the high costs in providing public services and the fiscal impacts of disasters.<sup>55</sup>

### **GDP Unable to Capture Vulnerability in SIDS**

The concept of vulnerability can vary from SIDS

to SIDS. According to the work of the OIEWG on Terminology and Indicators relating to DRR, vulnerability is the condition determined by the physical, social, economic and environmental factors/processes which increase the susceptibility of an individual, community, assets or systems to the impact of hazards.<sup>56</sup> GDP indicators are often used to assess the health of economies and vulnerability. In the case of SIDS, however, GDP indicators do not capture their susceptibility to disasters. The limitation and challenges for SIDS have been that some perform well by GDP indicators or income per capita.<sup>57</sup> The Seychelles, for instance, before COVID-19, was deemed a high-income country,<sup>58</sup> and most SIDS are identified as middle-income countries, but these figures do not capture their domestic vulnerabilities such as proneness to disaster, economic vulnerability, ecological fragility and dependency on other states for goods and services.<sup>59</sup> This results in many SIDS not being eligible for concessional financing because they are classified as middle-or high-income countries,<sup>60</sup> while their underlying vulnerability and exposure to disasters is under-estimated. This is a point reinforced by SIDS such as Fiji, where the leadership has called for countries to be classified on the basis of their vulnerability, rather than as middle-income (MICs) or least developed countries' (LDCs) status.<sup>61</sup>

The recognition that SIDS are far more vulnerable than income data accounts for, is captured in the work underway by the United Nations and the High Panel on the Development of a **Multidimensional Vulnerability Index (MVI)**.

---

<sup>51</sup>Hook, S. 2021. Disaster Risk Financing for Small Island Developing States. Available online at: [https://sdgs.un.org/sites/default/files/2022-01/Disaster\\_Risk\\_Financing\\_forSIDS\\_DraftFinalReport.pdf](https://sdgs.un.org/sites/default/files/2022-01/Disaster_Risk_Financing_forSIDS_DraftFinalReport.pdf)

<sup>52</sup>Ibid.

<sup>53</sup>UNDRR. 2021. International Cooperation in Disaster Risk Reduction, United Nations Office for Disaster Risk Reduction.

<sup>54</sup>OECD. 2018. Making Development Co-Operation Work for Small Island Developing States. OECD Publishing, Paris. Available online at: <https://www.oecd.org/dac/making-development-co-operation-work-for-small-island-developing-states-9789264287648-en.htm>

<sup>55</sup>Ibid.

<sup>56</sup>UNDRR. Terminology. Available online at: <https://www.undrr.org/terminology/vulnerability>

<sup>57</sup>UNCTAD. 2004. Is a Special Treatment of Small Island Developing States Possible? (2004) Available online at: [https://unctad.org/system/files/official-document/ldc20041\\_en.pdf](https://unctad.org/system/files/official-document/ldc20041_en.pdf)

<sup>58</sup>AIS Regional Workshop. November 2021.

<sup>59</sup>IISD. Mead, L. 2021. Small Islands, Large Oceans: Voices on the Frontlines of Climate Change. Available online at: <https://www.iisd.org/system/files/2021-03/still-one-earth-SIDS.pdf>

<sup>60</sup>UNDP. Assa, J. & Meddeb, R. 2021. Towards a Multidimensional Vulnerability Index. Available online at: UNDP. Available online at: <https://www.undp.org/publications/towards-multidimensional-vulnerability-index#modal-publication-download>

<sup>61</sup>IISD. 2019. High-Level Review Calls for Increased Support for SIDS' Disaster Management, Sustainable Development. Available online at: <https://sdg.iisd.org/news/high-level-review-calls-for-increased-support-for-sids-disaster-management-sustainable-development/>

Much of this work has been spearheaded by SIDS' advocacy. SIDS have been instrumental in drawing the attention of the international community to note their multiple vulnerabilities and resulting needs.<sup>62</sup> Development actors such as the World Bank, have created special funds and mechanisms to address SIDS' vulnerabilities, and the Global Environment Facility (GEF) has recently approved a window for SIDS financing under the Special Climate Change Fund (SCCF), which demonstrates a growing appreciation of multidimensional vulnerability. International consensus on an index to measure the specific vulnerabilities of SIDS has not yet been obtained.<sup>63</sup> It is recommended that this work is captured in the follow-up to the SAMOA Pathway.

### Key Message

GDP alone does not capture SIDS' vulnerabilities. Donors and donor agencies must consider the multi-dimensional vulnerability that SIDS face in concessional financing.

While many countries face similar challenges, such as less developed countries, or small states, what makes the SIDS unique is the **compounding of these vulnerabilities**—the vulnerability of small and dependent economies, small land masses and increasing environmental and climate threats. The fact that SIDS' domestic economies are highly interlinked means a shock in one sector can wreak havoc across the country at large. The proneness of SIDS to disasters means that SIDS are continuously rebuilding, often getting out of one disaster scenario when another strikes. This limits their resources to finance other sectors of society. This vulnerability has been exacerbated by the COVID-19 pandemic due to restricted travel, collapsing investment and tourism, and

weakening of global economies—thereby reducing remittances.<sup>64</sup>

This is also one of the reasons why this gap assessment is focusing on SIDS and not on islands at large. **While all islands share features, one key reason for distinguishing SIDS from other islands, is that access to means of implementation between SIDS and non-SIDS is significantly different.**

SIDS fall in their own category because they are independent states. Around one hundred sub-national island jurisdictions (SNIJs) exist (e.g., Bermuda or the Falklands). There are special components of larger states (e.g., Isle of Mann or American Samoa); or as island members of continental federated states (e.g. Hawaii or Tasmania).<sup>65</sup> These islands enjoy varying levels of autonomy and self-determination,<sup>66</sup> and to varying degrees, are tied to continental resources and institutions. SIDS are States unto themselves while islands linked to continental countries have differing institutional, geographic, and economic resources they can access. A large-scale hazard in SIDS may mean that most of the territory or its population is impacted, whereas islands that are federates of continental nations, may have resources, territory, and institutional structures outside of hazard-zones. SIDS, thus, require a different kind of targeting and vision in terms of development support.



Photo: UN Photo/Marco Dormino

<sup>62</sup>UN. 2022. High Level Panel on the Development of a Multidimensional Vulnerability Index: Interim Report. Available online at: [https://sdgs.un.org/sites/default/files/2022-08/MVI\\_Interim\\_Report\\_%20Final.pdf](https://sdgs.un.org/sites/default/files/2022-08/MVI_Interim_Report_%20Final.pdf)

<sup>63</sup>ISD. 2019. High-Level Review Calls for Increased Support for SIDS' Disaster Management, Sustainable Development. Available online at: <https://sdg.iisd.org/news/high-level-review-calls-for-increased-support-for-sids-disaster-management-sustainable-development/>

<sup>64</sup>UNDP. Assa, J. & Meddeb, R. 2021. Towards a Multidimensional Vulnerability Index. Available online at: UNDP. Available online at: <https://www.undp.org/publications/towards-multidimensional-vulnerability-index#modal-publication-download>

<sup>65</sup>Baldacchino, G. 2014. Small Island States; Vulnerable, Resilient, Doggedly Perseverant or Cleverly Opportunistic? In *Études Caribéennes*. Issue 27-28. Available online at: <https://journals.openedition.org/etudescaribeennes/6984>

<sup>66</sup>Ibid.

## 2.1.2 Proneness to, and High Costs of Disaster



Eight SIDS are among the ten countries most at risk from disasters, principally caused by extreme weather events (World Risk Report, 2020)

**SIDS account for two-thirds of the countries in the world that suffer the highest relative losses due to disasters caused by natural hazards, on an annual basis.**<sup>67</sup> On average, SIDS experience 2.1 % of GDP loss due to disasters, whereas other countries face an average of 0.3 % of GDP.<sup>68</sup> Caribbean SIDS experience the highest damage in terms of their GDP due to disasters--between 1970 and 2018 disasters caused, on average, an annual damage of equivalently 2.8 % of GDP.<sup>69</sup> As noted previously, while GDP losses do not capture the full extent of social, environmental and human costs of disasters,<sup>70</sup> they do provide a window into economic losses that have to be borne, managed and accounted for. The AIS states are not shielded from these risks either; over the last 55 years, Comoros, Mauritius and Seychelles have been affected by more than 100 disasters, 94 of them related to hydrometeorological hazard.<sup>71</sup> As noted by the Organisation for Economic Cooperation and Development (OECD), even islands that manage

to achieve high income levels, “remain one exogenous shock away from a development crisis with long-lasting effects due to their size, remoteness and natural vulnerabilities”.<sup>72</sup>

The **impacts of disasters are disproportionately large in SIDS**, compared to other countries. Between 2000 and 2015, SIDS, along with low-income countries had the largest share of their populations affected by disasters.<sup>73</sup> SIDS face elevated risks for disaster incidence, particularly due to natural hazards such as tropical cyclones, earthquakes, tsunamis, volcanoes, and from marine hazardous materials spills.<sup>74</sup>

Disasters, including the loss of life, infrastructure and livelihoods, are an incredibly high economic cost for SIDS to bear. In larger states, damages from hazards can be more localized and represent a relatively smaller share of the economy. In SIDS, hazards present a systemic risk, as the bulk of territory can be impacted at the same time, and hazards can negatively impact several systems at once.<sup>75</sup> As is noted in the 2022 Global Assessment Report on Disaster Risk Reduction, the concept of systemic risk is based on the notion that the adverse outcome of a hazard event can depend on how the elements of the affected systems interact with each other, which can aggravate or reduce the overall effect of the constituent parts.<sup>76</sup> One can assume that in small SIDS, with interdependent systems, there is the potential for negative systemic risks cascading across sectors. For instance,

<sup>67</sup>OECD/World Bank/GFDRR. 2016. Climate and Disaster Financing in Small Island Developing States. Available online at: <https://reliefweb.int/report/world/climate-and-disaster-resilience-financing-small-island-developing-states>

<sup>68</sup>UNCTAD. 2020. Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No. 55. Available online at: <https://unctad.org/webflyer/multiple-disasters-and-debt-sustainability-small-island-developing-states>

<sup>69</sup>Ibid.

<sup>70</sup>UNEP. 2014. Emerging issues for Small Island Developing States. Results of the UNEP Foresight Process. United Nations Environment Programme (UNEP), Nairobi, Kenya.

<sup>71</sup>CREWS. 2017. “Supporting regional cooperation to strengthen seamless operational forecasting and multi hazard early warning systems at national level in the South-West Indian Ocean”: Project Presentation Note. Available online at: [https://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocreus/s3fs-public/ckeditor/files/South-West\\_Indian\\_Ocean\\_-\\_CREW\\_S\\_Proposal\\_L3-final.pdf?OS7oFXrCT0Mp4\\_qGDppxuSFu3uCFReBB](https://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocreus/s3fs-public/ckeditor/files/South-West_Indian_Ocean_-_CREW_S_Proposal_L3-final.pdf?OS7oFXrCT0Mp4_qGDppxuSFu3uCFReBB)

<sup>72</sup>OECD. 2018. Making Development Co-Operation Work for Small Island Developing States. Available online at: <https://www.oecd.org/dac/making-development-co-operation-work-for-small-island-developing-states-9789264287648-en.htm>

<sup>73</sup>OECD/World Bank/GFDRR. 2016. Climate and Disaster Financing in Small Island Developing States. Available online at: <https://reliefweb.int/report/world/climate-and-disaster-resilience-financing-small-island-developing-states>

<sup>74</sup>Shultz, J.M., Cohen, M.A., Hermosilla, S., Espinel, Z., McLean, A. 2016. Disaster risk reduction and sustainable development for small island developing states. *Disaster Health*; 3(1)

<sup>75</sup>Cebotari and Youssef, 2020, quoted in Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No. 55, 2020. Available online at: <https://unctad.org/webflyer/multiple-disasters-and-debt-sustainability-small-island-developing-states>

<sup>76</sup>UNDRR. 2022. Global Assessment Report on Disaster Risk Reduction: Our World at Risk: Transforming Governance for a Resilient Future. Available online: <https://www.undrr.org/gar2022-our-world-risk#container-downloads>

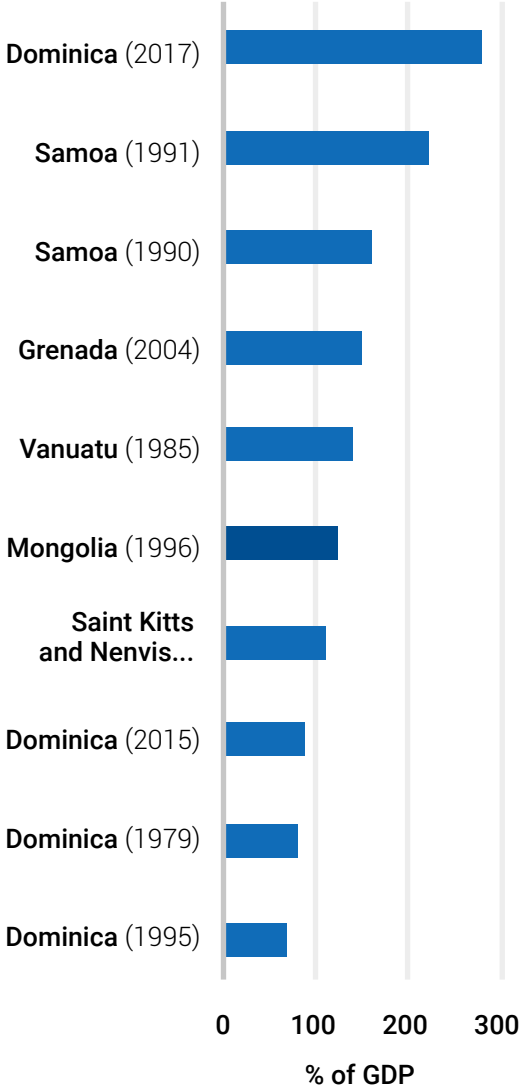
many SIDS' food systems are highly dependent upon imports—natural hazards could have the impact of disrupting trade leading to risk beyond food systems.<sup>77</sup> Disasters can affect almost all industries and sectors at once in SIDS. In Tuvalu, for instance, Tropical Cyclone Tino caused damage to assets and equipment for fishing and agriculture, power supply and storage, telephone services, healthcare, water, road and water transport, and residences. There was also significant loss of vegetation, coastal erosion and debris affecting nearly all sectors.<sup>78</sup> Further, the COVID-19 pandemic and climate change both demonstrate growing systemic risks that will have cascading effects across countries and economies,<sup>79</sup> and will be experienced acutely in smaller territories.

It also appears as though this proneness to disaster is increasing. Prior to the 2000s, SIDS suffered from fewer than ten major disasters annually. With the increasing frequency and intensity of hazards, over the last two decades, SIDS have suffered through 20 major disasters.<sup>80</sup>

Recurring hazards further compound the socio-economic vulnerabilities of countries. Many countries have barely recovered from one hazard, when another one hits, stressing public resources and facilities. In Saint Lucia, Hurricane Dean in 2007 caused up to 63.4 % of GDP losses in the agriculture sector. Shortly thereafter, in 2010, Hurricane Tomas caused losses of up to 43.4 % of GDP.<sup>81</sup> The United Nations Conference on Trade and Development (UNCTAD) estimates that on average 2 % of the GDP in Saint Lucia is lost every year due to extreme natural hazards.<sup>82</sup>

When examining the ten most severe disasters around the world caused by natural hazards, in terms of damage to GDP, from the period of 1970 to 2018, all but one occurred in the SIDS.<sup>83</sup>

**Fig. 1. Most Severe Climate-Related Disaster Years by Damage as Percent of GDP.**



Source: UNCTAD (2020)

<sup>78</sup>Government of Tuvalu. Strategic Roadmap for Emergency Management 2021-2023. Available online at: [https://spccfpstore1.blob.core.windows.net/digitalibrary-docs/files/22/224d1edea2f6f6e556afeb16209018c8.pdf?sv=2015-12-11&sr=b&sig=zUTu%2FDt%2FhxJyTbCOltM3%2FRUwqipNruOLQfZ4OUUsBte0%3D&se=2023-01-31T17%3A23%3A18Z&sp=r&rscd=public%2C%20max-age%3D864000%2C%20max-stale%3D86400&rsct=application%2Fpdf&rscd=inline%3B%20filename%3D%22Tuvalu\\_SREM\\_Final\\_2021\\_full\\_version.pdf%22](https://spccfpstore1.blob.core.windows.net/digitalibrary-docs/files/22/224d1edea2f6f6e556afeb16209018c8.pdf?sv=2015-12-11&sr=b&sig=zUTu%2FDt%2FhxJyTbCOltM3%2FRUwqipNruOLQfZ4OUUsBte0%3D&se=2023-01-31T17%3A23%3A18Z&sp=r&rscd=public%2C%20max-age%3D864000%2C%20max-stale%3D86400&rsct=application%2Fpdf&rscd=inline%3B%20filename%3D%22Tuvalu_SREM_Final_2021_full_version.pdf%22)

<sup>79</sup>UN DESA. 2021. Risk Informed Finance. Policy Brief n# 98. Available online at: <https://www.un.org/development/desa/dpad/publication/un-desa-policy-brief-98-risk-informed-finance/>

<sup>80</sup>UNCTAD. 2022. Climate Finance for SIDS is Shockingly Low: Why This Needs to Change. Available online at: <https://unctad.org/news/climate-finance-sids-shockingly-low-why-needs-change>

<sup>81</sup>WEF/EU/DANIDA. 2021. Country Financing for the SDGs: Saint Lucia, Insight Report. Available online at: [https://www3.weforum.org/docs/WEF\\_Country\\_Financing\\_Roadmap\\_for\\_the\\_SDGs\\_Saint\\_Lucia\\_2021.pdf](https://www3.weforum.org/docs/WEF_Country_Financing_Roadmap_for_the_SDGs_Saint_Lucia_2021.pdf)

<sup>82</sup>WEF. 2021. Country Financing Roadmap for the SDGs: Saint Lucia; Insight Report. Available online at: [https://www3.weforum.org/docs/WEF\\_Country\\_Financing\\_Roadmap\\_for\\_the\\_SDGs\\_Saint\\_Lucia\\_2021.pdf](https://www3.weforum.org/docs/WEF_Country_Financing_Roadmap_for_the_SDGs_Saint_Lucia_2021.pdf)

<sup>83</sup>UNCTAD. 2020. Slany, A. Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No 55. Available online at: [https://unctad.org/system/files/official-document/ser-rp-2020d14\\_en.pdf](https://unctad.org/system/files/official-document/ser-rp-2020d14_en.pdf)

## Climate Change

Climate change presents unique challenges to SIDS. One significant challenge is sea-level rise, which could lead to flooding, salinization, permanent inundation, pressures on agricultural production and ecosystem health erosion.<sup>84</sup> In Comoros, it is estimated that flooding will cost the country an estimated USD 2 million each year from direct losses.<sup>85</sup> 87 % of those losses are from the residential sector, creating great strains on the local citizenry and the public purse that needs to support recovery.<sup>86</sup>

Climate change is predicted to increase the frequency and intensity of cyclones and hurricanes in the Pacific and the Caribbean. Research indicates that 10 to 20 cm of sea-level rise by 2050 will "more than double the frequency of extreme water-level events in the tropics, impairing the developing economies of equatorial coastal cities and the habitability of low-lying Pacific Island nations."<sup>87</sup> In the case of Maldives, 80 % of the country lies just one meter or less above sea level. Under the IPCC's best-case projection – of an average sea level rise of 0.43m by 2100 – 77 % cent of the country's land area is at risk of being submerged by the end of the century.<sup>88</sup> In some cases, some SIDS may even become uninhabitable.<sup>89</sup>

Hazards associated with the ocean and cryosphere other than sea-level rise also includes tropical cyclones, land erosion,

increased storm severity, ocean acidification, coral bleaching, habitat loss, climate induced illnesses and marine heatwaves.<sup>90</sup> SIDS have large ocean territories meaning that significant marine resources, fisheries, and biodiversity are highly exposed to climate change.<sup>91</sup> SIDS are also particularly vulnerable as a large proportion of their population, assets and infrastructure are located in coastal zones.<sup>92</sup> Impacts on population and infrastructure include loss of lives, homes and livelihoods, food shortages and water insecurity, spread of illnesses, displacement, negative economic impacts, and disruption to key infrastructure such as transportation and communication.<sup>93</sup>

Climate-related disasters have widespread and lasting socioeconomic, health and environmental impacts in SIDS. Hurricane Maria in 2017, for instance, caused damages in Dominica totalling over 225 % of the country's GDP, and displaced the entire population of Barbuda.<sup>94</sup> Similarly, in the Pacific, Cyclone Winston in 2016 impacted over 60 % of the population in Fiji, with 22 % of the nation's housing either destroyed or damaged and over 130,000 people being displaced. Cyclone Pam, in 2015, affected over 70 % of the population in Vanuatu, displaced 65,000 people, and damaged 17,000 buildings. The estimated economic cost of Cyclone Pam on Vanuatu across all sectors was approximately 64 % of the country's GDP.<sup>95</sup>

---

<sup>84</sup>IPCC. 2018. Summary for Policymakers in Special Report: Global Warming of 1.5 C. Available online at: <https://www.ipcc.ch/sr15/>

<sup>85</sup>GFDRR. 2016. Comoros: Disaster Risk Profile. Available online at: <https://www.gfdr.org/sites/default/files/comoros.pdf>

<sup>86</sup>Ibid.

<sup>87</sup>Vitousek, S., Barnard, P., Fletcher, C. et al. Doubling of coastal flooding frequency within decades due to sea-level rise. *Sci Rep* 7, 1399 (2017). Available online at: <https://doi.org/10.1038/s41598-017-01362-7>

<sup>88</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at: [https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>89</sup>UNFCCC. Climate Change: Small Island Developing States. Available online at: [https://unfccc.int/resource/docs/publications/cc\\_sids.pdf](https://unfccc.int/resource/docs/publications/cc_sids.pdf)

<sup>90</sup>GIZ. 2021. Climate Risk Management in Coastal LDCs and SIDS. Available online at: <https://reliefweb.int/report/world/climate-risk-management-coastal-ldcs-and-sids-assessment-adaptation-potentials-climada>

<sup>91</sup>UNDP. Lopez-Calva, L. 2018. Finance, Partnerships and Innovation: Large Ocean States Pave the Way to the 2030 Agenda. Available online at: <https://www.undp.org/blog/finance-partnerships-and-innovation-large-ocean-states-pave-way-2030-agenda>

<sup>92</sup>GIZ. 2021. Climate Risk Management in Coastal LDCs and SIDS. Available online at: <https://reliefweb.int/report/world/climate-risk-management-coastal-ldcs-and-sids-assessment-adaptation-potentials-climada>

<sup>93</sup>Thomas, A., Baptiste, A., Martyr-Koller, R., Pringle, P., Rhoney, K. 2020. Climate change and Small Island Developing States. *Annual Review of Environment and Resources*, 45(6). Available online at: <https://www.annualreviews.org/doi/10.1146/annurev-environ-012320-083355>

<sup>94</sup>UNDP. Lopez-Calva, L. 2018. Finance, Partnerships and Innovation: Large Ocean States Pave the Way to the 2030 Agenda. Available online at: <https://www.undp.org/blog/finance-partnerships-and-innovation-large-ocean-states-pave-way-2030-agenda>

<sup>95</sup>Hare, B., Schleussner, C.F., Serdeczny, O., Saeed, F., Thomas, A., Zamarioli, L. 2017. A Year of Climate Extremes: A Case for Loss and Damage at Cop 23. Available online at: <https://climateanalytics.org/blog/2017/a-year-of-climate-extremes-a-case-for-loss-damage-at-cop23/#fn4889688486169db910c28e-1>

## Non-Weather Hazards

In addition to weather hazards, geological hazards such as earthquakes, landslides and volcanic activities have historically had devastating impacts on SIDS. The 2010 earthquake in Haiti led to the death of 220,000 people, injury of 300,000, and the homelessness of 1.5 million people.<sup>96</sup> In St. Vincent and the Grenadines, the eruption of the La Soufrière volcano and COVID-19 has led to the most destructive economic shock the country has experienced in a hundred years, as well as the devastation of agricultural lands in the northeast of the country.<sup>97</sup> This occurred in tandem with one of the worst droughts the country had experienced in 50 years, exacerbating the food, water and energy pressures on the local population.<sup>98</sup>

Due to their maritime environment, SIDS are highly susceptible to anthropogenic hazards. In the West Indian Ocean, it is estimated that 700 million tons of raw petroleum products are transported annually in Comoros waters. Given the frequency and size of ships that carry these products, risk of oil spills and pollution of coastal areas is very high.<sup>99</sup> This can have health, economic, food security and social implications. This was witnessed in the Solomon Islands in 2019, when an oil spill near Renell Island left several coastal villages without the ability to fish,

severely impacting food security. Natural springs had been contaminated thereby threatening access to safe-drinking water. Communities were unable to use beaches, coral reefs were destroyed and some of the population experienced burns when in contact with the oil spill.<sup>100</sup>

SIDS have historically also suffered impacts of biological disasters. The deadliest biological disaster was in 1978 in the Maldives, where 0.14 % of the population perished, and in 1986 in São Tomé and Príncipe where 0.15 % of the population suffered from the loss of life. Of the world's ten deadliest biological disasters, five have been in SIDS: Maldives, São Tomé & Príncipe, Guinea-Bissau, Haiti, and Cabo Verde.<sup>101</sup>

Such disasters make it more challenging for SIDS to allocate resources and finances to more long-term resilience and ex-ante interventions, as disasters require immediate responses and action. Crisis situations can also fuel increased demands for natural resources, degradation of ecosystems, erosion of natural buffers, as people seek shelter, sustenance and quick livelihoods to compensate for loss. This was manifested in Haiti, in the aftermath of Hurricane Matthew, where isolated communities in the Parc Macaya protected area, resorted to degrading practices for survival.<sup>102</sup>

<sup>96</sup>UN. 2022. UN Marks Anniversary of Devastating 2010 Haiti Earthquake in UN News. Available online at: <https://news.un.org/en/story/2022/01/1109632#:~:text=On%2012%20January%202010%2C%20a,%2C%20known%20as%20MINUSTAH%2C%20collapsed.>

<sup>97</sup>LACCOM. 2022. St. Vincent and the Grenadines. Available online at: <https://lacom.georgetown.domains/saint-vincent-and-the-grenadines/>

<sup>98</sup>Trotman, A., Mahon, R., Van Meerbeeck, C., Riley, J.E., et al. Advancing Drought Risk Management in the Caribbean: A Multi-Sectoral Perspective. Available online at: [https://www.preventionweb.net/files/78462\\_cs5.gar21caribbeandroughtcasestudyf.pdf](https://www.preventionweb.net/files/78462_cs5.gar21caribbeandroughtcasestudyf.pdf)[https://www.preventionweb.net/files/78462\\_cs5.gar21caribbeandroughtcasestudyf.pdf](https://www.preventionweb.net/files/78462_cs5.gar21caribbeandroughtcasestudyf.pdf)

<sup>99</sup>UNEP/OCHA/UNDP. 2013. Environmental Emergencies Comoros: Report of Scoping Mission. Available online at: <http://www.eccentre.org/wp-content/uploads/2019/06/Report-EE-Mission-Comoros-FINAL-2013.pdf>

<sup>100</sup>Osifelo, E. & Martin, L. 2019. Solomon Islands Struggle with Nation's Worst Oil Spill in The Guardian. Available online at: <https://www.theguardian.com/environment/2019/mar/06/solomon-islanders-suffer-worst-oil-spill-nations-history-bulk-carrier-bauxite>

<sup>101</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at: [https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>102</sup>UNEP. 2018. Macaya Grand Sud-Phase II Project Document.

Photo: Flickr/UN DRR Gallery





### 2.1.3 Economic Consequences

The costs associated with lowering risk and responding to disasters can be economically onerous for SIDS. In the Caribbean a single hurricane can wipe out an island's annual GDP.<sup>103</sup> SIDS' losses cannot be compared to continental countries. For even though continental country disasters may amount to higher costs due to the loss of valuable assets, SIDS have the largest losses as a percentage of national output.<sup>104</sup> Time of recovery and rehabilitation from a disaster also has an economic cost.

SIDS are among the most trade-dependent economies and are largely reliant on other countries for their food security, for integral inputs, and for technical and productive capacity.<sup>105</sup> Any disaster-based trade disruption could subject populations to food insecurity or to the crashing of productive sectors. The World Bank notes that in the Caribbean region, 80-90 % of all food comes from abroad, with only three countries, Belize, Haiti, and Guyana producing 50 % of their own food.<sup>106</sup> SIDS' stronger dependence on the global economy, is manifested through tourism, remittances, financial services, and concessional financing. In 2020, due to the COVID-19 pandemic, SIDS were expected to experience a 9.8 % decrease in GDP, compared to a drop of 2.2 % in other developing countries.<sup>107</sup>

A significant factor in the economic vulnerability of SIDS is dependence on capital inflows and

trade. In most SIDS, official development assistance (ODA) and remittances represent a larger share of GDP than the average in other developing countries and LDCs.<sup>108</sup> Reliance on foreign direct investment (FDI) flows is more varied, with SIDS in the Pacific attracting little FDI, relative to those in Africa and the Caribbean.<sup>109</sup>

There are often calls to increase private-sector investment and partnership in DRR activities. However, it is noted by SIDS that their private sector tends to be small.<sup>110</sup> Some private sector entities in SIDS may be foreign-owned with less alignment with national priorities. SIDS' small size also prevents them adopting large-scale economic development strategies based on very limited factors of production.<sup>111</sup>

### Tourism

Tourism is a mainstay of SIDS economies; SIDS attracted approximately 21 million tourists in 2018.<sup>112</sup> The most popular SIDS' destination pre-COVID 19, were the Bahamas with 6.6 million tourists, and Jamaica with 3 million tourists (2018 figures). Other popular SIDS destinations include: Antigua and Barbuda, Barbados, Fiji, Mauritius, Saint Kitts and Nevis and Saint Lucia.<sup>113</sup>

Prior to the COVID-19 pandemic, tourism was one of the fastest growing economic sectors in SIDS.<sup>114</sup>

---

<sup>103</sup>OECS. 2021. The Dual Assault of the Pandemic and Volcano Eruption Has Sparked the Need for Greater Caribbean Integration. Available online at:

<https://reliefweb.int/report/world/dual-assault-pandemic-and-volcano-eruption-has-sparked-need-deeper-caribbean-regional>

<sup>104</sup>OECD. 2022. Small Island Developing States-SIDS. Available online at:

<https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/small-island-developing-states.htm>

<sup>105</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at:

[https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>106</sup>World Bank. 2020. Future Foodscapes: Re-Imagining Agriculture in Latin America and the Caribbean. Available online at:

<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/942381591906970569/future-foodscapes-re-imagining-agriculture-in-latin-america-and-the-caribbean>

<sup>107</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at:

[https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>108</sup>McGillivray, M., Naudé, W., & Santos-Paulino, A. U. 2010. Vulnerability, Trade, Financial Flows and State Failure in Small Island Developing States. *The Journal of Development Studies*, 46(5), 815-827.

<sup>109</sup>Ibid.

<sup>110</sup>Pacific Workshop. 2021.

<sup>111</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at:

[https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>112</sup>Ibid.

<sup>113</sup>Ibid.

<sup>114</sup>Ibid.

Disasters negatively impact tourist flows. This was manifested in the Caribbean with the eruption of the La Soufriere volcano in St. Vincent and the Grenadines in 2020, which not only impact the country, but the release of the ash affected nearby islands. In Barbados, the air quality was severely impacted, tourists were told to stay indoors, and the airport had to be shut down due to ashfall.<sup>115</sup>

At present, two key issues that will affect tourism in SIDS include the impacts of the COVID-19 pandemic, and the progressive effect of climate change<sup>116</sup>—both of which can exacerbate vulnerability and exposure if disaster risk is not managed through appropriate policy responses supported by the global community.

### High Levels of Debt and Post-Crisis Financing

SIDS struggle with exceedingly high debt-to-GDP ratios, which affects their ability to compensate for disasters.<sup>117</sup> Over the past decade the overall external debt stocks in SIDS have increased by 7 % on average per year, over 2011-19, reaching USD 96 billion in 2019.<sup>118</sup> In 2021, it was noted by the World Bank and IMF Debt Sustainability Analysis, that 15 out of 20 SIDS rated were either in debt distress or at a high risk of debt distress, while another 4 were moderately in distress.<sup>119</sup> Countries such as Jamaica, Mauritius and Papua New Guinea, have the highest debt servicing-over-export ratios.<sup>120</sup>

As noted in the section on proneness to disaster, reconstruction efforts require significant financial resources, which are often financed through external borrowing. SIDS are highly

exposed to economic shocks, resulting in dramatic decreases in GDP and exports during global crises such as the pandemic.<sup>121</sup> This poses threats to future investments, to the financing of risk reduction strategies and sustainable development actions. It also threatens SIDS' capacities to withstand compounding crises. Further, debt servicing capacity weakens if a disaster impacts productive sectors.<sup>122</sup>

In Saint Lucia, for instance, there is an increasing cycle of increased borrowing and repayments due largely to disasters. The government has had to borrow funds to rebuild following disasters and the country's debt-to-GDP ratio has been increasing. This also has the added consequence of limiting any fiscal availability for weathering other challenges, such as the COVID-19 pandemic.<sup>123</sup>

An emerging challenge is that SIDS' vulnerability to climate change is now being considered in their credit ratings.<sup>124</sup> This may reduce countries' abilities to access loans and attract foreign investment and financing.



Photo: UN Photo/Logan Abassi

<sup>115</sup>OECS. 2021. The Dual Assault of the Pandemic and Volcano Eruption Has Sparked the Need for Greater Caribbean Integration. Available online at: <https://reliefweb.int/report/world/dual-assault-pandemic-and-volcano-eruption-has-sparked-need-deeper-caribbean-regional>

<sup>116</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at: [https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>117</sup>UNDP. Meddeb, R. Small Island Developing States do not Have the Luxury of Time. Available online at: <https://www.undp.org/blog/small-island-developing-states-do-not-have-luxury-time>

<sup>118</sup>OECD. 2021. The Impact of the COVID-19 Crisis on External Debt in Small Island Developing States. Available online at: [https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states\(SIDS\).pdf](https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states(SIDS).pdf)

<sup>119</sup>UN-OHRLS. 2021. Financing for Development in Small Island Developing States. Available online at: [https://www.un.org/ohrls/sites/www.un.org.ohrls/files/financing\\_for\\_development\\_for\\_sids\\_report\\_advance\\_unedited.pdf](https://www.un.org/ohrls/sites/www.un.org.ohrls/files/financing_for_development_for_sids_report_advance_unedited.pdf)

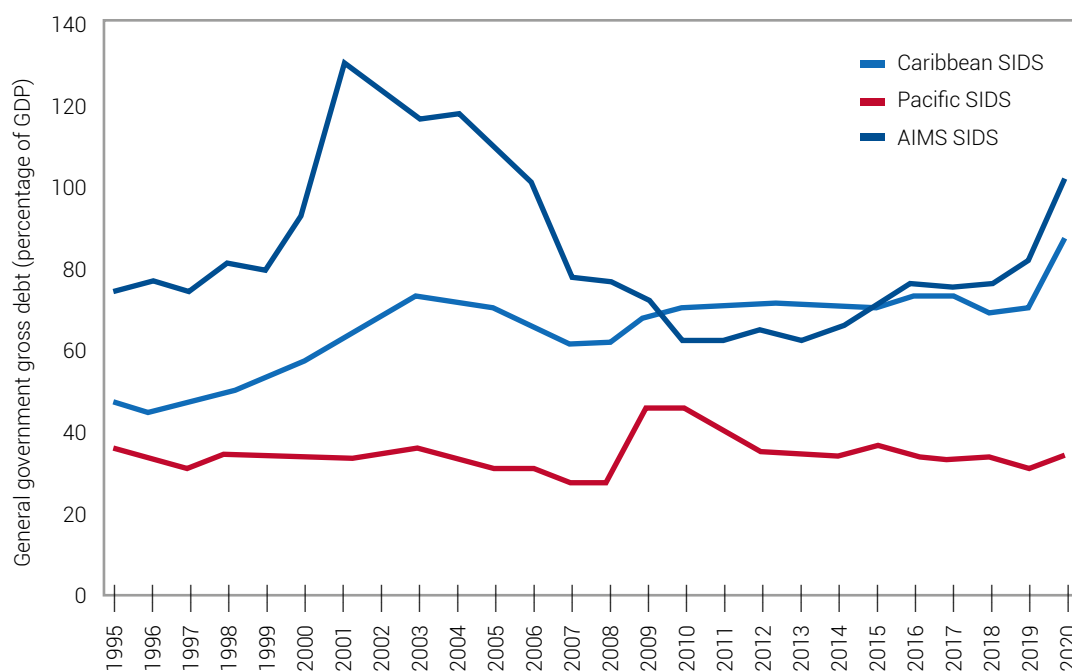
<sup>120</sup>OECD. 2021. The Impact of the COVID-19 Crisis on External Debt in Small Island Developing States. Available online at: [https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states\(SIDS\).pdf](https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states(SIDS).pdf)

<sup>121</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at: [https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>122</sup>Ibid.

<sup>123</sup>WEF/EU/DANIDA. 2021. Country Financing for the SDGs: Saint Lucia, Insight Report. Available online at: [https://www3.weforum.org/docs/WEF\\_Country\\_Financing\\_Roadmap\\_for\\_the\\_SDGs\\_Saint\\_Lucia\\_2021.pdf](https://www3.weforum.org/docs/WEF_Country_Financing_Roadmap_for_the_SDGs_Saint_Lucia_2021.pdf)

<sup>124</sup>IPCC. 2021. Small Islands in IPCC WGII Sixth Assessment Report. Available online at: [https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC\\_AR6\\_WGII\\_FinalDraft\\_Chapter15.pdf](https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_Chapter15.pdf)



Source: Thomas, A., Theokritoff, E. Debt-for-climate swaps for small islands. Nat. Clim. Chang. 11, 889–891 (2021) using data from World Economic Outlook Database (IMF)

Ongoing crises also pose challenges to future post-crisis financing. The costs of multiple disasters challenges donor countries to leverage ongoing resources for reconstruction and development activities.<sup>125</sup>

SIDS also face significant challenges in mobilizing domestic resources and accessing capital markets,<sup>126</sup> limiting resources for sustainable development. They tend to have small and erratic domestic revenues, which pose challenges given the high costs in providing public services and the fiscal impacts of disasters.<sup>127</sup>

International partners have supported SIDS to access resources to address liquidity problems. The International Monetary Fund (IMF), for instance, has eased access to rapid financing. By December 2020, 15 SIDS had benefitted from this mechanism for a total of USD 1.9 billion to

withstand the challenges posed by the pandemic.<sup>128</sup> However, given the diverse sources of debt, the funds do not appear sufficient to respond to SIDS' needs.<sup>129</sup>

### Key Message

Debt reduction and restructuring should be integrated into DRR support to SIDS given their high levels of indebtedness.



<sup>125</sup>UNCTAD. Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No. 55, 2020 Available online at: <https://unctad.org/webflyer/multiple-disasters-and-debt-sustainability-small-island-developing-states>

<sup>126</sup>OECD. 2018. Making Development Co-Operation Work for Small Island Developing States. OECD Publishing, Paris. Available online at: <https://www.oecd.org/dac/making-development-co-operation-work-for-small-island-developing-states-9789264287648-en.htm>

<sup>127</sup>Ibid.

<sup>128</sup>OECD. 2021. The Impact of the COVID-19 Crisis on External Debt in Small Island Developing States. Available online at: [https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states\(SIDS\).pdf](https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states(SIDS).pdf)

<sup>129</sup>Ibid.

## 2.1.4 Impacts of COVID-19

SIDS are among the most impacted countries by the economic crisis caused by the COVID-19 pandemic,<sup>130</sup> and their economies are anticipated to contract more so than developing countries.<sup>131</sup> With decreasing tourism, languid supply chains, rising inflation and the cost of petrol, SIDS have suffered on a variety of socio-economic fronts.

The drop in tourism and lower demand for exports, has revealed the vulnerability and volatility of SIDS economies. According to UNCTAD estimates, a decline in tourism by 25 % will result in a fall of GDP by 7.3 % in SIDS.<sup>132</sup> The OECD notes that tourism-dependent SIDS are anticipated to suffer severe GDP contractions: “in Antigua and Barbuda, Belize, Fiji, Maldives and Saint Lucia, GDP is expected to shrink by 16% or more, making the current crisis the worst in recorded history. For fisheries-dependent SIDS – such as Comoros, Kiribati, Marshall Islands, Micronesia and Tuvalu – expect GDP drops range between 0.5 % (Tuvalu) and 4.5 % (Marshall Islands).”<sup>133</sup> Economic challenges in SIDS will likely be exacerbated by the overdependence on few economic sectors, high fiscal deficits and public debt levels, as well as constraints in mobilising public and private finance.<sup>134</sup>

In addition to falling tourism revenues, remittances are anticipated to decline, as pandemic-related economic challenges, such as inflation and recessions are experienced around the world. There is the threat that there may be solvency issues as net interest payments exceed current account inflows.<sup>135</sup> With burgeoning external debt, any added exposure to hazards

could have dire consequences. Due to their lack of buffers to absorb shocks, any disaster, poor harvest, or closure of a major industry could devastate SIDS' economies.<sup>136</sup>



### Key Message

As countries “build back better” in the wake of the COVID-19 pandemic, recovery must be risk-informed in all sectors

## 2.1.5 Leaders in Sustainable Development

SIDS have been leaders in identifying threats and drawing international attention to issues of global concern. SIDS were among the first countries to raise the alarm and profile on climate change due to their observations and levels of exposure.<sup>137</sup> Despite their small size and remoteness, together they represent a larger population, specialized sets of skills and talents, and can point to gaps and opportunities to prevent the creation of new, reduce existing, and manage residual risk to build resilience that can otherwise go underrepresented. They represent approximately one-third of all developing countries and close to a quarter of the membership of the United Nations.<sup>138</sup> As a collective, SIDS can yield greater influence in international fora and can mobilize more efficient, responsive, and strategic disaster risk reduction.

<sup>130</sup>OECD. 2021. The Impact of the COVID-19 Crisis on External Debt in Small Island Developing States. Available online at: [https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states\(SIDS\).pdf](https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states(SIDS).pdf)

<sup>131</sup>IMF. 2020. World Economic Outlook Database. Available online at: <https://www.oecd.org/coronavirus/policy-responses/covid-19-pandemic-towards-a-blue-recovery-in-small-island-developing-states-241271b7/#section-d1e309>

<sup>132</sup>UNCTAD. 2020. Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No. 55. Available online at: <https://unctad.org/webflyer/multiple-disasters-and-debt-sustainability-small-island-developing-states>

<sup>133</sup>OECD. 2021. COVID-19 Pandemic: Towards a Blue Recovery in Small Island Developing States. Available online at: <https://www.oecd.org/coronavirus/policy-responses/covid-19-pandemic-towards-a-blue-recovery-in-small-island-developing-states-241271b7/>

<sup>134</sup>Ibid.

<sup>135</sup>UNCTAD. 2020. Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No. 55. Available online at: <https://unctad.org/webflyer/multiple-disasters-and-debt-sustainability-small-island-developing-states>

<sup>136</sup>Baldacchino, G. Small Island States; Vulnerable, Resilient, Doggedly Perseverant or Cleverly Opportunistic? 2014. In *Etudes Caribéennes*. Issue 27-28

<sup>137</sup>IISD. Mead, L. Small Islands, Large Oceans: Voices on the Frontlines of Climate Change. Available online at: <https://www.iisd.org/system/files/2021-03/still-one-earth-SIDS.pdf>

<sup>138</sup>AOSIS. 2021. The Small Islands Climate Plan: SIDS Package. Available online at: <https://www.aosis.org/the-small-islands-climate-plan-sids-package/>

Given SIDS' small size, they also offer unique insights as a space where policy decisions and DRR activities can be ameliorated and tested. This offers insights not just for SIDS, but for continental countries, particularly with coastal communities. SIDS are microcosms of continental counterparts where strategies, policies and management regimes for sustainable development can be applied, verified, refined, and where cause and effect are more readily observable and felt, outcomes more rapidly seen and results more measurable.<sup>139</sup>

SIDS are also relevant historically, culturally, and ecologically. They house some of the most unique biodiversity of global interest and relevance. Destruction of SIDS' endowments is a loss of global proportions.

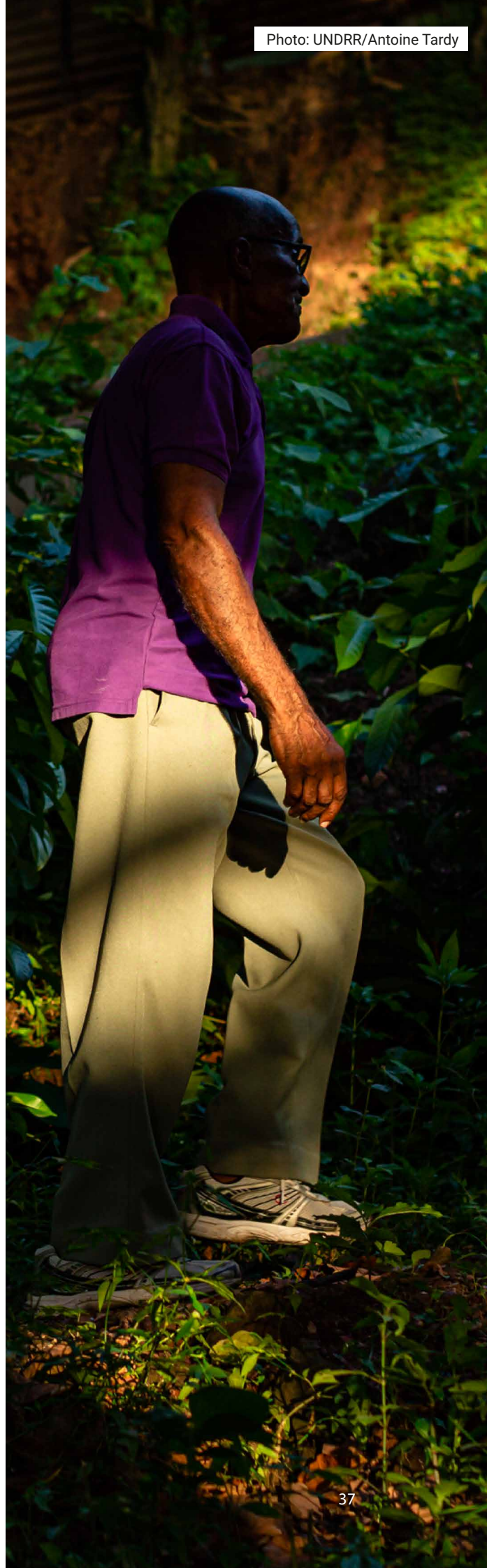
Finally, one would be remiss not to recognize the economic clout that SIDS have as a group, as they manage vast ocean resources<sup>140</sup> Through exclusive economic zones (EEZs), they manage about 30 % of all oceans and seas. They have around 24,111 km<sup>2</sup> in total land area and 666,110 km<sup>2</sup> in EEZs, through which they can leverage great economic influence. SIDS are increasingly leading on the international sustainable ocean agenda,<sup>141</sup>-- a role complementary to one they can play on the DRR platform.

---

<sup>139</sup>Nevill, J. Eco-Tourism as a Source of Funding to Control Invasive Alien Species: The Case of Seychelles in International Journal of Island Affairs. Available online at: <https://www.cbd.int/doc/ref/island/insula-ecotour-en.pdf>

<sup>140</sup>IISD. 2021. Mead, L, Small Islands: Large Oceans: Voices on the Frontlines of Climate Change. Available online at: <https://www.iisd.org/system/files/2021-03/still-one-earth-SIDS.pdf>

<sup>141</sup>OECD. 2021. COVID-19 Pandemic: Towards a Blue Recovery in Small Island Developing States. Available online at: [https://www.oecd.org/coronavirus/policy-responses/covid-19-pandemic-towards-a-blue-recovery-in-small-island-dev-losing-states-241271b7/](https://www.oecd.org/coronavirus/policy-responses/covid-19-pandemic-towards-a-blue-recovery-in-small-island-developing-states-241271b7/)



# PART 3: MEANS OF IMPLEMENTATION

---

Photo: Kartik Chandramouli/Mongabay



The means of implementation to achieve DRR targets are as strategic as the framework. The MOI are the drivers for the change and transformation necessary to achieve desired Goal and Targets of the Sendai Framework. The next sub-sections will examine the gaps, challenges, constraints and successes in means of implementing DRR targets as per MOI identified.

The means of implementation examined in this section are derived from the Sendai Framework and the SAMOA Pathway, which include access to: (i) financial resources; (ii) capacity; (iii) data & technology; (iv) partnerships and platforms of cooperation. This is also in line with the means of implementation identified in the High-Level Political Declaration on the Midterm Review of the SAMOA Pathway, which identifies the need to create an enabling environment “to facilitate and attract foreign direct investment and financing, and capacity support for small island developing States”; as well as the need to strengthen cooperation, capacity and investment in disaster risk management.<sup>142</sup>

### 3. Financial Resources

SIDS make up two-thirds of countries with the highest annual losses due to disasters.<sup>143</sup> Disasters and their associated costs have increased over the past 40 years,<sup>144</sup> and climate change will increase disaster risk by altering the frequency and intensity of hazard events, changing exposure patterns and increasing populations' vulnerabilities.<sup>145</sup> SIDS' dependence on external financial resources is also far more acute now, given the decrease in tourism revenues due to the COVID-19 pandemic.<sup>146</sup>

There are various instruments available for SIDS

to manage the costs of disasters. These include (i) self-insurance; (ii) risk-transfer to the insurance market, such as catastrophe bonds; (iii) prearranged loans from financial institutions and central banks; and (iv) fiscal spending and borrowing.<sup>147</sup> While these instruments exist, post-disaster financing is largely sought through various grants and official borrowing. However, these can be challenging to mobilize due to complex grant architecture, ongoing strains on donor countries, lack of liquid assets, delays in funding, and lack of funding on the ex-ante initiatives.

The main challenge that remains is that **financing does not match the scale of existing and future disaster risks**, and most disaster funding is allocated to recovery response, rather than to disaster reduction or prevention.<sup>148</sup> Funding for recovery is often insufficient to meet post-disaster needs. According to the United Nations Office for Disaster Risk Reduction (UNDRR), as of 2021, international financial commitments have not met global targets with ODA disbursements averaging at 0.39 % of Gross National Income (GNI) since 2010, against the committed target of 0.7 %.<sup>149</sup> It is also necessary to note, that “for every USD 100 spent on disaster-related ODA, only 50 cents are invested in protecting development from the impact of disasters.”<sup>150</sup>

Given that disasters impede sustainable development and the economic growth of SIDS, there is a need to examine the availability of and access to financial resources within and outside SIDS, for preventing, mitigating and responding to disasters. This section will explore key SIDS-specific gaps and challenges in accessing financing for DRR.

---

<sup>142</sup>UN. 2019. High-Level Political Declaration on the Midterm Review of the Samoa Pathway. Available online at: <https://www.un.org/pga/73/wp-content/uploads/sites/53/2019/08/SAMOA-MTR-FINAL.pdf>

<sup>143</sup>OECD/World Bank/GFDRR. 2016. Climate and Disaster Financing in Small Island Developing States. Available online at: <https://reliefweb.int/report/world/climate-and-disaster-resilience-financing-small-island-developing-states>

<sup>144</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at: [https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>145</sup>UNDRR. Understanding Disaster Risk. Available online at: <https://www.preventionweb.net/understanding-disaster-risk/risk-drivers/climate-change>

<sup>146</sup>UNCTAD. 2022. Climate Financing for SIDS is Shockingly Low: Why This Needs to Change. Available online at: <https://unctad.org/news/climate-finance-sids-shockingly-low-why-needs-change>

<sup>147</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at: [https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>148</sup>ADB. 2020. Financing Disaster Risk Reduction in Asia and the Pacific. Available online at: <https://www.adb.org/sites/default/files/institutional-document/670596/financing-disaster-risk-reduction-asia-pacific.pdf>

<sup>149</sup>UNDRR. 2021. International Cooperation in Disaster Risk Reduction, United Nations Office for Disaster Risk Reduction. Available online at: <https://www.undrr.org/publication/international-cooperation-disaster-risk-reduction-target-f>

<sup>150</sup>Ibid.

### 3.1 Challenges in Accessing Concessional Financing

#### Summary Box - Challenges in Accessing Concessional Financing

- SIDS are exceptionally reliant on development assistance, remittances and international financial support.
- Accessing financing for DRR by SIDS is a complicated affair. Donors often require complex documentation for application for concessional financing, which is duplicative, and not streamlined
- Global financing environment does not account for the challenges that small countries, with small public service staff face in accessing such resources.
- Eligibility for funds is also an ongoing challenge for middle-or-high income SIDS
- SIDS have to face high costs in managing concessional financing. The cost of managing multiple small projects exacerbates institutional resources.
- Some donors require co-financing for projects, which is difficult to generate in small countries with limited industries.
- Much of concessional financing is tied in short-term projects
- All SIDS are not equal beneficiaries: historic, cultural and geopolitical ties play a significant role in which islands receive concessional financing
- SIDS are also often recipients of regional projects. While this can enhance regional coordination, it also means that small funds are broken up further among countries
- Projects and grants may be donor-driven, rather than based on nationally identified priorities
- Delayed funding: Some proposals take extensive time to be approved and by the time they do, several years have passed since the

SIDS are exceptionally reliant on development assistance, remittances and international financial support. Grants and concessional loans are key aspects of development financing and SIDS receive 3 % of global ODA. Of the three SIDS regions, the Pacific receives the most aid. As a country, Haiti relies heavily on aid.<sup>151</sup> Despite these finance flows, the absorptive capacity, onerous processes for accreditation,<sup>152</sup> and a lack of human resources available to apply/manage concessional finance remains a limiting issue, affecting implementation of the Sendai Framework.

Accessing financing for DRR by SIDS is a complicated affair. The grant-making architecture is composed of numerous donors, with differing, and at times, overlapping proposal requirements and timelines, which are challenging to manage given SIDS' limited availability of human resources. **The global financing environment does not account for the challenges that small countries, with small public service staff face in accessing such resources.** As noted by the OECD, on average, SIDS rely on a single provider for 46 % of their concessional finance.<sup>153</sup> This indicates that **ease of access to financing is a crucial consideration** for SIDS when applying for concessional financing. This point is reinforced in an independent evaluation of the GCF which notes: "the current GCF model for access and accreditation is a disadvantage to SIDS with lower capacity, experience or confidence to access the GCF on their own."<sup>154</sup>

One specific issue noted by SIDS is that **donors often require complex documentation** for application for concessional financing, **which is duplicative, and not streamlined.** This means that limited staff spends considerable time re-adapting the same types of information into several different formats. This is a non-optimal use of time and labour, as new information is not being generated or processed, but simply readjusted from requirement to requirement.

---

<sup>152</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at: [https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

<sup>153</sup>Ibid.

<sup>154</sup>GCF. 2020. Independent Evaluation of the Relevance and Effectiveness of the Green Climate Fund's Investments in Small Island Developing States. Available online in: <https://ieu.greenclimate.fund/sites/default/files/document/201123-sids-final-report-top-web.pdf>



## Key Message

Application processes for concessional financing must be improved and simplified. Donors should harmonize templates and requirements to reduce time/labour costs which prevent SIDS from applying for available financing.



### Eligibility for funds is also an ongoing challenge for SIDS.

Middle-or-high-income SIDS may have greater challenges in accessing concessional financing due to their GDP status. While these SIDS may be receiving proportional financial support, appropriate to their GDP, LDCs may be receiving far more support through other mechanisms and sources, which SIDS do not have access to. In Cabo Verde for instance, graduation to a low middle-income country (LMIC) status, meant that the country could no longer access funding for National Adaptation Programmes of Action (NAPA) for climate change, which are designed to increase adaptive capacity and access to financing. Losing such funding also means more challenges to apply for support from other mechanisms such as the GCF, which requires a developed baseline that could otherwise be supported through NAPA projects.<sup>155</sup>

It is also worth noting that **some SIDS may be graduating to middle-income status due to a**

**single industry**, such as tourism, which demonstrates their dependency and vulnerability, should there be any shocks.<sup>156</sup> There are also indications that some SIDS that may be graduating to low middle-income countries, but are still highly dependent on ODA, which represents a lack of diversification or resilience in their economy. Referencing the above paragraph, Cabo Verde is one such example.<sup>157</sup>

There is also the assumption that graduation will mean an increase in foreign direct investment and financial flows. The literature demonstrates that there is little evidence that all graduated SIDS see a direct positive effect on private capital flows and foreign direct investment.<sup>158</sup> Maldives, is one of the exceptions to this, but there is a tendency to finance sectors that are already well-supported such as tourism and construction, which prevents investment in other sectors of the country.<sup>159</sup>

Similarly, middle-income graduation does not mean that SIDS are as resilient as continental states with a similar status. As the OECD notes, upper middle-income SIDS are 73 % more vulnerable than other upper middle-income countries.<sup>160</sup> As noted by the government of Antigua and Barbuda in 2018, the country was disqualified from access to concessional loans, which may be due to a “skewed” version of development.<sup>161</sup>

There are also **high costs related to managing concessional financing**. In addition to the costs to apply for funding partners, there is the responsibility of appropriate monitoring, reporting, evaluating and mobilizing stakeholders from dispersed territories. The cost of managing multiple small projects exacerbates institutional resources.<sup>162</sup> Often times, project budgets do not take into account the high cost of managing projects within SIDS—it costs much more to

<sup>155</sup>Morris, R., Cattaneo, O., Poensgen, K. 2019. Transition Finance in Least Developed Countries and Small Island Developing States: Cabo Verde Country Pilot. Organisation for Economic Cooperation and Development: Paris. Available online at: <https://doi.org/10.1787/1affcac6-en>

<sup>156</sup>Quak, E. 2019. How Losing Access to Concessional Finance Affects Small Island Developing States. Available online at: [https://assets.publishing.service.gov.uk/media/5d41b473ed915d09de9d1af4/626\\_SIDS\\_graduation\\_impacts\\_losing\\_concessional\\_finance.pdf](https://assets.publishing.service.gov.uk/media/5d41b473ed915d09de9d1af4/626_SIDS_graduation_impacts_losing_concessional_finance.pdf)

<sup>157</sup>Ibid.

<sup>158</sup>Ibid.

<sup>159</sup>Ibid.

<sup>160</sup>OECD. 2018. Making Development Co-operation Work for Small Island Developing States. Available online at: <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/OECD-SIDS-2018-Highlights.pdf>

<sup>161</sup>Quak, E. 2019. How Losing Access to Concessional Finance Affects Small Island Developing States. Available online at: [https://assets.publishing.service.gov.uk/media/5d41b473ed915d09de9d1af4/626\\_SIDS\\_graduation\\_impacts\\_losing\\_concessional\\_finance.pdf](https://assets.publishing.service.gov.uk/media/5d41b473ed915d09de9d1af4/626_SIDS_graduation_impacts_losing_concessional_finance.pdf)

<sup>162</sup>OECD. 2018. Making Development Co-operation Work for Small Island Developing States. Available online at: <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/OECD-SIDS-2018-Highlights.pdf>

conduct stakeholder consultations especially in dispersed territories, and invite foreign experts to reach SIDS. There is also a smaller repository of national experts within SIDS that can be mobilized as consultants if numerous projects are underway. The cost of delivering assistance in a SIDS context is estimated to be 4.7 times higher than in other developing countries.<sup>163</sup>

There is also the issue that some donors, such as the GEF and GCF, require co-financing for projects. For small countries dependent on limited sources of ODA and national revenue, it is **difficult to generate the levels of co-financing required for project implementation**, which sometimes can be up to seven times a project budget. This is a point noted in a GCF evaluation which remarks that SIDS raised significantly less private sector co-financing than non-SIDS country recipients—USD 18 million in SIDS, compared to over USD 3 billion in non-SIDS countries.<sup>164</sup>

### Key Message

DRR projects must take into account high costs of project implementation in SIDS. Project management costs and fees need to be higher in SIDS to account for elevated cost of project delivery due to remoteness, geographic dispersion, and limited HR; co-financing requirements should be lower.

Another challenge is that **much of concessional financing is tied in short-term projects**. Risk reduction measures take time and may not be easily accomplished in four-to-five-year projects. The longer-term approach to capacity development, technological innovation, shifts in public perception and awareness, require more long-term sustained support. The short-term project approach can drive SIDS to focus on short-term deliverables to satisfy donor requests, rather than respond to structural long-term needs.

### Key Message

SIDS would benefit much more from a programmatic approach with sustained accompaniment than from multiple short-term projects

Another feature of concessional financing is that **all SIDS are not equal beneficiaries**. Historic, cultural and geopolitical ties play a significant role in which islands receive concessional financing.<sup>165</sup> Donors play a huge role in DRR outcomes—who they select as beneficiaries, and how they choose to disseminate their funds affect the kinds of activities that can be executed.

There is also a tendency of financing for SIDS according to geographic proximity. Often regional banks such as Asian Development Banks (ADB), African Development Bank (AfDB), and Inter-American Development Bank (IADB) provide grants and loans on a geographic basis. Due to their small nature, **SIDS are also often recipients of regional projects**. While this can enhance regional coordination, bring countries to similar levels in terms of DRR, it also means that small funds are broken up further among small countries, and that country-specific discrepancies can go unaddressed.

An associated constraint is the **donor-driven nature of projects and grants**, which are often not entirely based on nationally identified priorities. Specific funding requirements and criteria indicate that SIDS may at times be responding to donor priorities rather than their own interests. This is of course not the case in all SIDS—ODA in some SIDS are guided by priorities identified in national development plans. In some cases, the government entity responsible for ODA ensures that they review country programmes and application for grants to ensure alignment with government development priorities. Yet, this requires staff time and financing flexibility.

There is also the challenge that some proposal requirements are unclear and onerous to manage. It was noted in an evaluation of the GCF,

<sup>163</sup>OECD. 2018. Making Development Co-operation Work for Small Island Developing States. Available online at: <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/OECD-SIDS-2018-Highlights.pdf>

<sup>164</sup>GCF. 2020. Independent Evaluation of the Relevance and Effectiveness of the Green Climate Fund's Investments in Small Island Developing States. Available online in: <https://ieu.greenclimate.fund/sites/default/files/document/201123-sids-final-report-top-web.pdf>

<sup>165</sup>OECD. 2018. Making Development Co-operation Work for Small Island Developing States. Available online at: <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/OECD-SIDS-2018-Highlights.pdf>

for instance, that SIDS have been underrepresented in the proposal pipeline.<sup>166</sup> The GCF's proposal process is lengthy, requires accreditation of national bodies and is complicated. SIDS require trainings just to enter the proposal writing process which is a significant cost of time and human resources.

### **Delayed funding is also a challenge for SIDS.**

Some proposals take significant time for development, submission and approval. By the time the funds become available, several years may have passed since the original concept. This forces SIDS to revise proposals, amend activities which may require further approval by donors. This can be an opportunity cost to other timely financing. Delays may require a re-engagement of stakeholders who may be disillusioned due to the lag time between programme concept and approval.

### **3.1.1 Ex-Post versus Ex-ante Financing**

#### **Summary Box-Ex-Post versus Ex-Ante Financing**

Disaster-related financing is unbalanced: There is a tendency to provide concessional funds in the aftermath of extreme events following a disaster event (ex-post), rather than in preparation, for and prevention of disasters, including reduction of existing risk. DRR-related financing tends to come from humanitarian budgets to address humanitarian crises, rather than for development financing for prevention, risk reduction and preparedness prior to an event. Underinvestment in resilience-building highlights the need to fund risk-informed development initiatives across sectors. Risk-informed development calls for a more-long-term approach and is generally underfunded

Financing for DRR is identified as a necessity for SIDS, yet **disaster-related financing is unbalanced**.<sup>167</sup> This has been noted by Member States, driven by SIDS, and resulted in a request made by the United Nations General Assembly (UNGA) to call for "an examination of the disaster-related funding and support environment, with a view to the possible development of a targeted voluntary disaster fund, mechanism or financial instrument, coordinated with and complementary to existing mechanisms, to assist small island developing States (SIDS) in managing disaster risk and building back better after disasters."<sup>168</sup>

There is a tendency to provide concessional funds in the aftermath of extreme events following a disaster event (ex-post), rather than in prevention, preparation, and risk reduction.<sup>169</sup> Even in countries outside of SIDS, it is noted that 90 % of international funding is geared towards recovery work, with only 10 % on prevention.<sup>170</sup> DRR-related financing tends to come from humanitarian budgets to address humanitarian crises, rather than for development financing.<sup>171</sup> Although ODA correlates with disaster response and reconstruction needs, there is insufficient investment to prevent and reduce the existing stock of risk in areas of increased vulnerability and mortality. **ODA targets post-disaster circumstances more so than the multi-dimensional vulnerability of populations.**<sup>172</sup>

<sup>166</sup>GCF. Independent Evaluation of the Relevance and Effectiveness of the Green Climate Fund's Investments in Small Island Developing States. (2020) Available online at: <https://ieu.greenclimate.fund/sites/default/files/document/201123-sids-final-report-top-web.pdf>

<sup>167</sup>Hook, S. 2021. Disaster Risk Financing for Small Island Developing States. Available online at: [https://sdgs.un.org/sites/default/files/2022-01/Disaster\\_Risk\\_Financing\\_forSIDS\\_DraftFinalReport.pdf](https://sdgs.un.org/sites/default/files/2022-01/Disaster_Risk_Financing_forSIDS_DraftFinalReport.pdf)

<sup>168</sup>UNGA. 2020. Seventy-fourth session Agenda item 19 (b) Sustainable development: follow-up to and implementation of the SIDS Accelerated Modalities of Action (SAMOA) Pathway and the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States Resolution A/RES/74/217. Available online at: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N19/435/95/PDF/N1943595.pdf?OpenElement>

<sup>170</sup>OECD. 2018. Making Development Co-operation Work for Small Island Developing States. Available online at: <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/OECD-SIDS-2018-Highlights.pdf>

<sup>171</sup>Donback, N. 2020. What We Can Learn from Disaster Risk Reduction Efforts in Small Islands. Available online at: <https://www.devex.com/news/what-we-can-learn-from-disaster-risk-reduction-efforts-in-small-islands-96072>

<sup>172</sup>Hook, S. 2021. Disaster Risk Financing for Small Island Developing States. Available online at: [https://sdgs.un.org/sites/default/files/2022-01/Disaster\\_Risk\\_Financing\\_forSIDS\\_DraftFinalReport.pdf](https://sdgs.un.org/sites/default/files/2022-01/Disaster_Risk_Financing_forSIDS_DraftFinalReport.pdf)



Photo: UN Photo/Eskinder Debebe

A programmatic approach and a reliable source of funding that could address underlying sources of vulnerability, is thus lacking.<sup>173</sup> An example of this is in Antigua and Barbuda, where there was no ODA recorded in 2016, but where financing was provided in 2017 on humanitarian grounds following Hurricane Irma.<sup>174</sup>

Resilience-building is emphasized in many sustainable development fora, in addition to the Sendai Framework. Most notably the SAMOA Pathway, the Addis Ababa Action Agenda, the 2030 Agenda and the Paris Agreement all identify resilience-building and disaster risk-informed development as beneficial to both poverty-alleviation and for economic growth.<sup>175</sup> This emphasis can be leveraged to addressing the imbalance in DRR financing. Development and investments that are risk-informed and prevention-oriented underpin the sustainability and resilience of systems and societies, saving lives, livelihoods, and safeguarding public and private investments, and must be further supported.<sup>176</sup>

There is also often an emotional component to rebuilding after a disaster. Loss of lives, the displacement of people, hardship, challenges with food and water security, motivate countries,

civil society organizations and citizens to support recovery initiatives. In such circumstances, there is the risk that recovery initiatives can be ad hoc, without necessarily focusing on 'building back better' in the rush to address immediate and medium-term needs. There is also the concern that political pressures may force governments to act quickly, or allow them to appear to be acting quickly, and may result in actions that are too focused on addressing the disaster just experienced, rather than multi-hazard risk.<sup>177</sup> As noted by UNDRR, "Innate biases and mental short cuts can make people's thinking myopic, or prone to inertia, oversimplification or herding when making decisions around risk. This helps explain why people, and the institutions they work for, can resist making good decisions about risk, even in the face of clear scientific data. These biases are particularly likely to kick in when risks are newly felt, and therefore unfamiliar, as is the case with many systemic risks such as climate change or a pandemic."<sup>178</sup>

COVID-19 has revealed underinvestment in disaster risk reduction and resilience, and has highlighted the need to fund risk-informed development initiatives. Risk-informed development calls for a more long-term approach and is generally underfunded.<sup>179</sup>

<sup>173</sup>OECD. 2018. Making Development Co-operation Work for Small Island Developing States. Available online at: <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/OECD-SIDS-2018-Highlights.pdf>

<sup>174</sup>Quak, E. 2019. How Losing Access to Concessional Finance Affects Small Island Developing States. Available online at: [https://assets.publishing.service.gov.uk/media/5d41b473ed915d09de9d1af4/626\\_SIDS\\_graduation\\_impacts\\_losing\\_concessional\\_finance.pdf](https://assets.publishing.service.gov.uk/media/5d41b473ed915d09de9d1af4/626_SIDS_graduation_impacts_losing_concessional_finance.pdf)

<sup>175</sup>World Bank/GFDRR. 2016. Building Resilience – Integrating Climate and Disaster Risk into Development. Available online at: <https://www.gfdr.org/en/publication/building-resilience-integrating-climate-and-disaster-risk-development>

<sup>176</sup>OECD/GFDRR. 2016. Climate and Disaster Financing in Small Island Developing States. Available online at: <https://reliefweb.int/report/world/climate-and-disaster-resilience-financing-small-island-developing-states>

<sup>177</sup>UNDRR. 2021. International Cooperation in Disaster Risk Reduction, United Nations Office for Disaster Risk Reduction.

<sup>178</sup>OECD. 2018. Making Development Co-operation Work for Small Island Developing States. Available online at: <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/OECD-SIDS-2018-Highlights.pdf>

<sup>179</sup>Quak, E. 2019. How Losing Access to Concessional Finance Affects Small Island Developing States. Available online at: [https://assets.publishing.service.gov.uk/media/5d41b473ed915d09de9d1af4/626\\_SIDS\\_graduation\\_impacts\\_losing\\_concessional\\_finance.pdf](https://assets.publishing.service.gov.uk/media/5d41b473ed915d09de9d1af4/626_SIDS_graduation_impacts_losing_concessional_finance.pdf)

### **3.1.2 Climate Change Adaptation Financing Versus Disaster Risk Reduction Financing**

#### **Summary Box- Climate Change Adaptation Financing Versus Disaster Risk Reduction Financing**

Both DRR and climate change adaptation seek to reduce vulnerability, strengthen resilience of societies and share common concepts such as risk management.

There are far more funds available for climate adaptation work, than for DRR

The disadvantages of this division between climate change adaptation activities and DRR are the following:

- Redundancy of activities, duplication
- Investments are not optimized inter-sectorally
- DRR is not mainstreamed into climate change adaptation, which can lead to maladaptation
- Lack of resources targeted specifically for DRR
- Political salience of climate change adaptation rather than DRR by dint of being able to mobilize more resources
- Policy divisions, lack of policy coherence and integration
- DRR seen as only falling to national disaster management offices' (NDMO) staff and not sufficiently owned/managed by other sectoral partners
- DRR-friendly activities go un-measured

An interesting challenge noted by SIDS, is the **imbalance between climate change adaptation financing versus risk reduction financing**. This seems counterintuitive, given that there is a clear nexus among strengthening adaptation, reducing disaster risk, and building resilience. DRR and climate change adaptation (CCA) seek to reduce vulnerability, strengthen resilience of societies, and share common concepts such as risk management, mainstreaming and 'no-regrets' interventions.<sup>180</sup> However, as noted by SIDS, there are greater funds available for climate adaptation work, than for DRR.<sup>181</sup> While one can infer that CCA funds contribute to DRR if implemented strategically, the following challenges remain:

- Requirements from donors on climate financing include specific reporting, and actionable outputs which do not provide results on DRR-relevant indicators or

activities.

- CCA work may involve different ministries than those responsible for disaster risk management (e.g., environment)—this siloes the work and does not allow it to be leveraged sufficiently by disaster management authorities.
- Political commitments may differ between what is perceived as CCA and DRR work. The Sendai Framework, for instance, notes that actions related to DRR are the responsibility of each country but requires an all-of -society approach whereas the United Nations Framework Convention on Climate Change (UNFCCC), identifies the responsibility of climate change rests with industrialised developed countries, with inclusion of all countries to reduce emissions.<sup>182</sup>
- The framing of activities may differ-- adaptation versus risk reduction, also changes SIDS' access to funds and partnerships. The UNFCCC has several funds that serve the convention, such as the
- Adaptation Fund, GEF, and GCF, whereas there are few specific funds committed only to DRR.<sup>183</sup>
- SIDS may not be able to access environmental/climate funds due to criteria if a project is perceived as too DRR-focused

---

<sup>180</sup>UNISDR. 2012. The Pacific Experience in Developing Policy and Legislation on Disaster Risk Reduction and Climate Change Adaptation. Available online at: [https://www.unisdr.org/files/34003\\_34003pacificexperienceonlegislation.pdf](https://www.unisdr.org/files/34003_34003pacificexperienceonlegislation.pdf)

<sup>181</sup>Caribbean Workshop

<sup>182</sup>Hook, S. 2021. Disaster Risk Financing for Small Island Developing States. Available online at: [https://sdgs.un.org/sites/default/files/2022-01/Disaster\\_Risk\\_Financing\\_forSIDS\\_DraftFinalReport.pdf](https://sdgs.un.org/sites/default/files/2022-01/Disaster_Risk_Financing_forSIDS_DraftFinalReport.pdf)

<sup>183</sup>Ibid.

The disadvantages of this division between CCA activities and DRR are the following:

- Redundancy of activities, duplication—implementation of similar projects which if crafted holistically could lead to mutual and co-benefits.
- Investments are not optimized inter-sectorally; CCA projects to benefit certain departments/ministries while national disaster management offices may not receive resources from CCA interventions.
- DRR is not mainstreamed into climate change adaptation, leading to maladaptation in some sectors and systems; inappropriate responses to climate change create long-term lock-in of vulnerability, exposure and risks.
- Political salience of CCA rather than DRR by dint of being able to mobilize more resources leading to a lack of resources targeted specifically for DRR
- Policy divisions, lack of policy coherence and integration
- DRR perceived as the responsibility of national disaster management offices'(NDMO) staff and not sufficiently owned/managed by other sectoral partners
- DRR benefits from CCA activities go un-measured and un-accounted

SIDS have expressed the need for more dedicated DRR financing. As was noted by the Dominican Republic at the recent 7<sup>th</sup> Session of the Global Platform for Disaster Risk Reduction (GP2022), financial instruments for least developed countries (LDCs) and SIDS need to focus on disaster mitigation, resilience strengthening, and technology transfer.<sup>184</sup>


Despite this competition for limited resources, it is worth noting that climate financing for SIDS is still quite low. As noted by UNCTAD, "Despite being hit hard by climate change while only contributing to 1 % of global carbon dioxide emissions, they [SIDS] only had access to USD 1.5 billion out of USD 100 billion in climate finance pledged to developing countries in

2019."<sup>185</sup>

There are some integrated approaches that currently mutually address CCA and disaster risk planning. For instance, early warning systems (EWS) projects provide the dual benefits of targeting adaptation while also strengthening hydro-meteorological and communications facilities, and support risk-reduction planning. EWS are integral components of both climate change adaptation and disaster risk reduction,<sup>186</sup> and offer entry points where funds can be leveraged to mutually support both areas of work. In the Pacific region, the Joint National Action Plans (JNAP) provide an entry point to coordinate CCA and DRR.<sup>187</sup>

In the Caribbean, the Caribbean Community Climate Change Centre (CCCCC) and Caribbean Disaster Emergency Management Agency (CDEMA) support an integrated approach to DRR and CCA. The Caribbean has established a governance mechanism—the Comprehensive Disaster Management Coordination and Harmonisation Council (CDMCHC)—which provides management and technical guidance to ensure that the implementation of comprehensive disaster management activities within and between countries and across different sectors, is coordinated and harmonized.<sup>188</sup>

### Key Message



Climate adaptation financing should include DRR indicators and metrics to ensure value of investment. Climate financing can then contribute to long-term resilience, through supporting both adaptation and risk-reduction activities. This will allow SIDS to access more opportunities for DRR work, while supporting coherent and risk-informed adaptation.

<sup>184</sup>IISD. 2022. Report of the Main Proceedings for 26 May 2022: Mid-Term Review Plenaries. 7th Session of the Global Platform for Disaster Risk Reduction (GP2022). Available online at: <https://enb.iisd.org/global-platform-disaster-risk-reduction-gp2022-daily-report-26may2022>

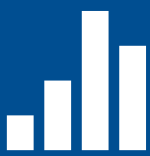
<sup>185</sup>UNCTAD. 2022. Climate Finance for SIDS is Shockingly Low: Why This Needs to Change. Available online at: <https://unctad.org/news/climate-finance-sids-shockingly-low-why-needs-change>

<sup>186</sup>EU/ClimateAdapt. 2021. Establishing Early Warning Systems. Available online at: <https://climate-adapt.eea.europa.eu/metadata/adaptation-options/establishment-of-early-warning-systems>

<sup>187</sup>UNISDR. 2012. The Pacific Experience in Developing Policy and Legislation on Disaster Risk Reduction and Climate Change Adaptation. Available online at: [https://www.unisdr.org/files/34003\\_34003pacificexperienceonlegislation.pdf](https://www.unisdr.org/files/34003_34003pacificexperienceonlegislation.pdf)

<sup>188</sup>UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at: [https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

Given the increasing impacts of climate change, building resilience in SIDS is essential to achieve sustainable development.<sup>189</sup> This is especially the case when one examines the value proposition of investing in resilience. According to the Asian Development Bank (ADB), "The business case for resilience investments is compelling with an average USD 1 spent saving USD 4–7 in response".<sup>190</sup>



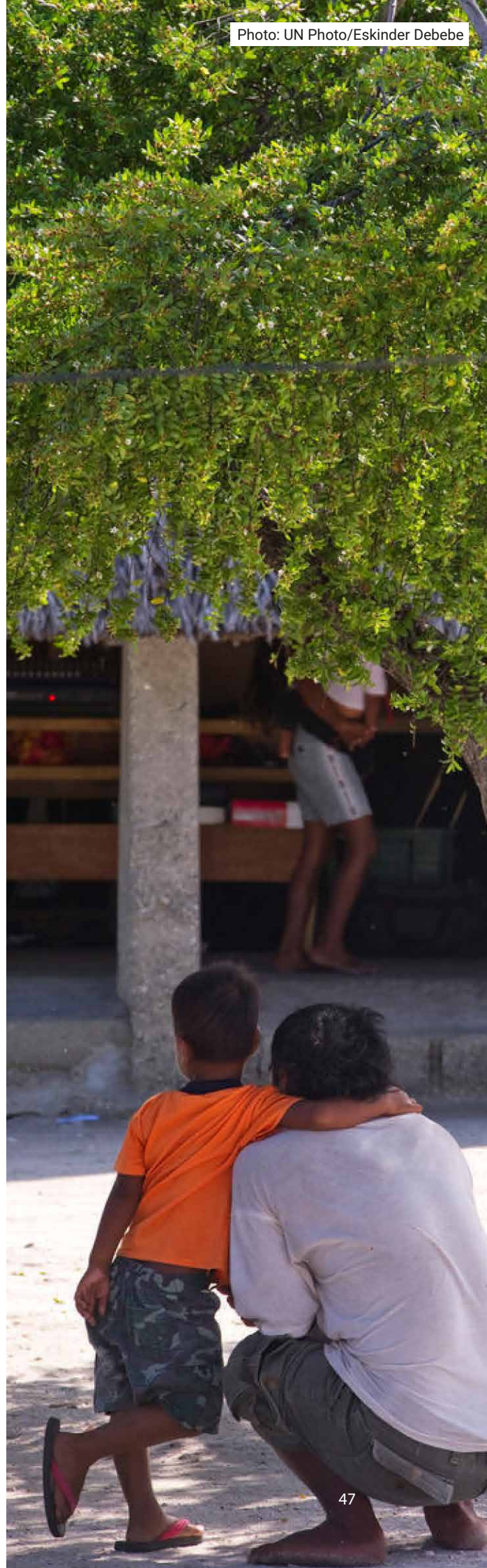
The business case for resilience investments is compelling with an average \$1 spent saving \$4–\$7 in response (ADB)

Some of the challenges SIDS are facing to access concessional financing are being addressed. Recently, the GEF has replenished a financing window dedicated to the 30 SIDS (that are also LDCs) through its Special Climate Change Fund (SCCF). This window is the first of its kind and will provide USD 90 million; USD 3 million per SIDS for non-LDC countries and raise the ceiling for LDC SIDS to USD 20 million. Part of the rationale of this fund is to take into account the challenges SIDS face in obtaining financing.<sup>191</sup>

<sup>189</sup>OECD/GFDRR. 2016. Climate and Disaster Financing in Small Island Developing States. Available online at: <https://reliefweb.int/report/world/climate-and-disaster-resilience-financing-small-island-developing-states>

<sup>190</sup>ADB. 2020. Financing Disaster Risk Reduction in Asia and the Pacific. Available online at: <https://www.adb.org/sites/default/files/institutional-document/670596/financing-disaster-risk-reduction-asia-pacific.pdf>

<sup>191</sup>AOSIS. 2022. Global Environment Facility Dedicates a Climate Fund for SIDS. Available online at: <https://www.aosis.org/global-environment-facility-dedicates-a-climate-fund-for-sids/>



## 3.2 Domestic Resources & Private Sector

### Summary Box- Domestic Resources and Private Sector in SIDS

- SIDS often lack strong fiscal revenues and domestic savings, meaning that SIDS' governments need to divert scarce public resources from essential social and economic development investments to address disaster-related needs.
- Governments can generate some income to fund recovery through general revenue, however general and tied budget support from donor partners is required due to limited national revenue
- SIDS generally have small private sectors—ones that has been battered by the COVID-19 pandemic
- Even prior to the pandemic, many small and medium enterprises (SMEs) struggled with cash reserves
- Informal businesses are struggling and need access to emergency business grants, loans or cash transfers to help survive the impact of the pandemic, limiting their possible contributions to DRR.
- Capital market investments do not account for disaster risk
- Innovative approaches across public and private finance are needed, e.g., conducting analysis of national financial stability in the event of a disaster and the development of common standards, lexicon, and taxonomy to tag and track cross-sectoral expenditure and investments in disaster risk reduction and assess their resilience dividend.
- Dedicated disaster risk reduction financing strategies should be included and amalgamated in integrated national financing frameworks, with clear investment priorities.
- Insurance has been evolving and could play a potentially greater role in DRR, however risk insurance facilities require external support to deliver commitments. There is a need for further development of products that incentivize risk reduction and prevention, such as through variable pricing and policy prerequisites or exemptions to provide incentives for risk reduction.
- Self-insurance- sovereign wealth funds, disaster funds, and/or stabilization funds that countries invest in may not be sufficient to address the cost of severe disasters
- Insurance by smaller entities for personal and business property may offer premiums that are too high for people to afford, and micro insurances may not be able to finance the cost of destruction from severe hazards

- For the emergency risk facilities that currently exist, capacity constraints prevent SIDS from accessing them easily
- Microfinancing for DRR largely remains at the nascent stage and is supported by larger financial institutions or development partners in SIDS

**SIDS often lack strong fiscal revenues and domestic savings, requiring governments to divert scarce public resources from essential social and economic development investments to address disaster response needs.** This compromises other public investments and potential future growth, and sustainable development.<sup>192</sup> As countries are forced to respond to higher disaster-related costs, investments suffer in other areas, leaving those sectors more vulnerable and exposed to hazards and crises, creating an unvirtuous cycle.

With climate change, there is the risk of more frequent natural hazards, exacerbating and overwhelming public resources available, and being compounded by other kinds of hazards. Vanuatu provides an example of the challenges a country's institutions undergo when they suffer several crises at once. Vanuatu experienced two major category 5 cyclones in less than 5 years (Tropical Cyclone Pam and Tropical Cyclone Harold), and has faced economic insecurity brought on by the COVID-19 pandemic—the closing of its borders led to lost tourist revenue, and limited access to recovery and aid efforts.<sup>193</sup> As noted in the Vanuatu Recovery Strategy (2022-2023): TC Harold & COVID-19, the government can generate some income to fund recovery through general revenue, however **general and tied budget support needs to come from donor partners due to limited revenue.**<sup>194</sup>

---

<sup>192</sup>OECD/GFDRR. 2016. Climate and Disaster Financing in Small Island Developing States. Available online at: <https://reliefweb.int/report/world/climate-and-disaster-resilience-financing-small-island-developing-states>

<sup>193</sup>UN DESA. Pardo, M. 2021. Disasters After Disasters- Short-Recovery Intervals and Large Financial Gaps in Small Island Developing States. Available online at: <https://www.preventionweb.net/news/disasters-after-disasters-short-recovery-intervals-and-large-financial-gaps-small-island>

<sup>194</sup>Government of Vanuatu. Vanuatu Recovery Strategy (2022-2023) TC Harold & COVID-19. Available online: <https://dsppac.gov.vu/images/roc/vanuatu-recovery-strategy.pdf>



Addressing compounding challenges means that countries may have to take decisions that undermine the recovery of one sector over another.<sup>195</sup>

There is also the challenge of insufficient allocation of national revenue for DRR. In Cabo Verde, 10 % of the State budget is allocated to municipalities. However, in this decentralized structure, municipalities are not compelled to allocate part of the budget to emergency preparedness, disaster prevention, risk reduction, response to disaster or on crisis management.<sup>196</sup> Without clear national allocation and mandates for local-level budgeting, DRR efforts remain underfunded and unable to generate the kind of resilience that will limit loss of life, resources, and livelihoods. SIDS should thus identify key investment priorities for DRR in national financing plans.

National disaster risk reduction financing strategies can enable countries to estimate the resources needed to implement disaster risk reduction strategies and enhance integrated national and local budgetary allocation for prevention and risk reduction in all sectors. More innovative approaches across public and private finance are also needed, such as conducting analysis of national financial stability in the event of a disaster and the development of common standards, lexicon, and taxonomy to tag and track cross-sectoral expenditure and investments in disaster risk reduction and assess their resilience dividend.

### **Key Message**

Dedicated disaster risk reduction financing strategies should be included and amalgamated in integrated national financing frameworks, with clear investment priorities.



### **Best Practices**

Despite there being challenges in mobilizing domestic financing, SIDS have taken steps to budget accordingly, noting both the risk reduction factors and recovery costs exploring means to mobilize funds.

- Typhoon Winston in 2016 created losses of USD 1.28 billion, about 31% of Fiji's GDP. In response to such damages, SIDS in the Pacific have adopted the Framework for Resilient Development in the Pacific which seeks to place climate and disaster risk within the framework of regional economic development. By encompassing disaster risk considerations within economic development plans, SIDS are developing more sound policies.
- In Jamaica, there is a Draft National Disaster Risk Financing Policy. This seeks to strengthen financial resilience through pre-arranged financing instruments such as a contingency fund, contingency credit, and catastrophe insurance from the Caribbean Catastrophe Risk Insurance Facility (CCRIF).

### **Private Sector Financing**

The private sector is often identified as an area that could contribute to greater DRR financing. However, **SIDS generally have small private sector—one that has been battered by the COVID-19 pandemic.**

Larger firms are more likely than small businesses to have business continuity plans and cash reserves to buffer them through various crises including the pandemic. **Even prior to the pandemic, many small and medium enterprises (SMEs) in SIDS struggled with cash reserves.**<sup>197</sup> Many have exhausted their existing reserves and are increasingly vulnerable to economic conditions, which does not leave them in favorable positions to engage in prevention and risk-reduction activities for which they do not immediately see a return. Similarly, **informal businesses are struggling and seek to access emergency business grants, loans or cash transfers to help them survive the impact of the pandemic, limiting their possible contributions to DRR.**<sup>198</sup>

<sup>195</sup>UN DESA. Pardo, M. 2021. Disasters After Disasters- Short-Recovery Intervals and Large Financial Gaps in Small Island Developing States. Available online at: <https://www.preventionweb.net/news/disasters-after-disasters-short-recovery-intervals-and-large-financial-gaps-small-island>

<sup>196</sup>World Bank/GFDRR. 2020. Cabo Verde Emergency Preparedness and Response Diagnostic: Building a Culture of Preparedness.

<sup>197</sup>UNDRR. 2021. Caribbean Magazine: Road to Recovery. Available online at: <https://tsunamiday.undrr.org/theme/early-warning>

<sup>198</sup>Ibid.

There is also the challenge that **capital market investments do not account for disaster risk**, due to an underlying expectation that disaster prevention and risk reduction are the responsibility of governments. As a result, the cost of disaster remains outside of private sector decision-making, putting the burden on public systems and missing opportunities for risk-informed planning and investments.<sup>199</sup>

The private sector does have a vested interest in supporting DRR initiatives. In particular, the tourism industry is dealing with increasing costs as the frequency and intensity of hazards increases. Rising sea levels have augmented insurance premiums on coastal hotels, as well as on service disruption, and damage repair.<sup>200</sup> Hazards increase the cost of operations and disasters threaten decreased tourism.

### Examples of Engaging the Private Sector

Countries are identifying ways in which private sector partners can be better mobilized. In Vanuatu, for instance, the private sector has often engaged in an ad hoc fashion on DRR issues. To address this, the Vanuatu Chamber of Commerce and Industry, GIZ and UNDP established the Vanuatu Business Resilience Council in 2017 to strengthen the coordination of private sector efforts in disaster preparedness, response and recovery and policy engagement.<sup>201</sup>

In Papua New Guinea, Exxon Mobile has played a key role in disaster preparedness and recovery efforts. They have contributed funds and conduct regular emergency drills for their employees, in particular on oil spills.<sup>202</sup>

Some **private sector tourism partners are engaging through nature-based solutions**. For instance, the Iberostar group has committed to planting 1,500 mangroves in its seafront property in the Dominican Republic. With 80 % of its hotels being on the coast, the company is seeking to decrease 75 % of its emissions through blue carbon solutions.<sup>203</sup>

**Insurance** is an area explored to build support for individuals and assets in the circumstance of disaster. The Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC) offers parametric insurance and gives governments access to short-term liquidity mechanisms to address emergency needs following tropical cyclones, earthquakes, excess rainfall, fisheries and supporting public utilities sectors.<sup>204</sup> This model has also been replicated in by the African Risk Capacity (ARC) and the Pacific Catastrophe Risk Insurance Company (PCRIC).<sup>205</sup> Since 2007, CCRIF has made 54 payouts to 16 of its members, for approximately USD 245 million within 14 days of a disaster.<sup>206</sup> Haiti received the largest payout historically, after the earthquake in 2021. During 2020, which proved to be the most active hurricane season, Jamaica, Trinidad and Tobago, Nicaragua and Panama received payouts totaling USD 21.9 million.<sup>207</sup> Currently, CCRIF SPC provides its members with over USD 500 million in joint reserves and claims-paying capacity, backed by international reinsurance.<sup>208</sup>

**Insurance has been evolving and can potentially play a greater role in DRR.** In the Caribbean, parametric insurance primarily addresses catastrophes related to hurricanes and

---

<sup>199</sup>UNDRR. 2021. Policy Brief: Financing Prevention and De-Risking Investment. Available online at: [https://globalplatform.undrr.org/sites/default/files/2022-04/UNDRR\\_Policy\\_Brief\\_Financing\\_prevention\\_and\\_de\\_risking\\_investment\\_FINAL%20%281%29.pdf](https://globalplatform.undrr.org/sites/default/files/2022-04/UNDRR_Policy_Brief_Financing_prevention_and_de_risking_investment_FINAL%20%281%29.pdf)

<sup>200</sup>Sustainable Hospitality Alliance. Climate Action. Available online at: <https://sustainablehospitalityalliance.org/our-work/climate-action/>

<sup>201</sup>Nalau, J., McNaught, R., Dalesa, M. 2020. Vanuatu in A Pacific Disaster Prevention Review, edited by Paul Barnes. Australian Strategic Policy Institute. Available online at: <http://www.jstor.org/stable/resrep25128.5>

<sup>202</sup>UNDP. 2018. Independent Review of the "Strengthening Disaster Risk Management in Papua New Guinea Project. Available online at: <https://erc.undp.org/evaluation/documents/download/13792>

<sup>203</sup>UNFCCC. 2020. A Threat and a Solution: Tourism's Role in Mangrove Protection. Available online at: <https://climatechampions.unfccc.int/a-threat-and-a-solution-tourisms-role-in-mangrove-protection/>

<sup>204</sup>CCRIF. Who We Are. Available online at: [https://www.ccrif.org/?language\\_content\\_entity=en](https://www.ccrif.org/?language_content_entity=en)

<sup>205</sup>ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries' Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)


<sup>206</sup>World Bank. 2022. Risk Insurance Builds Climate and Disaster Resilience in Central America and the Caribbean. Available online at: <https://reliefweb.int/report/world/risk-insurance-builds-climate-and-disaster-resilience-central-america-and-caribbean>

<sup>207</sup>Ibid.

<sup>208</sup>Ibid.

and earthquakes, and has been adapting to address other events. Under the Caribbean Oceans and Aquaculture Sustainability Facility (COAST) initiative, for instance, mixed model insurance is offered covering livelihood protection, along with protection from tropical cyclones. There are also plans to provide protection against drought.<sup>209</sup>

### **Notable Example**



Jamaica is seeking to address disaster financing gaps through a World Bank issued catastrophe bond. In collaboration with US, UK and German development partners, USD 185 million worth of insurance coverage exists for three hurricane seasons. Payouts are triggered if a storm passes through one of the 19 areas determined on a modelling map, allowing Jamaica to access funds relatively quickly. (World Bank, 2021)

Similarly, the Pacific Islands Climate Change Insurance Facility (PICCIF) and the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI), established in 2013, are important financial instruments. The diversified portfolio helps countries to pool the risk, while the pay-out limit functions as an incentive for countries to invest in risk reduction.

### **Key Message**

Risk transfer cannot substitute instruments that finance the reduction of existing risk and the prevention of new risk. International financial institutions, development banks, and the private sector should focus on DRR financing instruments that include risk reduction and prevention bonds, blended financing tools, pooled funds, guidance and methodologies to include DRR in decisions of business and institutional investors. Central banks and credit rating agencies should align strategies and operations with the Sendai Framework to ensure that they prioritize risk reduction for SIDS.

### **Challenges with Insurance**

**Risk insurance facilities needs external support to deliver on commitments.** In the case of the CCRIF, World Bank provides co-financing from a multi-donor Trust Fund (MDTF).<sup>210</sup> Through the CCRIF MDTF, the World Bank has provided grants equivalent to USD 23,750,000. Funds for the MDTF are leveraged through the European Union, Canada, the United States, Federal Republic of Germany and the Global Facility for Disaster Reduction and Recovery (GFDRR).<sup>211</sup> **This requires complex negotiations and arrangements.**

Further, **self-insurance- sovereign wealth funds, disaster funds, and/or stabilization funds that countries invest in may not be sufficient to address severe disasters.** Insurance by smaller entities for personal and business property may offer premiums that are too high for people to afford, and micro insurances may not be able to finance the cost of destruction from severe hazards. Even **for the emergency facilities that currently exist, SIDS' capacity constraints prevent them from accessing them easily.**<sup>212</sup>

The current approach to funding disaster risk reduction is lagging behind the rapid rate of creation and increasing complexity of disaster risk. It is inadequate for the implementation of multi-hazard, prevention-oriented disaster risk reduction strategies and remains focused on reactive measures, such as contingency funds, insurance and catastrophe bonds to finance post-disaster response and recovery.

CAT Bonds and other risk transfer mechanisms do not cover the full cost of disaster recovery and rehabilitation, and cannot keep up with the rising tide of economic losses due to disasters. Risk financing or transfer is but one layer in the comprehensive approach for financing prevention. Disaster risk reduction financing requires a multi-layered approach that blends ex-ante and ex-post financing.

---

<sup>209</sup>Ibid.

<sup>210</sup>Ibid.

<sup>211</sup>World Bank. 2022. Risk Insurance Builds Climate and Disaster Resilience in Central America and the Caribbean. Available online at: <https://reliefweb.int/report/world/risk-insurance-builds-climate-and-disaster-resilience-central-america-and-caribbean>

<sup>212</sup>OECD. 2021. The Impact of the COVID-19 Crisis on External Debt in Small Island Developing States. Available online at: [https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states\(SIDS\).pdf](https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states(SIDS).pdf)

There is an urgent need for international financial institutions and development banks, as well as the financial sector, to focus on the development of disaster risk reduction financing instruments. Such instruments can include risk reduction and prevention bonds, blended financing tools and pooled funds, as well as guidance and methodologies to include disaster risk reduction in decisions of business and institutional investors. Central banks and credit rating agencies can also align their strategies and operations with the Framework to ensure that they prioritize risk reduction.

Monetary authorities can also promote investments in risk reduction and resilience through regulations attached to lending streams. Development partners, international financial institutions, and development banks are called upon to support this by aligning their strategies and operations, with the Sendai Framework and national disaster risk reduction strategies.

### **Community Financing and Micro-Finance**

In some cases, micro-financing can be established to support vulnerable communities who face challenges in accessing funds in the aftermath of a disaster. **Microfinancing for DRR in SIDS largely remains at the nascent stage and is supported by larger financial institutions or development partners.** There are opportunities for growth, especially if microfinance institutions become a part of DRR networks and establish channels to track and disseminate disaster warning information, link with relief organizations, donors, and financial institutions.<sup>213</sup>

To date, **micro-finance mechanisms have been used at a very low scale in the Caribbean.** Under a pilot project funded by the Climate Investment Funds in Jamaica, loans were provided to rural communities at lower rates for adaptation activities, through partnership with the Inter-American Development Bank (IDB) to the Ministry of Economic Growth and Job Creation and the Planning Institute of Jamaica to provide adaptation lines of credit to financial institutions. These would then provide funds to rural communities.<sup>214</sup>

The Climate Risk Adaptation and Insurance in the Caribbean (CRAIC) Project is a similar initiative, designed to strengthen livelihood protection policies and provide loan portfolio cover to risk-exposed lending institutions. The project is funded by Germany's Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety under its International Climate Initiative and implemented by the Munich Climate Insurance Initiative.<sup>215</sup> Under this initiative two index-based micro-insurance products were launched in Grenada, Jamaica and Saint Lucia, with planned expansion to Belize and Trinidad and Tobago.

There are also smaller community funds available and supported through donor financing. The Small Grants Programme (SGP) under the GEF, for instance, supports NGO and CBO-based initiatives that focus on adaptation and resilience-building. Another example is the Canada Caribbean DRM Fund, which supports small scale-projects by community groups, for gender-sensitive projects with DRR benefits for low-income and rural communities.<sup>216</sup>

However, community-based financing is fairly small-scale and currently depends heavily on international support. The same challenges identified in Section 3.1, exist with complicated grant applications and the use of limited personnel to understand and facilitate application processes and financing.



Photo: UN Photo/Sophia Paris

<sup>213</sup>Kumar, T.S. & Newport, J. 2005. Role of Microfinance in Disaster Mitigation. Disaster Prevention and Management. 14. Available online at: [https://www.researchgate.net/publication/235309973\\_Role\\_of\\_Microfinance\\_in\\_Disaster\\_Mitigation/citation/download](https://www.researchgate.net/publication/235309973_Role_of_Microfinance_in_Disaster_Mitigation/citation/download)

<sup>214</sup>CIF. 2018. Microfinance for Climate Adaptation: From Readiness to Resilience. Available online at: <https://caribppcr.org.jm/wp-content/uploads/2018/06/MICROFINANCE.pdf>

<sup>215</sup>ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries' Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)

<sup>216</sup>Ibid.

### 3.3 Innovative Financing

#### Summary Box-Innovative Financing

- Current DRR financing has limitations, which requires innovative financing solutions; blue bonds, green bonds, debt swaps and blended finance offer opportunities.
- Nature-based solutions are an integral part of DRR. In the post-2020 Biodiversity Framework context, there is an opportunity for SIDS to highlight the relevance of DRR to biodiversity protection and natural resources management and vice versa.
- Funds made available through biodiversity financing windows should be open to DRR financing for an integrated approach to sustainable development.
- Despite innovative financing approaches challenges remain: (i) DRR requires political finessing to appear as an investment that can prove profitable in the future; (ii) innovative tools still require backing from other institutions that can guarantee loans; (ii) processes to secure innovative loans requires complex negotiations that could take years.
- Novel financing arrangements should include the following considerations for SIDS:
  - Decreasing dependence on short-term projects
  - Supporting links between DRR and biodiversity protection, or DRR and climate change adaptation to increase windows for DRR financing. Measurable DRR indicators should be established in such funding so countries can monitor DRR results.
  - Encouraging SIDS-specific financing arrangements with recognition of proneness for disaster

Given SIDS unique circumstances such as high levels of indebtedness, dependence upon external financing, and exposure and vulnerability to increasing natural hazards, there is the need for more innovative forms of financing. **The current donor culture has limitations, which prevent the optimization of resources and limit access of financing to all SIDS.**

#### Blue Finance

SIDS can potentially leverage the vast ocean resources they govern. **'Blue finance'** is a socially responsible form of investing, which can benefit coastal zones, biodiversity, ocean resources, and can positively support climate adaptation,<sup>217</sup> and can potentially be leveraged to finance DRR activities.

Seychelles has swapped some of its debt in exchange for designating nearly a third of its ocean territory as marine protected areas. In 2018, Seychelles launched the world's first sovereign blue bond, mobilizing USD 15 million for blue economy projects supporting sustainable marine and fisheries projects.<sup>218</sup> The purpose of the bond is also to strengthen Seychelles' resilience to climate change through the promotion of sustainable fisheries with an ecosystem-based adaptation approach.<sup>219</sup> Fiji will also be launching its Sovereign Blue Bond in 2022 to attract finance to deliver blue jobs and projects across its 1.3 million square kilometers of Blue Pacific.<sup>220</sup> This illustrates one of the ways that countries can leverage their natural endowments and be compensated for preserving ecological resources.

As the area of blue financing further develops, it would be useful to examine how DRR can be better embedded into natural resource protection, integrated coastal zone management, and biodiversity conservation. There are nature-based solutions such as

---

<sup>217</sup>World Bank. 2022. Sovereign Blue Bond Issuance. Available online at: <https://www.worldbank.org/en/news/feature/2018/10/29/overeign-blue-bond-issuance-frequently-asked-questions>

<sup>218</sup>World Bank. 2018. Seychelles launches world's first sovereign blue bond. <https://www.worldbank.org/en/news/pressrelease/2018/10/29/seychelles-launchesworlds-first-sovereign-blue-bond>

<sup>219</sup>Ibid.

<sup>220</sup>UNCDF. 2021. COP 26- United Kingdom, UN Agencies, Welcome Fiji's Plans to Issue Sovereign Blue Bonds in 2022. Available online at: <https://www.uncdf.org/article/7298/cop26-united-kingdom-un-agencies-welcome-fijis-plans-to-issue-sovereign-blue-bonds-in-2022>

mangrove restoration, wetland protection, and reforestation, which can mitigate vulnerability and exposure to hazards such as flooding, storm surges and violent waves, particularly as ecosystem-based approaches have been identified as a tool for disaster risk reduction. Healthy ecosystems are seen as having the potential to (i) Reduce physical exposure to hazards by serving as protective barriers or buffers and so mitigating hazard impacts, including in wetlands, forests and coastal ecosystems; and (ii) Reduce socioeconomic vulnerability to hazard impacts. In addition to protective and hazard regulatory functions of ecosystems, the strengthening of ecosystem services also sustain human livelihoods and provide essential goods such as food, fibre, medicines and construction materials, which strengthen people's resilience to disasters.<sup>221</sup>

### Green Bonds

Green bonds are further instruments that can improve DRR financing for SIDS and are designed to invest in environmental and climate change related projects, while ensuring profitable returns on investment.<sup>222</sup> Fiji's first green sovereign bond (FSGB), for instance, provided resources for DRR. Some of the funding from FSGB supported the construction and rehabilitation of schools to be used as evacuation sites during extreme climate events. The Green Bond also funded emergency road works and drainage facilities to render them more resistant to flooding, thus reducing risk and building resilience.<sup>223</sup> As it was noted in the first impact report of the FSGB, the bond demonstrates that "there are new financing solutions that can mobilise climate monies at unprecedented scale and support coastal protection".<sup>224</sup>

As investors seek to diversify their investment portfolios towards sustainable development investments—this creates opportunities to mainstream DRR within adaptation and

biodiversity friendly activities. For instance, in Saint Lucia, in partnership with the World Economic Forum's Sustainable Development Investment Partnership (SDIP), the Country Financing Roadmap (CFR) for the SDGs was initiated in 2020. This is a country-led initiative to develop an action plan for greater financing towards achieving Sustainable Development Goals (SDGs) through public-private collaboration. SDIP is a joint initiative of the World Economic Forum and the OECD, with a mission to address the systemic challenges to SDG financing and address vulnerability to climate change, disasters including those caused by external shocks.<sup>225</sup>

### Debt-Swaps

Given the level of indebtedness of SIDS, debt-swaps are potential financial instruments that can support DRR measures. Under such arrangements, debtor nations would make payments in the local currency to finance adaptation projects; in exchange multilateral or bilateral debt would be forgiven by creditors.<sup>226</sup> Belize, for instance, has signed the largest debt-for-marine-conservation deal allowing it to increase its coastal biodiversity protection zones from 15.9 % to 30 % by 2026. Belize must also commit to spend USD 4 million a year and fund a USD 23 million marine conservation trust to protect the world's second-largest coral reef.<sup>227</sup>

### Key Message

Nature-based solutions are an integral part of DRR. In the post-2020 Biodiversity Framework context, there is an opportunity for SIDS to highlight the relevance of DRR to biodiversity protection and natural resources management. Funds made available through biodiversity financing windows, should be open to DRR financing for an integrated and risk-informed approach to sustainable development.

<sup>221</sup> CBD. The Ecosystem-Based Approach Has Been Recognized as An Important Strategy for Disaster Risk Reduction. Available online at: <https://www.cbd.int/article/biodiversityagainstclimatechange-1#:~:text=Examples%20of%20ecosystem%2Dbased%20disaster,ecosystems%20to%20complement%2C%20protect%20and>

<sup>222</sup> Queen's University. How Green Bonds Work. Available online: <https://smith.queensu.ca/insight/content/how-green-bonds-work.php>

<sup>223</sup> Government of Fiji. 2018. Fiji Sovereign Green Bond: Impact Report. Available online at: <https://fjiclimatchangeportal.gov.fj/wp-content/uploads/2021/12/Fiji-Sovereign-Green-Bond-Impact-Report-2018-FINAL.pdf>

<sup>224</sup> Ibid.

<sup>225</sup> WEF/EU/DANIDA. 2021. Country Financing for the SDGs: Saint Lucia, Insight Report. Available online at: [https://www3.weforum.org/docs/WEF\\_Country\\_Financing\\_Roadmap\\_for\\_the\\_SDGs\\_Saint\\_Lucia\\_2021.pdf](https://www3.weforum.org/docs/WEF_Country_Financing_Roadmap_for_the_SDGs_Saint_Lucia_2021.pdf)

<sup>226</sup> Thomas, A., Theokritoff, E. 2021. Debt-for-climate swaps for small islands. In Nat. Clim. Chang. 11. Available online at: <https://www.nature.com/articles/s41558-021-01194-4#citeas>

<sup>227</sup> Reuters. 2021. Analysis: Belize Offers Ocean Blueprint with Debt for Reef Swap. Available online at: <https://www.reuters.com/business/cop/belize-offers-ocean-blue-print-with-debt-for-reef-swap-2021-11-05/>

It is apparent that SIDS need more innovative finance, which could include combinations of grants, debt swaps, green and blue bonds, and disaster clauses in debt contracts, and blended finance.<sup>228</sup> As focus on innovative financing grows, it is essential to include DRR as a key consideration within the criteria of financing. Some of the key considerations for innovative financing for SIDS should include:

- Leveraging resources that SIDS have—terrestrial ecosystems, marine resources, global biodiversity hotspots, endangered species and natural endowments.
- Decreasing dependence on short-term projects—the amount of time and effort it takes to negotiate complex debt swap deals warrants a long-term plan.
- Clearly identifying the links between DRR and biodiversity protection, sustainable land management, poverty eradication, debt management, or DRR in climate change adaptation to increase financing windows for DRR. Measurable DRR indicators should be included in financing packages so DRR interventions can be monitored.
- Increasing relevance of DRR for investments and highlighting profitability of DRR interventions.
- Pushing for SIDS-specific financing arrangements: proneness to disaster must be a consideration.

### Challenges with Innovative Financing Tools

Despite these innovative financing tools, blue finance is still in its infancy. While green bonds are valued at around USD 2 trillion<sup>229</sup>, blue finance is still relatively new and there many angles to explore to identify how marine resources can be leveraged to serve greater DRR. Part of the challenge is framing DRR as salient an issue as climate adaptation or biodiversity protection. **DRR will have to be demonstrated as an investment that can provide more in the future, and this requires political finessing.**

The other challenge with these innovative tools, are **that they require backing from other institutions that can guarantee loans.** In the case of Belize, The Nature Conservancy (TNC) established a financing vehicle and used funding from Credit Suisse to provide a loan to Belize to buy back its debt. The USD 200 million debt relief

to be provided by this loan is guaranteed by U.S International Development Finance Corporation (DFC) who has a top credit rating.<sup>230</sup> The combination of an international NGO with various financial and investor institutions requires complex architecture. It also suggests that given credit issues that SIDS face, they have to depend on other partners for access.

Based on the aforementioned, novel financing arrangements should include the following considerations for SIDS:

- Decreasing dependence on short-term projects
- Supporting links between DRR and biodiversity protection, or DRR and climate change adaptation to increase windows for DRR financing. Measurable DRR indicators should be established in such funding so countries can monitor DRR results.
- Encouraging SIDS-specific financing arrangements with recognition of proneness for disaster
- Simplifying financial arrangements as much as possible: potentially developing SIDS-specific financing templates
- Identifying a roster of SIDS-friendly investors whose requirements are streamlined and not onerous for SIDS' limited staff



Photo: UNDRR

<sup>228</sup>IISD. 2022. Report of the Main Proceedings from May 26th. Available online at: <https://enb.iisd.org/global-platform-disaster-risk-reduction-gp2022-daily-report-26may2022>

<sup>229</sup>Howell, J. 2022. Green bonds are big business for climate investors. GreenBiz. Available online at: <https://www.greenbiz.com/article/green-bonds-are-big-business-climate-investors#:~:text=To%20date%2C%20the%20global%20green,the%20total%20is%20%24313%20billion>

<sup>230</sup>IISD. 2022. Report of the Main Proceedings from May 26th. Available online at: <https://enb.iisd.org/global-platform-disaster-risk-reduction-gp2022-daily-report-26may2022>

## 4. Capacity Gaps

### Summary Box- Human Resources

Limited job opportunities, challenges in retaining skilled staff, and small populations from which to draw expertise result in a limited number of qualified staff working in key capacities.

Spatial dispersion means high service provision costs, challenging the ability of government to provide job opportunities. The impact of limited human resources results in:

- Less staff available to apply for concessional financing; less availability to explore new partnerships and financing opportunities.
- Less staff available to manage and monitor projects and initiatives.
- Challenges in conducting stakeholder consultations and including marginalized and remote indigenous populations.
- Dependency on volunteers.
- Emphasis on recovery rather than risk reduction or prevention; Financing for risk reduction planning requires data, modelling, long-term planning, cost analyses, many of which may be difficult with limited staff, especially when confronted with recovery efforts.
- Challenges in processing and coordinating international aid and post-disaster efforts.
- Reliance on consultants, international agencies, and development organizations.

### 4.1 Human Resources

One of the most significant challenges that SIDS face in managing DRR initiatives, is the sheer shortage of personnel to do so. **Limited job opportunities, challenges in retaining skilled staff, lack of staff with varied skillsets, result in a limited number of qualified staff working in key capacities, particularly in the areas of procurement, financial management, project management and hydrometeorology.** In addition, in some SIDS geographic and spatial dispersion results in high service provision costs, challenging the ability of government to provide job opportunities<sup>231</sup> The lack of staff further constrains the ability of SIDS to manage multiple funding sources.

There are several implications of having small numbers of staff addressing both risk reduction planning and dealing with the aftermath; these include the following:

**Less staff available to apply for concessional financing; less availability to explore new**

**partnerships and financing opportunities.** A limited number of personnel indicates that there is less time availability to explore or design innovative financing solutions, which require negotiations, exploration of market options, complex knowledge of investment options and investor demands, and the ability to provide the data required to substantiate proposals. Access to funds requires different processes to be underway simultaneously which can be taxing for small staff and timing of initiatives.

**Less staff available to manage projects and initiatives.** This creates a limitation on how many projects can be implemented at a time. As a result, countries may end up with few short-term projects, rather than multiple, cross-supportive baseline of projects which can be implemented in multiple sites, and reach greater geographic and stakeholder breadth. Negotiations and packages with multiple donors create burdens of reporting.

**Challenges in conducting stakeholder consultations and including marginalized and remote indigenous populations.** With less resources available and the high cost of travel and management, project, NDMO, or other government agency staff may have difficulty reaching various parts of the country. This may limit the inclusion of indigenous, marginalized and more remote communities.

**Dependency on volunteers.** In a number of SIDS, volunteers are a core part of DRR efforts; they play a key role in early warnings, risk detection, and implementation and coordination of recovery activities. However, there is a high turnover of volunteers, an associated cost of retraining and there may be inconsistency in quality of volunteers or time they can allocate to non-paid activities. Countries such as Kiribati have dealt with their personnel shortage by working collaboratively with NGOs such as the Red Cross.

**A focus on recovery rather than risk reduction or prevention.** Financing for risk reduction planning requires data, modelling, long-term planning, cost analyses, many of which may be difficult with limited staff, especially when confronted with recovery efforts.

---

<sup>231</sup>OECD/World Bank/GFDRR. 2016. Climate and Disaster Resilience Financing in Small Island Developing States.

Available online at:

<https://documents1.worldbank.org/curated/en/626571492596854843/pdf/114389-WP-v2-PUBLIC-CDRFinSIDS-20170208-webversion.pdf>



### **Challenges in processing and coordinating international aid and post-disaster efforts.**

Processing and managing aid inflows take resources and staff time. As was noted in Vanuatu in the post-Tropical Cyclone Pam context, national structures were not sufficiently staffed to manage the influx of international aid.<sup>232</sup> The tasks of coordination and information management with various agencies, the Prime Minister's Office, the Council of Ministers, the Development Committee of Officials, donors, the National Disaster Committee, the Vanuatu Humanitarian Team (VHT), government ministries (particularly Foreign Affairs), municipal councils, Provincial Disaster Committees, Community Disaster and Climate Change Committees, national clusters and regional and international agencies—all had to be managed through the NDMO which had difficulty carrying out so many roles with little personnel.<sup>233</sup>

### **Reliance on consultants, international agencies, and development organizations.**

The limitations of national staff and volunteers may result in higher dependency on consultants and international partners. While collaborations are needed and beneficial, there are also risks of ad hoc consultant participation. In some cases, consultants may not have the cultural knowledge and sensitivity to work with populations. As was noted in Vanuatu, in the recovery period following Tropical Cyclone Pam, new volunteers, private sector actors, and international NGOs emerged in the recovery phase. While some worked through appropriate government channels to reinforce national actions, others did not. The influx of new actors posed coordination challenges, increased cultural tensions, and some consultants demonstrated cultural insensitivity during their interactions. Resentment to consultants' limited understanding of the Melanesian context and culture, was noted within NGOs, UN agencies, coordination forums, and the government's own National Emergency Operation Centre (NEOC).<sup>234</sup> A reliance on international partners and consultants may also lessen country ownership

of interventions. Such frustration has also been noted in Haiti, where there has been a sentiment that aid interventions following the 2010 earthquake were mismanaged by international partners.<sup>235</sup>

Challenges to cross-sectoral approach to DRR—The issue of insufficient staff is not limited strictly to those working in national disaster agencies or hydrometeorological units. They are also relevant in tasks related to data collection and management and other associated sectors, such as health, education, and agriculture. Health workers are implicated both on the prevention and recovery ends of disasters, and have a key role to play in building human resilience. However, there are severe workforce challenges of shortages and inequities because of capacity constraints to produce, recruit and retain health workers in SIDS. There are large migratory outflows, particularly for specialized nurses and midwifery personnel, and there are also great challenges in the procurement of medicine and medical products. Health care is a high cost in SIDS due to small population sizes and limited domestic production of medicine.<sup>236</sup> This shows the staffing challenges inter-sectorally relative to DRR.



Photo: UN Photo/Rick Bajornas

<sup>232</sup> GIZ. Post-PAM: Lessons Learned for Development Cooperation in Vanuatu and the Pacific. Available online at: <https://www.adaptationcommunity.net/wp-content/uploads/2017/05/PostPam-Study.pdf>

<sup>233</sup> Ibid.

<sup>234</sup> Ibid.

<sup>235</sup> Gottesdeiner, L & Graham, D. 2021. Haiti quake revives anger over aid response to past disasters. Reuters. Available online at: <https://www.reuters.com/world/americas/haiti-quake-revives-anger-over-aid-response-past-disasters-2021-08-16/>

<sup>236</sup> WHO. 2021. SIDS Summit for Health: For a Healthy and Resilient Future in Small Island Developing States. Available online at: [https://cdn.who.int/media/docs/default-source/sids-summit/sids-health-systems-policy-brief.pdf?sfvrsn=b57828e8\\_5](https://cdn.who.int/media/docs/default-source/sids-summit/sids-health-systems-policy-brief.pdf?sfvrsn=b57828e8_5)

## 4.2 Capacity Gaps – Skills and Training

### Summary Box- Capacity Gaps: Skills and Training

Skills and capacity challenges observed in SIDS:

- DRR requires range of analytical expertise which may be difficult to attract and generate in SIDS.
- Significant loss of skills through emigration: “brain-drain”.
- Lack of alignment and/or partnerships between national DRR needs and tertiary education institutions.
- Low-level of baseline capacity.
- Limited capacity development opportunities.
- Low institutional capacity to provide concept notes and pass accreditation process of funding from donors.
- Low institutional capacity on numerical weather prediction.
- High cost of obtaining skills, training development for large numbers of staff.

In addition to limited staff and its implications, there is also the issue of availability of required skills to carry out the analysis required for DRR. SIDS suffer from lack of capacity and the following observations and challenges are noted in existing literature:

**DRR requires range of analytical expertise;** DRR-related data is complex, data-heavy, evidence-based—it requires various hydro-meteorological, but also communication and analytical skills to be able to tease relevant data into actionable policy decisions across sectors. The combination of skills required may be challenging to attract within the SIDS.

**Emigration - “Brain drain”-** There is a significant loss of skills from emigration noted particularly in the Caribbean and the Pacific SIDS. Higher wages, opportunities for advancement, potential for remittances from other countries may drive the loss of skills. This is again an example of compounding of vulnerabilities: economic vulnerability (need for improved employment, higher compensation or remittances) and small population (limited resources/human resources).

**Lack of alignment and/or partnerships between national DRR needs and tertiary education institutions.** There is a lost opportunity of leveraging the skills being obtained at universities and aligning them with the DRR needs of national institutions in some SIDS. In some cases, tertiary institutions offer certificate

programmes that may not meet the criteria or needs within national hydrometeorological or other institutions. It is also noted that there is not sufficient confidence/recognition of national trainings, preventing people from accessing positions in some SIDS, and the pressure is to get trained in foreign institutions. To strengthen capacity, higher levels of qualification, and greater communication with universities are needed to ensure that training programmes are aligned with institutional needs, and national institutions take advantage of the skills being generated. There are examples where universities have partnered specifically with governments to generate capacity and data, which could be replicated. In Trinidad and Tobago for instance, the Ministry of Planning and Development has partnered with the Seismic Research Center of the University of West Indies, which has developed a seismic microzonation analysis of the capital, Port of Spain, to incorporate the data and findings into its land-use planning and regulatory processes. This kind of focused research supports DRR planning and leverages the expertise in tertiary-level institutions.<sup>237</sup>

**Low-level of baseline capacity-** In some countries there is a shortage of capacities at the basic level of disaster management and governance. In Cabo Verde, 18 municipalities have no professional firefighters and rely exclusively on volunteers. The majority of first response organizations operate with staff which do not meet current requirements set by international standards for first response teams. Most organizations working on DRR in Cabo Verde do not have statutes formalizing their capacity requirements.<sup>238</sup>

Limited capacity development opportunities- There is also a challenge of functioning within a small office and providing training and advancement opportunities for staff. For many, personnel are executing several functions simultaneously and allocating time for trainings takes away from the other activities that need to be implemented. It has also been noted that foreign trainings often have gender

<sup>237</sup>ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries' Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/4/5990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/4/5990/S2000547_en.pdf)

<sup>238</sup>World Bank/GFDRR. 2020. Cabo Verde Emergency Preparedness and Response Diagnostic: Building a Culture of Preparedness.

requirements, which may mean that while females obtain trainings from SIDS, they may not be coming from the institution/ministry that is in most need of the capacity building—so people are being trained but not where skills are needed most.<sup>239</sup>

**Low institutional capacity to provide concept notes and pass accreditation process of funding from donors.** Applying for various financing sources requires specialized expertise—especially in cases where complex and innovative financing arrangements are being negotiated. As noted by an evaluation of the GCF, there is a lack of capacity to develop funding proposals and concept notes in SIDS. There are resource issues at play (having enough staff, cost of staff time, taking away from other priorities, cost of consultants), and capacity issues (technical knowledge, data/information gaps).

**Low institutional capacity on numerical weather prediction (NWP) and gaps in developing impact-based EWS-** Impact-based forecasting can assist with disaster risk management and building climate resilience. However, without impact data, there are gaps in implementing impact-based EWS. WMO has a series of initiatives such as the Severe Weather Forecasting Programme (SWFP), which makes NWP available based on global data, as well as the Flash Flood Guidance System (FFGS) and Coastal Inundation Forecasting Initiative (CIFI) which provides guidance on flash floods, wave surges and river flooding events.<sup>240</sup> However, some SIDS are lacking the capacity and human resources to integrate that data, or to map all the sources available and how best to utilize them. It is also useful to note that impact-based forecasting encounters challenges in developed countries as well—in New Zealand, for instance, there are concerns around the lack of impact

data, verification of warnings based on impacts, a conflict with roles and responsibilities, the potential for conflicting messages, and the increased burden on agencies providing information to forecasters with a perception of little benefit in return.<sup>241</sup> These challenges need to be considered while also considering the challenges of capacity, governance, and resources which already hamper SIDS.

**High cost of obtaining skills, training development for large numbers of staff**

### Education & Skills Development

Overall, there is a lack of expenditure for research and development in SIDS and low capacity to conduct research in the Natural Sciences, which leads to less domestically trained experts. There are very few scientific and technical articles produced by the SIDS—only 0.6 % of the global total in 2016.<sup>242</sup> As per regions, 0.07 % of scientific and technical studies were produced by Caribbean SIDS, 0.01 % by Pacific SIDS, and 0.51 % AIS, but when removing Singapore, that accounts for 0.02 %.<sup>243</sup>

SIDS have a need for more tertiary education in DRR relevant areas—increasingly on nature-based solutions, technical expertise, training, access to and applications of tools, new technology, ocean information, ocean literacy, monitoring networks, data products, and infrastructure and logistics, and human resource development, as well as the improvement of national research capacities, and the transfer of technology perspectives.<sup>244</sup> Technical cooperation and exchanges need to account for tertiary educational institutions' participation and potential impact within SIDS. Universities in SIDS can play greater roles in national capacity building activities, as generators of knowledge, sources of trained personnel, and hubs of innovation.

---

<sup>239</sup>AIS Workshop. July 7, 2022.

<sup>240</sup>WMO. 2022. Improving Warnings in the Caribbean, Pacific and SouthEast Asia. Available online at: <https://public.wmo.int/en/media/news/improving-early-warnings-caribbean-pacific-and-southeast-asia>

<sup>241</sup>Potter, S., Harrison, S., Kreft, P. 2021. The Benefits and Challenges of Implementing Impact-Based Severe Weather Warning Systems: Perspectives of Weather, Flood and Emergency Management Personnel. *Weather, Climate and Society*. Vol. 13, Issue 2. Available online at: <https://journals.ametsoc.org/view/journals/wcas/13/2/WCAS-D-20-01110.1.xml>

<sup>242</sup>Zitoun, R.; Sander, S.G.; Masque, P.; Perez Pijuan, S.; Swarzenski, P.W. Review of the Scientific and Institutional Capacity of Small Island Developing States in Support of a Bottom-up Approach to Achieve Sustainable Development Goal 14 Targets. *Oceans* 2020, 1, 109-132. <https://doi.org/10.3390/oceans1030009>

<sup>243</sup>Ibid.

<sup>244</sup>Zitoun, R.; Sander, S.G.; Masque, P.; Perez Pijuan, S.; Swarzenski, P.W. 2020. Review of the Scientific and Institutional Capacity of Small Island Developing States in Support of a Bottom-up Approach to Achieve Sustainable Development Goal 14 Targets. *Oceans*, 1, 109-132. <https://doi.org/10.3390/oceans1030009>

The Caribbean SIDS possess the highest tertiary institutional capacities and capabilities in SIDS regions, followed by the AIS and Pacific SIDS. Caribbean SIDS have the lowest percentage of total government expenditure on tertiary education, but they have the largest GDP per capita and the highest population of the three SIDS regions and thus a higher demand for institutional capacities.<sup>245</sup> Though the AIS SIDS have the lowest total population, they are ranked between Caribbean and Pacific SIDS, in part because of Singapore's investments, where education has been a key driver in economic development over the last decades.<sup>246</sup>

While creating opportunities for universities and learning centres to engage in biodiversity-related scientific cooperation, it is also necessary to support capacity development to promote retention of skills. One of the ongoing issues expressed by SIDS is the loss of skilled staff to other countries/institutions,<sup>247</sup> leaving countries in a continual state of knowledge deficit.

## Best Practices

The University of West Indies (UWI) plays a significant role in supporting Caribbean SIDS in DRR. The Disaster Risk Reduction Centre (DRRC) of UWI collaborates with the Caribbean Disaster Emergency Management Agency, and provides an integrated approach to training, research, and mobilization of experts as required by the Caribbean disaster risk management community.

Funded by Global Affairs Canada, DRRC has also developed courses at the MSc level to establish web-based graduate programmes and has managed the Enhancing Knowledge and Application of Comprehensive Disaster Management (EKACDM) project with stakeholders in the region. The DRRC also supports the Caribbean Disaster Information Network (CARDIN) library of disaster information, which provides resources to DRM practitioners.

## 4.3 Data and Technology Capacity Gaps

The Sendai Framework recognizes the essential need for technology and data and notes the "use and expansion of thematic platforms of cooperation, such as global technology pools and global systems to share knowhow, innovation and research and ensure access to technology and information on DRR" as a means

of implementing the Framework. The Sendai Framework further highlights the enhanced role for science, technology and innovation in modelling, early warning systems solutions, building resilient communities and the importance of increasing education and technical capacities in securing successful disaster resilience.<sup>248</sup> Innovative technologies can support DRR programmes to build awareness and participation at the local level, harmonize regional knowledge sharing frameworks and strengthen climate monitoring and national preparedness mechanisms.<sup>249</sup>

The Political Declaration of the Midterm Review of the SAMOA Pathway also notes: "We reiterate the need for improved data collection and statistical analysis, including high quality and disaggregated data, to enable small island developing States to better plan, monitor and evaluate the implementation of the SAMOA Pathway, the 2030 Agenda and the Sendai Framework Monitor."<sup>250</sup>

It is also further reinforced in the 2021 AOSIS Leaders' Declaration, which: "Reiterate[s] the need to provide enhanced support in developing national capacities for improved data collection and statistical analysis, including high-quality and disaggregated data, to enable SIDS to better plan, monitor and evaluate the implementation of the SAMOA Pathway, the 2030 Agenda and the Sendai Framework, with an emphasis on addressing the gap in data collection and analysis and the effective integration of the

<sup>245</sup>Ibid.

<sup>246</sup>Olds, K. 2007. Global assemblage: Singapore, foreign universities, and the construction of a "global education hub". *World Dev.* 35, 959–975.

<sup>247</sup>Zitoun, R.; Sander, S.G.; Masque, P.; Perez Pijuan, S.; Swarzenski, P.W. 2020. Review of the Scientific and Institutional Capacity of Small Island Developing States in Support of a Bottom-up Approach to Achieve Sustainable Development Goal 14 Targets. *Oceans*, 1, 109–132. <https://doi.org/10.3390/oceans1030009>

<sup>248</sup>ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries' Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)

<sup>249</sup>UNDP. 2017. Evaluation: "Strengthening resilience and coping capacities in the Caribbean through integrated early warning systems" Available online at: <https://www.undp.org/content/dam/rblac/docs/Research%20and%20Publications/Repository/Barbados/UNDP-RBLAC->

<sup>250</sup>UN. 2019. High-Level Political Declaration on the Midterm Review of the Samoa Pathway. Available online at: <https://www.un.org/pga/73/wp-content/uploads/sites/53/2019/08/SAMOA-MTR-FINAL.pdf>

economic, environmental and social dimensions of sustainable development".<sup>251</sup>

Knowing the risks of communities, infrastructure, livelihoods, assets, and the environment informs DRR measures.<sup>252</sup> However, assessing vulnerability and exposure of people, assets, communities and infrastructure networks to hazards requires data, analysis, the tools to collect the information, and human resources and capacity to process it. While many initiatives around traditional and alternative data collection and processing, such as using remote sensing or community mapping, have been piloted and scaled-up globally,<sup>253</sup> **SIDS suffer from weak data collection, technology constraints and access to adequate multi-hazard early warning systems.**<sup>254</sup> In order to reduce vulnerability and exposure and identify best practices and measures to reduce risks, SIDS require relevant data and access to technology which can inform planning processes. With large gaps in access and analysis of data, SIDS will not be able to optimize their DRR initiatives.

#### **4.3.1 Constraints in Data Generation and Analysis**

##### **Summary Box- Constraints in Data Generation and Analysis**

SIDS suffer from weak data collection, analysis, data-sharing, and application. The following are the key constraints in data generation, analysis and application:

- Difficulty in cross-sectoral data/information collection
- Lack of storage and access to data
- Lack of digitization of data
- Project-based culture creates disparate/disaggregated pools of information
- Data available is not standardized
- SIDS lack adequate downscaled climate data/projections
- Inadequate socioeconomic data to support trend analysis, impact analysis and general disaster risk management
- Lack of adequately skilled human capital to manage data technologies
- Lessons learned are not sufficiently updated and shared among countries
- Too many portals, databases, too much content or not usable portals
- Financing of Data—Risks of Privatization
- Not sufficiently leveraging data resources available through regional partners

Several constraints and challenges have been observed in SIDS in terms of data generation, retrieval, analysis and application, which limits risk-informed policy development and decision-making. To reduce risk and build resilience in SIDS, there is a need to connect the various pockets of information and data – such as science, geospatial data, statistics, policy interfaces,<sup>255</sup> along with indigenous knowledge and citizen science. The following represent some of the key constraints in data management within SIDS:

**Difficulty in cross-sectoral data/information collection-** every sector has its own mode of collecting data; comprehensive data collection and analysis portals for inter-sectoral use are lacking. Reasons for this challenge include: (i) siloed approach to generating and maintaining data—not sharing data; (ii) difficulty interpreting and utilizing certain databases cross sectorally; (iii) citizen and community approaches are not sufficiently used; (iv) indigenous knowledge is not sufficiently incorporated, appreciated or leveraged; (v) capacity does not exist at the institutional level to manage the information/data; (vi) technology is outdated, not maintained or non-compatible across sectors; (vii) national governments are driven by political pressures –they may not make unfavourable information or data public; (viii) staff/skills not available for information generation and analysis.

**Lack of storage and access to data-** Particularly in low-and middle-income SIDS, information is rarely managed and stored in ways that are easily accessible, or retrievable in a usable way. Because DRR is data-intense, the lack of access and storage is an impediment to making risk-informed decisions requiring accurate

<sup>251</sup>AOSIS. 2021. Leaders' Declaration 2021. Available online at: <https://www.aosis.org/launch-of-the-alliance-of-small-island-states-leaders-declaration/>

<sup>252</sup>ADB. 2020. Financing Disaster Risk Reduction in Asia and the Pacific. Available online at: <https://www.adb.org/sites/default/files/institutional-document/670596/financing-disaster-risk-reduction-asia-pacific.pdf>

<sup>253</sup>Ibid.

<sup>254</sup>UNDRR. 2021. SRSG Mizutori's Remarks at Early Warnings for Small Island Developing States-Bridging the Capacity Gap by 2030- COP 26 Side Event. Available online at: <https://www.undrr.org/news/srsg-mizutori-remarks-early-warnings-small-island-developing-states-bridging-capacity-gap>

<sup>255</sup>UN-ESCAP. Ocean Accounting for Disaster Resilience in the Pacific SIDS. Available online at: <https://drrgateway.net/disaster-risk-reduction/Ocean-Accounting-for-Disaster-Resilience-in-the-Pacific-Sids>

accurate measurements.<sup>256</sup> In the Maldives, precise data on damages and losses from the tsunami in 2004, for instance, is still lacking, which could provide a crucial baseline for future policy development.<sup>257</sup>

**Lack of digitization of data-** There is also the challenge of converting data from paper formats to machine readable, shareable formats. In some cases, historical data is collected on sheets of paper that are fragile in how they are maintained. In Samoa, there are records over 100 years on paper.<sup>258</sup> Without digitized form, this information cannot be shared with a wide array of stakeholders. This is also a pressing issue as increasingly DRR processes are relying on artificial intelligence (AI) and machine learning (ML) to generate everything from the forecasting of extreme events to the development of hazard maps and detection of events in real time.<sup>259</sup> The performance of ML or AI on a given task is dependent on the availability of quality data and selection of appropriate models. Without quality digitized baseline data, SIDS may not be able to optimize the technology resources accessible to them.

**Project-based culture create disparate/disaggregated pools of information-**

It is difficult to measure and consolidate what DRR investments are being made when there are multiple projects in place and reporting is made to donors rather than central institutions. For instance, if a project facilitates medical equipment or research, this may not be recorded by DRM agencies as DRR investment, even if could be used as such. There is thus a lack of coordination in managing information from individual projects. It was also noted in Trinidad and Tobago for instance, that it is challenging to have all sectors report on data for the Sendai Framework Monitor—the information that is eventually captured is only based on those sectors that were responsive.

**Data available is not standardized** which is an impediment to data sharing, collaboration and

exchange of tools, best practices, knowledge and expertise. There is at times a disconnect between those working in disaster management and ICT practitioners, policy makers, planners, researchers and technology-engaged stakeholders.

**SIDS lack adequate downscaled climate data/projections** which could help with modeling and predicting, and allow effective ex-ante DRR measures to be put in place. In Comoros and São Tomé and Príncipe, for instance, there is an absence of weather monitoring systems. This impedes the collection of data related to surface and groundwater supplies, which is necessary for water planning purposes and for DRR.<sup>260</sup>

**Inadequate socioeconomic data-** Socioeconomic data is required to support trend analysis, impact analysis and support general disaster risk management. Without this information, it is challenging to measure impacts of interventions on communities and to fully understand the scope of risk and vulnerability.

**Lack of adequately skilled human capital to manage data technologies-** as mentioned in the aforementioned section, small populations have limited human resources. This poses challenges to the number of people available to conduct data analysis and in particular cross-sectoral data analysis.

**Lessons learned are not sufficiently updated and shared among countries-** Many islands are piloting innovative tools, practices, and information generation practices to inform their DRR policies, investments, and programs. However, lessons learned and best practices are not sufficiently shared in usable ways among countries. Some of the databases collecting data are challenging to navigate and data is not easily displayed.

**Too many portals, databases, too much content or insufficient inter-operability of portals-** There is also the risk of too much data distributed across various portals and mechanisms making

---

<sup>256</sup> Donback, N. 2020. What We Can Learn From Disaster Risk Reduction Efforts from Small Islands. Available online at: <https://www.devex.com/news/what-we-can-learn-from-disaster-risk-reduction-efforts-in-small-islands-96072>

<sup>257</sup> UNDRR. 2019. Disaster Risk Reduction in Republic of Maldives. Available online at: [https://www.preventionweb.net/files/68254\\_682304maldivesdrmstatusreport.pdf](https://www.preventionweb.net/files/68254_682304maldivesdrmstatusreport.pdf)

<sup>258</sup> SPREP. Pacific Islands Meteorological Services in Action: A Compendium of Climate Services Case Studies. Available online at: [https://library.wmo.int/doc\\_num.php?explnum\\_id=3394](https://library.wmo.int/doc_num.php?explnum_id=3394)

<sup>259</sup> WMO. 2022. Artificial Intelligence for Disaster Risk Reduction: Opportunities, Challenges and Prospects. Vol.71 (1). Available online at: <https://public.wmo.int/en/resources/bulletin/artificial-intelligence-disaster-risk-reduction-opportunities-challenges-and>

<sup>260</sup> Kuruppu, N. & Willie, R. 2015. Barriers to reducing climate enhanced disaster risks in Least Developed Country-Small Islands through anticipatory adaptation in Weather and Climate Extremes Vol.7. Available online at: <https://www.sciencedirect.com/science/article/pii/S2212094714000504>

making it difficult to access the relevant information needed. In many cases, SIDS have noted that there is not a central database portal within their countries where all sectors can upload information in usable ways. The sustainability of data portals is also an issue. As was demonstrated under the Disaster Vulnerability Reduction Project in Grenada, while a successful database can be established, resources and capacities are required to sustain it, which may not be present.<sup>261</sup>

**Financing of Data—Risks of Privatization-** Given the challenges in mobilizing public resources for data production in SIDS, there is often the option of providing data for a fee to private sector. Aviation, shipping and tourism operators in the Caribbean, for instance, could be willing to purchase quality data. However, this raises a concern of data being available to privileged parties over others, further marginalizing those who may not have access to hydrometeorological information. There is also the risk that the government may unfairly privilege one private sector entity over another, and promote a non-competitive culture. Finally, there is the risk that private sector partners may then repackage and sell data for their own profit. This has been observed by some telecom companies in the Caribbean.<sup>262</sup>

**Not sufficiently leveraging data resources available through regional partners-** The three SIDS regions are rich in regional partners that can support data generation and capacity building exercises. The Caribbean Institute for Meteorology and Hydrology (CIMH) for instance, has been supporting SIDS for 55 years. The question that arises in SIDS, is whether there is sufficient application of this data to inform risk-informed policy-making, and integration across sectors. The utility of regional research centres may be underused due to a lack of capacity in the public service sector.

<sup>261</sup>CIF. 2021. Learning Review of CIF-Supported Hydromet and Climate Services Project. Available online at: [https://www.climateinvestmentfunds.org/sites/cif\\_enc/files/knowledge-documents/learning\\_review\\_of\\_cif\\_supported\\_hydromet\\_and\\_climate\\_services\\_projects.pdf](https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/learning_review_of_cif_supported_hydromet_and_climate_services_projects.pdf)

<sup>262</sup>Ibid.



## 4.4 Data and Information Needs

### Summary Box- Data and Information Needs

SIDS, generally, need improved access to the following kinds of data:

- Mitigating environmental threats
- Loss and damage
- Environmental Impact Assessments
- Down-scaled data
- Applied data
- Historical and baseline data
- Digitized data
- Socioeconomic data and hazard and vulnerability assessments
- Analysis of risks
- Risk-informed policy making
- Vulnerability/risk maps
- Indigenous knowledge
- Systemic risk and multi-hazard risk
- Investment potential of DRR

After exploring the challenges to access data, it is necessary to highlight the kind of information and data SIDS need for effective DRR. Generally, the types of data which SIDS need improved access to, include the following:

**Data on mitigating environmental threats** related to saltwater intrusion, floods, droughts, coastline erosion, loss of mangroves and terrestrial forests, coral reef submergence, loss of biodiversity and inhabitability of certain islands. In the context of disasters, often environmental threats are not measured as vividly as actual loss of infrastructure. However, these risks carry with them far-reaching consequences on the health, safety, agricultural production, food security and livelihoods of people.

**Data on loss and damage-** The costs of loss and damage, particularly from extreme events, can deplete national capital, put strains on limited national resources, and divert public funding.<sup>263</sup> Without understanding the scope of loss and damage, there is the challenge that countries

may not fully understand their DRR needs or risks, nor can they advocate for the resources they need to mitigate against this.<sup>264</sup> As noted in Trinidad and Tobago, there is a lack of data available on loss and damage. If someone wanted to inquire as to how many people lost lives as a result of a flooding event, this information is difficult to generate.

**Environmental Impact Assessments (EIA)-** Many SIDS are tourist havens, and house international resorts and hotels on vulnerable coastlines. While environmental impact assessments may be carried out, the risks of certain kinds of infrastructure and exposure to hazards is not always fully known. In the Maldives, EIAs for building resorts have no official guidelines or standard; they are not published for the public or local communities' review; sustainability is not a requirement; and post-construction monitoring is not conducted. This limits the kind of information that is available to DRR planners, especially as tourism is central to many SIDS' economies.

**Lack of down-scaled information-** Much of the hydro-meteorological data available is on a regional level, without the down-scaled level data that could inform local guidance communities of site-specific information. With climate change, micro-climate data and down-scaled data and measurement have become more essential. Observations suggest that tropical cyclone characteristics may differ at regional and local scales, and the added element of climate change may create more variations at the sub-national level that are difficult to predict.<sup>265</sup> Regional partnerships exist, in the AIS region for instance, Comoros, Mauritius and Seychelles rely on the South African Weather Service (SAWS) and on Météo-France (MF) in La Réunion for tropical cyclone forecasting, including marine-related hazards.<sup>266</sup> However, there is also the risk that down-scaled information may be lost. Local information is of particular relevance to early warning, flash flooding, civil protection, urban development, agricultural protection and food security, sanitation, improving lead-time accuracy and forecasting.

<sup>263</sup>IPCC. 2021. Small Islands in IPCC WGII Sixth Assessment Report. Available online at: [https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC\\_AR6\\_WGII\\_FinalDraft\\_Chapter15.pdf](https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_Chapter15.pdf)

<sup>264</sup>Ibid.

<sup>265</sup>Deo, A., Chand, S.S., McIntosh, R.D. et al. 2022. Severe tropical cyclones over southwest Pacific Islands: economic impacts and implications for disaster risk management. *Climatic Change* 172, 38. Available online at: <https://link.springer.com/article/10.1007/s10584-022-03391-2#citeas>

<sup>266</sup>WMO/CREWS. 2017. "Supporting regional cooperation to strengthen seamless operational forecasting and multi hazard early warning systems at national level in the South-West Indian Ocean": Project Presentation Note. Available online at: [https://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocrews/s3fs-public/ckeditor/files/South-West\\_Indian\\_Ocean\\_-\\_CREW\\_S\\_Proposal\\_3-final.pdf?OS7oFXrCT0Mp4\\_qGDppxuSFu3uCFReBB](https://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocrews/s3fs-public/ckeditor/files/South-West_Indian_Ocean_-_CREW_S_Proposal_3-final.pdf?OS7oFXrCT0Mp4_qGDppxuSFu3uCFReBB)



**Lack of applied data**—i.e., application of hydrometeorological data into agricultural production guidance, land-use planning, coastal zone management, infrastructure development, soil survey maps and other sectoral interests, is limited. In the case of earth observations, the capacity may be lacking to apply observations to measure impacts on populations or the environment. In Papua New Guinea, it is noted that there is a need to translate forecasts into recommendations for local farmers in planning for planting, harvesting, and fertilisation of their crops.<sup>267</sup> Similarly, inadequate application of GIS technologies for risk mapping and modelling is also a data gap.

**Lack of historical and baseline data**- Many SIDS may not have the baseline data that other countries have. Their reliance on international/regional hydrometeorological centres may mean that they do not have the historical inventories of data in-country. While they may have access to more advanced technologies now, SIDS may not be able to compare to a baseline and generate the kind of predictions or analysis they need. In some Pacific SIDS, baseline data collection during the 1980s and 1990s decreased, due to local meteorological services' struggle to resource observations,<sup>268</sup> which limits the accuracy of historical datasets. This is of course not the case in all Pacific SIDS; in Papua New Guinea, National Weather Service (PNG NWS) has long-established historical weather and climate datasets.<sup>269</sup>

**Shortage of Digital Data** - In some cases, historical data is collected on sheets of paper that are fragile in how they are maintained. In Samoa, there are records over 100 years on paper.<sup>270</sup> Digitizing this data will serve to better inform current technologies and application software and processes. It also leaves this data less vulnerable to loss and damage.

**Lack of socioeconomic data and hazard and vulnerability assessments** - Vulnerability assessments of social, economic and environmental factors underlying disaster risk drivers are lacking. Many SIDS have not been able to carry out extensive vulnerability assessments exposing their underlying disaster risk. This is of course, not the case in all SIDS. For instance, Fiji has piloted a climate and disaster vulnerability assessment and designed climate change adaptation and risk management plans and strategies, whose methodologies are available to share with other countries.<sup>271</sup>

**Lack of analysis of risks** - These are particularly needed to inform insurance and other forms of risk transfer and risk sharing mechanisms, contingency funds or contingent credit lines.

**Lack of hydrological products**, including current stream flow condition, ground water level and salinity, and seasonal water outlooks, which can be used as drought trigger, particularly in the Fiji, Papua New Guinea, Solomon Islands, Timor-Leste and Vanuatu.<sup>272</sup> In the Maldives, the predominant source of freshwater is groundwater, close to the surface, that is highly vulnerable to salination and other forms of pollution. This affects water quality, accessibility and use, and indicates that ongoing data needs to be generated to inform government policy, and private sector (particularly the tourism sector) of hydrological trends and risks.

**Data providing risk-informed policy** - Intersectoral data on: housing, land tenure and management, poverty, gender, urbanization patterns, demographic changes, institutional arrangements, risk-informed policies, regulation and incentive for private sector disaster risk reduction investment, supply chains, technologies, uses of natural resources, ecosystem, pandemics and epidemics, vulnerable communities etc. is sparse in SIDS

---

<sup>267</sup>SPREP. Pacific Islands Meteorological Services in Action: A Compendium of Climate Services Case Studies. Available online at: [https://library.wmo.int/doc\\_num.php?explnum\\_id=3394](https://library.wmo.int/doc_num.php?explnum_id=3394)

<sup>268</sup>Immarsat. 2022. Case study: NIWA and Inmarsat enable real-time weather monitoring across the Tonga archipelago in the South Pacific. Available online at: <https://www.inmarsat.com/en/insights/enterprise/2022/case-study-niwa-real-time-weather-monitoring.html>

<sup>269</sup>SPREP. Pacific Islands Meteorological Services in Action: A Compendium of Climate Services Case Studies. Available online at: [https://library.wmo.int/doc\\_num.php?explnum\\_id=3394](https://library.wmo.int/doc_num.php?explnum_id=3394)

<sup>270</sup>Ibid.

<sup>271</sup>World Bank/GFDRR. Climate Vulnerability Assessment: Making Fiji Climate Resilient. Available online at: <https://www.gfdr.org/en/fiji-climate-vulnerability-assessment>

<sup>272</sup>GCF. 2017. Enhancing Early Warning Systems to Build Greater Resilience to Hydro and Meteorological Hazards in Pacific Small Island Developing States (SIDS). Available online: <https://www.greenclimate.fund/sites/default/files/document/ppf-application-enhancing-early-warning-systems-build-greater-resilience-hydro-and-meteorological.pdf>

which would support more informed DRR initiatives.

**Vulnerability/risk maps-** identification of physical/geographic disaster risk zones; collection and analysis of bathymetric and topographic data; need for more ecological and socioeconomic impact assessments related to fisheries to provide improved data and climate-smart fisheries planning and decision-making are further needed in SIDS.

**Indigenous knowledge and data** - Indigenous knowledge and practices offer great potential for strengthening DRR but are often not incorporated into practices. Oral story-telling, observations can be lost if not recorded and institutionalized.

**Lack of data on systemic risk and multi-hazard risk-** interdependent and multi-dimensional variables of risk that are created by and magnified among different systems as they interact across geographic scales, is missing at this time. COVID-19 pandemic provides an entry point into viewing the interaction of risks and their cascading impacts across various sectors and systems in disasters.

**Lack of data on investment potential of DRR-** The investment potential of DRR remains understudied. While some countries such as the Seychelles and Saint Lucia have designed innovative financing arrangements, the overall potential of DRR remains unexplored. In particular, there is the challenge of convincing countries to invest in protection from disasters which may or may not occur. For the economic rationale, it is necessary for SIDS to generate data on the valuation and benefits of DRR initiatives.

## 4.5 Technology and Innovation

### Summary Box- Technology and Innovation

SIDS' access to technology and innovation has grown through projects, partnerships and technology investments.

However, SIDS generally require improvement of hydrometeorological hazard monitoring, forecasting infrastructure and technologies, an expansion of observing and monitoring networks, improvement of telecommunication systems, improvement of hydrological and meteorological data and related hazard data collection, storage, processing, management and transmission systems. Technologies and

systems for now-casting, such as radar systems and lightning detectors, to monitor moving severe weather events such as lightning, thunderstorms, heavy and intense rainfall, are also necessary as climate change increases frequency of heavy rains.

Some of the **barriers** that prevent SIDS from optimizing their access to technology resources are the following:

- Maintenance, upgrading, and asset deterioration
- Reliance on internet connectivity
- Logistical challenges
- Communications challenges
- Dependency on donors/Delays/Procurement challenges
- Financing limitations
- Dependency on regional hubs for technology and data
- Trainings and capacity building needed in tandem with technologies
- Obsolescence of technology
- Warranty of technologies
- Staff Retention
- Challenge in communicating data to end-users

When exploring challenges in accessing technology and innovation, a first challenge is the difficulty in gauging the level of technology access and innovation, due to a lack of data.<sup>274</sup> Access to DRR-related technologies have been increasing in SIDS, with many Pacific SIDS already applying various types of high-quality seasonal prediction information for their operational seasonal outlooks.<sup>275</sup>

There are also improved monitoring technologies in many SIDS. In Palau, UNDP has recently installed four automatic weather stations (AWS) to monitor weather conditions and provide real-time data, including wind speed and direction measurements, air temperature, humidity, solar radiation, rainfall intensity, and more.

<sup>274</sup> ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries' Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)

<sup>275</sup> Lee, YY., Kim, W., Sohn, S.J. et al. 2022. Advances and challenges of operational seasonal prediction in Pacific Island Countries. Sci Rep 12. Available online at: <https://www.nature.com/articles/s41598-022-15345-w>

The data will support local weather forecasting services, which are a key element of Palau's resilience to disasters.<sup>276</sup> Similarly, in Tonga, the National Institute of Water and Atmospheric Research (NIWA) supported the Tonga Meteorological Service (TMS) to install a network of automated weather and sea-level monitoring stations able to maintain connectivity, even during extreme weather events. During the tsunami triggered by the eruption of the Hunga Tonga–Hunga Ha'apai volcano in January 2022, only one weather station was damaged, while the others communicated data from some of the region's most remote and exposed islands.<sup>277</sup> There is also increasing access to satellite technology, which permits weather and sea level monitoring stations to provide near real time weather forecast information.<sup>278</sup>

Despite this, there are technology challenges that SIDS still face. The GCF has identified that SIDS in general require **improvement of hydrometeorological hazard monitoring, forecasting infrastructure and technologies, an expansion of observing and monitoring networks, improvement of telecommunication systems, improvement of hydrological and meteorological data and related hazard data collection, storage, processing, management and transmission systems.**<sup>279</sup> Technologies and systems for now-casting, such as radar systems and lightning detectors, to monitor moving severe weather events such as lightning, thunderstorms, heavy and intense rainfall, are also necessary as climate change increases frequency of heavy rains.<sup>280</sup>

Overall, the technologies required by SIDS can be captured under the following thematic areas: (i) observations and monitoring; (ii) data and information management; (iii) research-forecasting and modelling; (iv) service delivery and (v) training, capacity-building and accompaniment. Several projects and initiatives

have been put in place to address these technology gaps. In many countries with very small populations, it is necessary to obtain data from technologies from partners. With the project and technology support, which many SIDS receive from partners, the question is not just about having access to technologies, and rather studying the barriers that prevent the optimization of technology use for effective DRR interventions, and to identify what kind of technology is needed to fill the gaps in the development and implementation of a coherent DRR strategy.

In most SIDS, the primary challenge related to technology are the following:

**Maintenance, upgrading, and asset deterioration-** the cost of repair and software upgrades pose challenges for SIDS, especially given limited capacity and staff to address the issues. In Saint Lucia, maintenance is an issue because of high operational costs and resources. In Vanuatu, it was observed that plastic rain gauges could not be maintained due to high levels of humidity. This has been addressed by using metal gauges that are installed into the earth, however, reflects the challenges of upkeep in SIDS. Automatic weather stations can often fall into dis-repair, especially if they are on remote atolls or islands and there is not the human resource capacity to regularly check them. The challenge becomes critical when there is no financing plan for asset upgrading, creating risks to investments in technology. Under the Disaster Vulnerability Reduction Project in Dominica, it was noted that there is no plan for operational expenditure, no accounting for asset deterioration and no resources for maintenance of weather stations purchased by the project.<sup>281</sup>

**Reliance on internet connectivity-** In the Caribbean, there is a tendency to rely heavily on internet providers for early warning dissemination. This creates risk if there are any

---

<sup>276</sup>UNDP. 2022. New Automatic Weather Station to Enhance Palau's Climate Monitoring Capacities. Available online at: <https://www.undp.org/pacific/press-releases/new-automatic-weather-station-enhance-palaus-climate-monitoring-capacities>

<sup>277</sup>Immarsat. 2022. Case study: NIWA and Immarsat enable real-time weather monitoring across the Tonga archipelago in the South Pacific. Available online at: <https://www.immarsat.com/en/insights/enterprise/2022/case-study-niwa-real-time-weather-monitoring.html>

<sup>278</sup>Ibid.

<sup>279</sup>GCF. 2017. Enhancing Early Warning Systems to Build Greater Resilience to Hydro and Meteorological Hazards in Pacific Small Island Developing States (SIDS). Available online: <https://www.greenclimate.fund/sites/default/files/document/ppf-application-enhancing-early-warning-systems-build-greater-resilience-hydro-and-meteorological.pdf>

<sup>280</sup>Ibid.

<sup>281</sup>CIF. 2021. Learning Review of CIF-Supported Hydromet and Climate Services Project. Available online at: [https://www.climateinvestmentfunds.org/sites/cif\\_enc/files/knowledge-documents/learning\\_review\\_of\\_cif\\_supported\\_hydromet\\_and\\_climate\\_services\\_projects.pdf](https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/learning_review_of_cif_supported_hydromet_and_climate_services_projects.pdf)

disruptions to Global Systems for Mobile (GSM) services.<sup>282</sup> Section 4.6 highlights the vulnerability of the Pacific Islands to disruptions in connectivity and communications.

**Logistical challenges** in establishing monitoring systems in isolated areas where there is a lack of local travel infrastructure. In some cases, remote weather stations can be difficult to set up, maintain and travel to, especially if they are collecting observations at higher elevations, or in highly weather-vulnerable zones.

**Communications challenges-** Lack of the local terrestrial or IP cellular communications networks, which are disrupted during hurricanes and cyclones; outages of land-based communications can all limit early warnings to communities. SIDS also need reliable servers through which they can upload and disseminate information.

**Dependency on donors/Delays/Procurement challenges-** There is a dependency on donors for purchase of and installation of technologies such as automatic weather stations, as well as for training and accompaniment. If there are procurement challenges or delays on the donors' end, it impacts the realization of critical warnings within SIDS. For instance, in the Pilot Program for Climate Resilience implemented in Dominica, Grenada, Haiti, Jamaica, Saint Lucia and St. Vincent and the Grenadines, it was noted that delays in procurement of hydro-meteorological technology, along with disruption to shipments caused by Covid-19, slowed progress of the project in all six countries.<sup>283</sup> Specifications and requirements of technologies can also be difficult to fulfill within short project cycles, and any crises such as the pandemic, traveling restrictions or hurricanes/cyclones can exacerbate shipment delays. In some regions, there are multiple projects coordinated to support one another—a potential delay in one can have cascading effects on others.

**Financing limitations-** SIDS do not have the financial resources to purchase, install and apply technologies as needed, due to financial constraints. They are dependent upon an array of projects and donors, which they have to coordinate and align for optimal usage of technologies and data. Any change in financing means that SIDS have to forego technologies and associated services. In Dominica, under the Disaster Vulnerability Reduction Project, the number of weather stations were reduced from the initially planned 50, to 36 due to the lack of budget. Light detection and ranging (LIDAR) modelling, forecasting, and hydrological profile models, part of the project design were also removed due to budget constraints.<sup>284</sup> In the Caribbean and Pacific most countries do not have multi-hazard emergency management Information/ Management system that is accessible to all sectors, whose information can be used and applied for DRR planning. In the Pacific islands, technology is required to improve programmes and forecasting tools. Specifically, technologies such as AWS, weather radars, satellite products, and improvement of the upgrading of Numerical Weather Prediction models are need to strengthen resilience of Pacific SIDS.<sup>285</sup> With growing flood risks, many SIDS also require technologies to measure flood risk through wireless water level monitoring stations.

**Dependency on regional hubs for technology and data-** One of the challenges of receiving information on hydro-meteorological hazards from a regional centre, is that they do not uniformly impact countries, and that capacities, needs and priorities to respond to hazards may vary significantly across countries.<sup>286</sup> In the Caribbean, there is a reliance on the Pacific Tsunami Centre for tsunami alerts. There are also some SIDS that do not have access to regional hubs.

---

<sup>282</sup>GCF. 2017. Enhancing Early Warning Systems to Build Greater Resilience to Hydro and Meteorological Hazards in Pacific Small Island Developing States (SIDS). Available online: <https://www.greenclimate.fund/sites/default/files/document/ppf-application-enhancing-early-warning-systems-build-greater-resilience-hydro-and-meteorological.pdf>

<sup>283</sup>CIF. 2021. Learning Review of CIF-Supported Hydromet and Climate Services Project. Available online at: [https://www.climateinvestmentfunds.org/sites/cif\\_enc/files/knowledge-documents/learning\\_review\\_of\\_cif\\_supported\\_hydromet\\_and\\_climate\\_services\\_projects.pdf](https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/learning_review_of_cif_supported_hydromet_and_climate_services_projects.pdf)

<sup>284</sup>Ibid.

<sup>285</sup>Deo, A., Chand, S.S., McIntosh, R.D. et al. 2022. Severe tropical cyclones over southwest Pacific Islands: economic impacts and implications for disaster risk management. *Climatic Change* 172, 38. Available online at: <https://link.springer.com/article/10.1007/s10584-022-03391-2#citeas>

<sup>286</sup>GCF. 2017. Enhancing Early Warning Systems to Build Greater Resilience to Hydro and Meteorological Hazards in Pacific Small Island Developing States (SIDS). Available online: <https://www.greenclimate.fund/sites/default/files/document/ppf-application-enhancing-early-warning-systems-build-greater-resilience-hydro-and-meteorological.pdf>

**Trainings and capacity building needed in tandem with technologies-** Trainings are required to maintain capacity on how to best use and maintain technologies. Often the training period is short, and what may be needed is more ongoing support and accompaniment. There is also a need for hands-on training; this was demonstrated under the Dominica Disaster Vulnerability Reduction Project. However, because of the COVID-19 pandemic and Hurricane Maria, it was challenging to provide the in-person trainings required by hydrometeorological services.

**Obsolescence of technology-** There are constant upgrades and developments to technology, as well as transfers of outdated or non-environmentally friendly technologies. Aspects of certain technologies, like software, may become obsolete or may require re-training of staff. This is a barrier for SIDS that have challenges in procuring equipment and small staff to undergo capacity building exercises, and take time away from their daily work. Some technology trainings take place outside of countries, in larger regional hubs, this increases cost to train staff.

**Warranty of technologies-** One of the challenges of dependency on projects and donor-financed interventions, is that if there are procurement delays, warranties may run out on technologies before installation or training of personnel. This is especially the case if warranties are based on purchase dates rather than on installation dates. This was noted in the Dominica Disaster Vulnerability Reduction Project.<sup>287</sup>

**Staff Retention-** is also a barrier with regards to technology in that turnover means that the capacity to operate and analyze data from certain technologies may be lost.

**Communicating data to end users and service-** Most SIDS require improved and accurate forecasting, with the appropriate communication channels and messaging to disseminate to local populations, especially those that may be more remote or vulnerable (migrant populations, indigenous groups, the elderly, groups with disabilities, women and children, other linguistic groups). The end goal of technology is to produce the kind of information that will be understood and relevant to populations so that they may reduce their disaster risk, but sometimes “turf

wars” between disaster management and meteorological institutions can create communication gaps. While many countries have dramatically improved their communications (e.g., Fiji), there are some that still face challenges.

**Lack of digitalization-** Certain technologies can only be used with those technologies already in place, and with specific technologies from particular suppliers. A baseline of specific technology may be required to upgrade systems and benefit from technology transfer.

### **A snapshot of initiatives in the Pacific which facilitate access to technology resources**

- The iSTAR Automated Weather Station, is funded by the Finnish-Pacific (FINPAC) Project aimed at reducing the vulnerability of the livelihoods of Pacific islanders to the impacts of climate change through strengthening the Meteorological Services. Himawari- Japan’s geostationary meteorological satellites will be providing imagery to Pacific SIDS.
- Climate Risk Early Warning System (CREWS) Project intended to enhance the capacity of Pacific island countries, and strengthen hydro-met services to predict extreme and high impact hydro-meteorological events and associated risks to alert exposed populations
- Enhancing Climate Information and Knowledge Services for Resilience funded by the GCF, seeks to increase access to climate information and services in Cook Islands, Niue, Palau, the Republic of the Marshall Islands and Tuvalu.
- The Digital Earth Pacific Project, funded by the Pacific Community, Australian Aid and NOAA, will support a new analytics platform to leverage free environmental data amassed by scientists and earth observation satellites.
- RIMES is supporting Papua New Guinea to become a hub to provide advanced early warning to the Pacific region and establishing institutionalised interactive mechanisms such as a seasonal forum to provide forecast and early warnings. This centre will serve as national integrated Early Warning Centre that will serve also as the RIMES subregional hub for the Pacific. Once it is functional, it is

<sup>287</sup>CIF. 2021. Learning Review of CIF-Supported Hydromet and Climate Services Project. Available online at: [https://www.climateinvestmentfunds.org/sites/cif\\_enc/files/knowledge-documents/learning\\_review\\_of\\_cif\\_supported\\_hydromet\\_and\\_climate\\_services\\_projects.pdf](https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/learning_review_of_cif_supported_hydromet_and_climate_services_projects.pdf)

intended that 14 Pacific islands can get their information from this PNG centre.

- The Pacific Disaster Centre, supported by the University of Honolulu supports DisasterAWARE, an all-hazards global exposure model to enable anticipatory action during large-scale hazard events. The system also includes global early warning, hazard monitoring, and situational awareness for natural and manmade hazards in SIDS.

## 4.6 Infrastructure and Communications

### Summary Box- Infrastructure and Communications

- Remoteness, geographic dispersion, and dependency on few communications cables leaves SIDS highly dependent on existing infrastructure.
- Addressing vulnerability of communications systems is critical as hazards may cut SIDS off from other countries and resources, depriving populations of warnings, support and essential services
- Critical infrastructure such as transportation systems, power lines, pipelines, and reservoirs are at risk of natural hazards, and this is exacerbated by aging infrastructure, poor maintenance and reinforcement, and the establishment of telecommunications infrastructure in hazard-prone areas
- Reducing disaster risk must include cost-effective ways to future-proof new development and retrofit existing infrastructure to withstand current and emerging climate and disaster risks
- Cost–benefit analyses conducted for the Asia and Pacific region have shown ratios from 1:2 to as high as 1:55 in terms of the benefits from investing in disaster-resilient measures

Beyond the advanced and innovative technological tools needed to support effective

DRR in SIDS, there is also the reality that even basic infrastructure is at risk. Existing telecommunications infrastructure is extremely vulnerable to hazards in SIDS, such as flooding, landslides, hurricanes/cyclones and volcanic activity. Critical infrastructure such as transportation systems, power lines, pipelines, and reservoirs are at risk of natural hazards, exacerbated by aging infrastructure, poor maintenance and reinforcement, and the establishment of telecommunications infrastructure in hazard-prone areas.<sup>288</sup>

**SIDS are less than one third as well-connected as other developing countries.**



Communications infrastructure is crucial in SIDS due to remoteness and isolation. This is particularly the case for Pacific SIDS, which include some of the most remote countries in the world.<sup>289</sup> Addressing vulnerability of communications systems is thus critical as hazards may cut SIDS off from other countries and resources, depriving populations of warnings, support and essential services.<sup>290</sup> In Tonga, communication upgrades were made in 2013, with an 830-kilometre fibre-optic cable connecting Tonga to Fiji via the Southern Cross Cable, which links Australia, New Zealand, Fiji, Hawaii and the continental United States. In 2018, fibre-optic cable connectivity was extended from Tongatapu to the islands of Eua, Ha'apai and Vava'u. However, in 2019, the cable was accidentally severed, cutting Tonga off from critical communications. The maintenance crew closest to Tonga was located in Papua New Guinea; it took them 10 days to arrive at the site of repair. During this delay, the population did not have access to basic communications, demonstrating the vulnerability of the communication system, and the level of dependency on other states and actors.<sup>291</sup>

<sup>288</sup>ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries' Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)

<sup>289</sup>OECD. 2018. Making Development Co-operation Work for Small Island Developing States. Available online at: <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/OECD-SIDS-2018-Highlights.pdf>

<sup>290</sup>Petrova, D. & Dan, M.B. 2020. Natural Hazard Impacts on Technological Systems and Infrastructures in Nat. Hazards Earth Syst. Sci., 20. Available online at: <https://nhess.copernicus.org/articles/20/2627/2020/nhess-20-2627-2020.pdf>

<sup>291</sup>UNDRR. 2022. What the Tonga Disaster Tells Us About the South Pacific's Cyber Resilience. Available online at: <https://www.preventionweb.net/news/what-tonga-disaster-tells-us-about-south-pacifics-cyber-resilience>

While submarine cables are known to be damaged frequently and cause disruptions, the vulnerabilities of SIDS make them particularly susceptible to such breakdowns. **While other countries generally do not rely on a single line, Pacific SIDS are dependent on the very few trans-ocean cables, due to their remoteness.**<sup>292</sup>

The installation of submarine communication cables is a costly endeavour—the Tonga cable, described as a relatively short one, cost USD 28.6 million to install.<sup>293</sup>

These vulnerabilities were exposed during the 2022 volcano eruption in Tonga, which completely cut off domestic and international communications.<sup>294</sup> **The combination of remoteness coupled with other disasters demonstrates just how vulnerable basic communications infrastructure is in SIDS.** And communications are at the heart of early warnings when hazards are impending. For some SIDS spread across various islands, the internal communications infrastructure is critical. As noted by ECLAC, in the Caribbean, enhanced cooperation including formalized agreements and frameworks between the telecommunications sector and national disaster offices is necessary for more effective disaster response and recovery operations.<sup>295</sup>

The government of Australia is a major investor in Pacific submarine cables, seeking to improve connectivity for Pacific islands. USD 200 million has been invested by the Australians in the Coral Sea cable system connecting Sydney with the Solomon Islands and Papua New Guinea. Through the Australian Infrastructure Financing Facility for the Pacific, Australia announced additional co-funding for a cable connecting the Federated States of Micronesia, Kiribati, and Nauru, and for a second cable to be installed to Palau. Despite these investments, maintenance, repair and restoration capabilities must be invested in to optimize on such infrastructure. The isolation of the Pacific SIDS act as a

constraint in managing such investments—of the 60 cable-laying ships worldwide, there is only one operating in the relative proximity to the South Pacific.<sup>296</sup> This means that in case of damage or repairs, support is not readily available.

Beyond communications, transport infrastructure is also critical in SIDS, especially for shipping, dispersal of goods and services and reaching remote areas. In Fiji, the transport infrastructure plays a significant role in the country's economy and the sector contributes approximately 12 % to Fiji's GDP. The transport sector receives approximately 30 % of the government's capital budget, annually, and serves to connect urban, rural, and island communities. Efficient roads, bridges, jetties, maritime and aviation, are crucial to connect communities to social services and economic opportunities. Further, tourism and agriculture, two of Fiji's largest economic sectors, require efficient mobility, internal freight distribution, port facilities, shipping lanes, and access to island destinations. Yet transport infrastructure is vulnerable to increased rainfall intensities, sea-level rise, storm surges, and riverine flooding. Climate-related hazards increase washouts of low-lying and coastal roads and bridges; landslides on roads located on unstable soils; temporary network disruptions, and degradation of aging marine assets.<sup>297</sup>

Any means of implementation must thus address the sustainability of critical infrastructure. **Reducing disaster risk must include cost-effective ways to future-proof new development and retrofit existing infrastructure to withstand current and emerging climate and disaster risks.**<sup>298</sup> As noted by the ADB "Resilient infrastructure offers what has been coined a "triple dividend." The business case for resilience investments is compelling with an average USD 1 spent saving USD 4– USD 7 in response. Cost–benefit analyses conducted for the Asia

---

<sup>292</sup>Ibid.

<sup>293</sup>Ibid.

<sup>294</sup>Ibid.

<sup>295</sup>ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries' Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)

<sup>296</sup>UNDRR. 2022. What the Tonga Disaster Tells Us About the South Pacific's Cyber Resilience. Available online at: <https://www.preventionweb.net/news/what-tonga-disaster-tells-us-about-south-pacifics-cyber-resilience>

<sup>297</sup>Government of Fiji/GFDRR. Climate Vulnerability Assessment: Making Fiji Climate Resilient. Available online at: [https://www.gfdr.org/sites/default/files/publication/Making%20Fiji%20Climate%20Resilient%20-%20Full%20Report\\_0.pdf](https://www.gfdr.org/sites/default/files/publication/Making%20Fiji%20Climate%20Resilient%20-%20Full%20Report_0.pdf)

<sup>298</sup>ADB. 2020. Financing Disaster Risk Reduction in Asia and the Pacific. Available online at: <https://www.adb.org/sites/default/files/institutional-document/670596/financing-disaster-risk-reduction-asia-pacific.pdf>

and Pacific region have shown ratios from 1:2, to as high as 1:55, in terms of the benefits from investing in disaster-resilient measures.<sup>299</sup>

### **Key Message**

Reducing disaster risk must include cost-effective ways to future-proof new development and retrofit existing infrastructure to withstand current and emerging climate and disaster risks



## **5. Institutional Support**

### **Summary Box-Additional Institutional Constraints Preventing Successful Implementation of DRR**

- DRR is not politically salient in non-emergency times, and is often less politically engaging than climate change discussions; lack of political will to prioritize DRR
- Intersectoral mainstreaming of DRR remains a challenge
- DRR is often not perceived as central to sustainable development
- DRR is not just weather-related and needs to be rendered more relevant inter-sectorally
- Disaster management authorities often have no enforcement capacities
- Institutions may have low absorptive capacities for capacity building and data
- Unclear land tenure arrangements pose constraints to effective DRR
- Procurement delays at national levels can cause donors to finance NGOs or UN agencies for execution of DRR activities

## **5.1 Institutional Constraints Preventing Successful Implementation of DRR**

Financial constraints and capacity constraints have been explored in previous sections, but these can only be addressed if enabling conditions exist within SIDS. The absorptive capacity of country institutions, and what constraints they face in implementing effective DRR initiatives, other than those linked to financial resources, capacity, technology, skills and human resources that have already been reviewed, require attention.

### **DRR as part of Sustainable Development**

One of the primary issues that comes up when speaking to representatives from SIDS, is that of political will. There is often a sentiment that DRR is not perceived as salient an issue in non-emergency times, or as politically engaging as climate change adaptation. Climate change has become part of the common lexicon and can mobilize passions, civic engagement, and resources, which propositions for DRR are unable to equal. As a result, DRR's centrality to sustainable development is not institutionally enforced despite DRR being a means by which to support risk-informed development. Reducing underlying vulnerabilities to hazards within development pathways is a key component of disaster risk reduction.

Empirical evidence has demonstrated that disasters negatively affect state efforts to reduce poverty. The lack of risk reduction efforts can create vicious cycles of poor economic outcomes.<sup>300</sup> Sustainable development cannot be attained without preventing the creation of new and reducing existing disaster risk. This requires integrating disaster risk fully into development, to reduce all forms of vulnerability through clear national and local-level planning.<sup>301</sup>

This also requires strategic foresight capabilities to develop policymaking in the context of uncertainty to prepare for a variety of possible developments and support risk-informed decision-making.<sup>302</sup> SIDS need to consider future actions, strategic foresight, preparedness for

<sup>299</sup>Ibid.

<sup>300</sup>Lucatello, S. & Alcántara-Ayala, I. 2022. Addressing the Interplay of the Sendai Framework with Sustainable Development Goals in Latin America and the Caribbean: Moving Forward or Going Backwards? Available online at: <https://www.undrr.org/publication/addressing-interplay-sendai-framework-sustainable-development-goals-latin-america-andhttps://www.undrr.org/publication/addressing-interplay-sendai-framework-sustainable-development-goals-latin-america-and>

<sup>301</sup>Lucatello, S. & Alcántara-Ayala, I. 2022. Addressing the Interplay of the Sendai Framework with Sustainable Development Goals in Latin America and the Caribbean: Moving Forward or Going Backwards? Available online at: <https://www.undrr.org/publication/addressing-interplay-sendai-framework-sustainable-development-goals-latin-america-and>

<sup>302</sup>OECD. 2020. Strategic Foresight for the COVID-19 Crisis and Beyond: Using Futures Thinking to Design Better Public Policies. Available online at: <https://www.oecd.org/coronavirus/policy-responses/strategic-foresight-for-the-covid-19-crisis-and-beyond-using-futures-thinking-to-design-better-public-policies-c3448fa5/>



catastrophic risks, and anticipatory decision-making that leads to favourable development scenarios. There is the potential that this will be supported by the international community, as this is consistent with the recommendation in the UN Secretary-General's Report on Our Common Agenda, which notes: "We also need to be better prepared to prevent and respond to major global risks. It will be important for the United Nations to issue a Strategic Foresight and Global Risk Report on a regular basis, and I also propose an Emergency Platform, to be convened in response to complex global crises."<sup>303</sup>

### **DRR mainstreaming across sectors remains a challenge**

The Sendai Framework demonstrates alignment with sustainable development goals (SDGs)—risk reduction and resilience building as outlined in the Sendai Framework are key to the attainment of the 2030 Agenda. The manner in which countries report against the Sendai Framework, are complementary to reporting on SDG indicators. However, **many SIDS are unable to report inter-sectorally**, reflecting that DRR has not been mainstreamed across sectors as a central tenet to sustainable development. The fiscal revenue channelled to DRR, the relative independence of NDMOs and hydrometeorological agencies, and low staffing levels committed to DRR, indicate that more can be done to mainstream DRR. Unless and until this happens, projects and initiatives will not be able to deliver desired results, for DRR requires the engagement of all actors, and indeed all-of-society, for success.

### **It may be challenging to address disaster risk reduction due to its cross-sectoral nature.**<sup>304</sup>

Often there is a challenge of knowing which ministry should be managing what aspect of DRR, such as finance, civil protection, environment, public works, tourism, planning, agriculture, which are responsible for different elements that jointly influence risk reduction and resilience-building measures. Complex public finance regimes in some countries do not facilitate flow of funding into disaster risk

reduction measures, or an understanding of how the flows are divided. **There also needs to be improved monitoring of SIDS' specific expenditure for disaster risk reduction, including prevention.**

There are also resource issues that hamper certain government agencies or ministries, over others. In Fiji for instance, the Fiji Meteorological Services, the Seismology Section, and the Hydrology Division, all operate on a 24-hour basis. The NDMO is unable to do so, due to resource issues. This constrains the NDMO's ability to deliver timely early warning messages on a 24-hour cycle.<sup>305</sup>

However, as noted by ECLAC, "National governments have to find ways to integrate their development and DRM planning processes. DRM rests on five pillars: (i) risk identification, (ii) risk reduction, (iii) preparedness, (iv) financial protection and (v) resilient recovery. These pillars are closely interrelated and must be set within a conducive institutional, political, normative and financial environment that permits the allocation of the necessary resources and the appropriate definition of roles and responsibilities."<sup>306</sup>

### **DRR is not just weather-related**

DRR is often mis-perceived as being most relevant to extreme weather-events. This limits the responsive approach that can be taken to address exposure and vulnerability to hazards.

**While there is no doubt that SIDS are suffering from increased weather events, it is also necessary to view hazards such as oil spills, alien invasive species, health risks, waste management, pollution, sanitation issues, connectivity, and economic risks as relevant to DRR initiatives.** This multi-dimensional perspective on DRR will allow improved mainstreaming of the concept within other sectoral interests. COVID-19 has demonstrated the need for a more versatile view of systemic risk, and has showcased countries' abilities to respond quickly and regionally. The response to the pandemic offers promise that SIDS can mobilize quickly and inter-sectorally when needed.

<sup>303</sup>UN. 2021. Our Common Agenda- Report of the Secretary General. Available online at: [https://www.un.org/en/content/common-agenda-report/assets/pdf/Common\\_Agenda\\_Report\\_English.pdf](https://www.un.org/en/content/common-agenda-report/assets/pdf/Common_Agenda_Report_English.pdf)

<sup>304</sup>ADB. 2020. Financing Disaster Risk Reduction in Asia and the Pacific. Available online at: <https://www.adb.org/sites/default/files/institutional-document/670596/financing-disaster-risk-reduction-asia-pacific.pdf>

<sup>305</sup>Government of Fiji/GFDRR. Climate Vulnerability Assessment: Making Fiji Climate Resilient. Available online at: [https://www.gfdr.org/sites/default/files/publication/Making%20Fiji%20Climate%20Resilient%20-%20Full%20Report\\_0.pdf](https://www.gfdr.org/sites/default/files/publication/Making%20Fiji%20Climate%20Resilient%20-%20Full%20Report_0.pdf)

<sup>306</sup>ECLAC/German Cooperation/UN. 2020. Planning for Disaster Risk Reduction within the Framework of the 2030 Agenda for Sustainable Development. Available online at: [https://repositorio.cepal.org/bitstream/handle/11362/46639/1/S2000452\\_en.pdf](https://repositorio.cepal.org/bitstream/handle/11362/46639/1/S2000452_en.pdf)

The challenge for SIDS is that **all risk is virtually systemic risk** given the limited size of the geography, the isolation, interdependency and economic limitations. Compartmentalized approaches towards analysing and managing risks are inadequate and need to be strengthened by anticipatory approaches inspired by systems thinking to reduce adverse systemic risk outcomes.<sup>307</sup> This point was reinforced by the Caribbean Disaster Emergency Management Agency at the recent Global Platform 2022.<sup>308</sup>

There is also the challenge that while countries may have **DRR-responsive governance structures, there is little enforcement**. In the Caribbean, for instance, SIDS have been pursuing risk-informed construction. This has resulted in the implementation of mandatory building codes. However, these are not fully enforced due to inadequate inspection processes and limited availability of skilled construction contractors and supervisors.<sup>309</sup> This is a bigger constraint for states spread over several islands; geographic dispersion makes enforcement difficult and costly. In Trinidad and Tobago, for instance, the disaster management authority has no enforcing capability, like in many other SIDS. Similarly, in Kiribati, increasing urbanization has created pressures on the environment and driven populations to vulnerable sites. In South Tarawa for instance, people tend to build homes in vulnerable coastal areas and water reserves, without compliance with building codes and other legislation.<sup>310</sup> It becomes a political issue to displace populations, which may allow violations of codes to occur.

#### **Limited Institutional Absorptive Capacity**

SIDS may attract funding for improving DRR governance but may not have resources to actualize actions on the ground. In Cabo Verde for instance, a diagnostic demonstrated that the country has sound legal and institutional Frameworks on DRR. However, when examining the governance structures more broadly, it was

noted that the system was inadequate, based on an incomplete legislative foundation, with no operational guidelines and procedures in place. The incomplete legislation paired with scarce capacity, leads to a system with a lack of clear mandate and ambiguities. This results in a lack of clarity between national and municipal responsibilities for DRR.<sup>311</sup>

#### **Land Tenure poses constraints to effective DRR**

In many SIDS there is a **lack of clear governance of land tenure**, which has implications on communities possibly residing in high-risk areas. With governments not knowing how many people are located in which areas, there is difficulty in providing messaging to those zones, and for implementing risk-informed policy and programs.

Unregulated settlements may also be inhabited by refugee communities and the most vulnerable, with limited channels for governments to access them. Migrant communities may also be made up of different linguistic groups, and may face challenges in receiving or interpreting early warnings or evacuation notices. There is also the risk that unregulated settlements may not have access to power, telecommunications or technology in the zone they are located, further exacerbating marginalization and vulnerability.

In Trinidad and Tobago for instance, there are over 50 pieces of legislation that cover land tenure, many of which overlap, many of which are unknown, with little to no sensitisation at the community level. The lack of cross-government collaboration on this issue means that various departments have their own policies without a coherent approach, while the Office of the Commissioner of State Lands, which is designated authority for the management and enforcement of state land matters, operates without sufficient enforcement capacity. Given weak enforcement of laws, many persons occupy and/or construct edifices in remote

---

<sup>307</sup>UNDRR/ISC/RISKKAN. 2022. Systemic Risk: Review and Opportunities for Research Policy and Practice from the Perspective of Climate, Environmental and Disaster Risk Science and Management. Available online at: <https://www.undrr.org/publication/briefing-note-systemic-risk>

<sup>308</sup>GP2022. 23-28 May Summary Report GP2022. Available online at: <https://globalplatform.undrr.org/news/23-28-may-2022-summary-report-gp2022>

<sup>309</sup>ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries' Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)

<sup>310</sup>Workshop Questionnaire. 2022.

<sup>311</sup>World Bank/GFDRR. 2020. Cabo Verde Emergency Preparedness and Response Diagnostic: Building a Culture of Preparedness.

zones, some of which are areas zoned as reserves, near ecologically vulnerable sites, or in sites prone to floods or fire.<sup>312</sup> Similarly in Fiji, 63 % of total population growth over the last 15 years has occurred in unplanned, extra-legal and informal settlements. An estimated 12 % of the urban population and 6 % of the rural population live in low-elevation coastal zones that are 10 metres or lower and adjacent to the coastline, and highly prone to flooding and wave surges.<sup>313</sup>

### Procurement Delays at National Level

Internal financing systems and slow procurement processes at the national government level may undermine DRR activities. In Kiribati, there is limited staffing and capacity to enable an efficient flow of finances to cater for DRR needs which at times frustrates donors or development partners. As a result, there have been instances where development partners have channelled funds to NGOs or other UN Agencies to cater for DRR programs in Kiribati. This results in lost opportunities to bolster capacities at the institutional level.<sup>314</sup>

## 5.2 Indigenous Knowledge as Central to DRR

### Summary Box- Indigenous Knowledge as Central to DRR

- Traditional knowledge in SIDS has supported communities to reduce their vulnerability and exposure to hazards.
- Indigenous knowledge is not sufficiently learned from, shared, or mainstreamed within DRR policies.
- Indigenous engagement during project design and implementation may not meaningfully engage indigenous communities project life cycles, and/or may only include the involvement of leadership and not necessarily the most marginalized.

To strengthen institutional responses to disasters it is necessary to explore the following:

- Integrating indigenous perspectives into disaster risk planning; establishing channels such as multi-stakeholder platforms, or consultation processes, through which indigenous peoples' inputs, knowledge and feedback on DRR plans is meaningfully recorded, followed up on, and channelled to larger government institutions.
- Documenting traditional methods of risk reduction to create historical repositories.
- Collaborating with indigenous groups in the design of early warning systems to ensure messaging is culturally and linguistically

relevant, building on existing successful means of communication, and leveraging effective local practices.

- Supporting community-owned community-level DRR plans and strategies, supporting community empowerment
- Exploring non-formal means of disseminating indigenous knowledge, and collating best practices as a model for education, potentially for upscaling best practices in DRR
- Promoting to donors and partners the importance of leveraging indigenous knowledge—not just in cursory consultations, but as core project activities

There is a wealth of traditional knowledge in SIDS around the world that has supported communities to reduce their vulnerability and exposure to hazards. Yet this knowledge is not sufficiently learned from, shared, or mainstreamed within DRR policies. This acts as a barrier for improving DRR efforts and strengthening institutional capacity and response.

There numerous disparate examples of where local communities have risk-informed planning and response in the face of extreme climate events. In Vanuatu, during Category 5 Tropical Cyclone Pam, local knowledge, coupled with traditional construction, insulated certain populations from loss of life and destruction. Five casualties were reported on Tanna Island, which was hard hit by the cyclone, and the low number of loss of life was attributed to the traditional construction of local community shelters ("nimaleten").<sup>315</sup> The rooves of these structures were sloped to the ground, making it difficult for the wind to blow them off, and were made of various plants (Nolaou-liyao, Nouhil, Nameuhameuh and the coconut palm or the pandanus plaques (noumankiou)).<sup>316</sup> While these traditional structures take more time and require greater labour than construction of concrete

<sup>312</sup>GEF/FAO. 2020. "BIOREACH: Biodiversity Conservation and Agroecological Land Restoration in Productive Landscapes of Trinidad and Tobago" project.

<sup>313</sup>Government of Fiji/GFDRR. Climate Vulnerability Assessment: Making Fiji Climate Resilient. Available online at: [https://www.gfdr.org/sites/default/files/publication/Making%20Fiji%20Climate%20Resilient%20-%20Full%20Report\\_0.pdf](https://www.gfdr.org/sites/default/files/publication/Making%20Fiji%20Climate%20Resilient%20-%20Full%20Report_0.pdf)

<sup>314</sup>Workshop questionnaire response. 2022.

<sup>315</sup>UNDRR. 2015. Local Knowledge Saves Lives in Vanuatu. Available online at: <https://www.undrr.org/news/local-knowledge-saves-lives-vanuatu>

<sup>316</sup>Ibid.

housing, their resilience reflects the application of traditional knowledge. Recognizing, codifying and mainstreaming such indigenous and local-level practices for DRR purposes would serve SIDS.

Similarly, a study in the Baie Martelli village, Pentecost Island in Vanuatu, noted that traditional storytelling improved communities' response to the 1999 tsunami. When these traditional stories are married to other culturally sensitive warnings and messaging, they can have a tremendous impact in preparing populations.<sup>317</sup>

While national meteorological hydrological services are often employed to transmit seasonal and warning messages, **many communities in the Pacific have little access to the messages due to remoteness or isolation. As a result, they rely on traditional knowledge, or on a combination of messages.** In the Solomon Islands, when Category 6 Hurricane Zoe made landfall, communities on the islands of Tikopia and Anuta who did not have access to forecasts, relied on traditional knowledge to survive. Elders guided communities to note movements of ocean currents and bird behaviour to evacuate people safely to caves. There was no mortality reported.<sup>318</sup>

### **Need for Engagement of Indigenous Populations in DRR Initiatives**

An independent evaluation of the GCF noted that only 12 % of SIDS projects self-reported engagement with local and indigenous communities during project implementation.<sup>319</sup> This raises concern over the lack of qualitative engagement of indigenous communities throughout project life cycles. It also raises questions on the nature of consultations with indigenous groups for project development, and whether these are merely with leadership as opposed to the most marginalized community-members. This also raises questions on the quality of engagement, and whether projects have activities that can be owned and managed by indigenous

communities to ensure buy-in and support empowerment.

To strengthen institutional responses to disasters it is necessary to explore how indigenous communities and knowledge can be better integrated into national DRR. This should involve the following:

- Integrating indigenous perspectives into disaster risk planning; establishing channels such as multi-stakeholder platforms, or consultation processes, through which indigenous peoples' inputs, knowledge, and feedback on DRR plans are meaningfully recorded, followed up on, and channelled to larger government institutions
- Documenting traditional methods of risk reduction to create historical repositories.
- Collaborating with indigenous groups in the design of early warning systems to ensure messaging is culturally and linguistically relevant, building on existing successful means of communication, and leveraging effective local practices
- Supporting community-owned community-level DRR plans and strategies, supporting community empowerment
- Exploring non-formal means of disseminating indigenous knowledge, and collating best practices as a model for education about disaster risk reduction, potentially for upscaling
- Promoting to donors and partners the importance of leveraging indigenous knowledge—not just in cursory consultations, but as core activities in project design

### **Key Message**



SIDS should be supported in collecting, formalizing, mainstreaming and disseminating best practices of indigenous and local practices, and integrating citizen science for more informed DRR measures

<sup>317</sup>Walshe, Rory & Nunn, Patrick. 2012. Integration of Indigenous Knowledge and Disaster Risk Reduction: A Case Study from Baie Martelli, Pentecost Island, Vanuatu. *International Journal of Disaster Risk Science*. 3. Available online at: [https://www.researchgate.net/publication/237085383\\_Integration\\_of\\_Indigenous\\_Knowledge\\_and\\_Disaster\\_Risk\\_Reduction\\_A\\_Case\\_Study\\_from\\_Baie\\_Martelli\\_Pentecost\\_Island\\_Vanuatu](https://www.researchgate.net/publication/237085383_Integration_of_Indigenous_Knowledge_and_Disaster_Risk_Reduction_A_Case_Study_from_Baie_Martelli_Pentecost_Island_Vanuatu)

<sup>318</sup>Deo, A., Chand, S.S., McIntosh, R.D. et al. 2022. Severe tropical cyclones over southwest Pacific Islands: economic impacts and implications for disaster risk management. *Climatic Change* 172, 38. Available online at: <https://link.springer.com/article/10.1007/s10584-022-03391-2#citeas>

<sup>319</sup>GCF. 2020. Independent Evaluation of the Relevance and Effectiveness of the Green Climate Fund's Investments in Small Island Developing States. Available online in: <https://ieu.greenclimate.fund/sites/default/files/document/201123-sids-final-report-top-web.pdf>

## 5.3 Monitoring and Reporting Gaps

### Summary Box- Monitoring and Reporting Gaps

Monitoring and reporting on DRR remains a challenge for many SIDS.

Reporting on DRR/SDG indicators do not provide a fulsome picture of how countries are performing at the local level, as SIDS lack data and provide incomplete reports.

The main challenge in monitoring progress on DRR is the following:

- Disaster management authorities are understaffed: DRR monitoring staff are not sufficiently resourced, lack of budget expenditure on DRR monitoring.
- DRR is an intersectoral issue; other sectors do not monitor their expenses or DRR activities or report them centrally. Reporting on the Sendai Monitor is incomplete/skewed for most SIDS.
- There are too many frameworks and projects to report on which is labour-intensive for disaster management authorities. Reporting on the Sendai Framework is not guiding decision-making—data is often generated after the fact, for reporting processes, but not for guiding policymaking
- For some SIDS, annual reporting on Targets E and F is too intensive and unrealistic, especially if some of the results are to come from 5-year projects or initiatives. The majority of SIDS for 2021 have not submitted data for Target E.
- It is not clear how aggregate findings from the Sendai Monitor are used or should be used in SIDS.

Monitoring and reporting on DRR remains a challenge for many SIDS. The Sendai Framework sets up 38 indicators that track progress on the accomplishment of the seven targets. These are aligned with the global indicator framework for the SDGs and targets of the 2030 Agenda for Sustainable Development, which include 232 indicators clustered in 17 goals and 169 targets. The two monitoring frameworks are intended to complement one another and identify disaster risk drivers and their interrelatedness to vulnerability and exposure within development.<sup>320</sup>

As is noted in the literature, however, **indicator frameworks for both agendas need to be more coherent, robust and integrated into national development planning to demonstrate progress.** A paper by the UNDRR notes that “taken individually, none of the frameworks are embedded into the full range of disaster risk driver’s realm, as they might should they had been originally conceived from an integrated perspective. Therefore, a systemic view of risks and development frameworks must be combined in development planning at the country level.”<sup>321</sup> **Reporting on these indicators do not provide a fulsome picture of how countries are performing at the local level.** This raises questions as to how useful this reporting is for national planning. It is also difficult to tease out from SDG reporting, the levels of investment and activity each government sector has actualized.

The SIDS consulted for this assessment have noted that the actual reporting platform is user-friendly to navigate. However, data required to report through this platform, is challenging to access, and tedious to generate. Some of the issues that arise are the following:

- Insufficient DRR monitoring staff available as disaster management authorities are understaffed: not sufficiently resourced, and may lack national budget expenditure on DRR monitoring.
- DRR is an intersectoral issue; other sectors often do not monitor their expenses or DRR activities; reporting on the Sendai Monitor is thus incomplete/skewed for most SIDS

<sup>320</sup>Lucatello, S. & Alcantara-Ayala, I. 2022. Addressing the Interplay of the Sendai Framework with Sustainable Development Goals in Latin America and the Caribbean: Moving Forward or Going Backwards? Available online at: <https://www.undrr.org/publication/addressing-interplay-sendai-framework-sustainable-development-goals-latin-america-and>

<sup>321</sup>Ibid.

- There are too many frameworks and projects to report on which is labour-intensive for disaster management authorities
- Reporting on the Sendai Framework is not guiding decision-making—often data is generated after the fact for reporting processes, but not for guiding policymaking
- For some SIDS, annual reporting on Targets E and F is too intensive and unrealistic, especially if some of the results are to come from 5-year projects or initiatives. Also, when examining the reporting against Target E, it is apparent that the majority of SIDS for 2021 have not submitted data.<sup>322</sup>
- It is not clear how aggregate findings from the Sendai Monitor are used or should be used

### **Key Message**

Reporting requirements on DRR activity needs to be rethought for SIDS if year after year, incomplete data and information is submitted.



---

<sup>322</sup>UNDRR. 2021. Target E: Disaster Risk Reduction Strategies Analytics. Available online: <https://sendaimonitor.undrr.org/analytics/global-target/17/6>



## 6. Partnerships

### Summary Box- Partnerships

There are numerous partnerships, collaborations, projects, and technology pools available to support SIDS; these take the form of research partnerships, early warnings partnerships, information hubs, advocates for SIDS, and technical facilities

The following constraints prevent SIDS from maximizing benefits from partnerships

- SIDS are not always aware of all the technology partnerships and collaborations available to them—a mapping exercise may be useful
- SIDS do not have the staff and resources to manage many partnerships
- There is a lack of meaningful engagement of indigenous or marginalized communities within partnerships
- Knowledge transfer/capacity building partnerships require a long-term perspective
- Some partnerships can duplicate efforts and data provided
- Partnerships need to support SIDS' monitoring capacity
- There is a lack of private sector engagement in many partnerships
- Some projects fund regional partnerships and bodies instead of funding national institutions which forego national capacity-building

SIDS have also identified the need for sharing cross-regional best practices. The following have been identified as areas for potential exchange

- Ecosystems-based adaptation/ nature-based solutions
- How to better manage monitoring and reporting across various sustainable development frameworks and donors; how to improve monitoring at large
- Effective data platforms which allow inputting of raw data without much conversion and allow for inter-sectoral use
- Successful engagement with whole-of-society
- Integrating indigenous knowledge in a meaningful way within DRR
- Climate risk insurance
- Innovative financing policies

The High-Level Political Declaration on the Midterm Review of SAMOA Pathway recognizes the importance of partnerships for SIDS: "We acknowledge the value of partnerships as a means of supporting the sustainable development of small island developing States."<sup>323</sup> Similarly the Sendai Framework notes

the relevance of partnerships in several places in the text, and asserts that: "An effective and meaningful global partnership and the further strengthening of international cooperation, including the fulfilment of respective commitments of official development assistance by developed countries, are essential for effective disaster risk management."

**There are numerous partnerships, collaborations, projects and technology pools to support SIDS.** A key outcome of the SAMOA Pathway was the creation of the SIDS Partnership Framework, which allows the monitoring, record-keeping of new and existing partnerships.<sup>324</sup>

In 2018, based on a UN DESA report on partnerships, it was assessed that the Pacific region has the highest number of partnerships, at 44 %, while the Africa, Indian Ocean, Mediterranean and South China Seas (AIMS) region has the least at 6 %.<sup>325</sup>



Photo: Flickr/UN DRR Gallery

<sup>323</sup>UN. 2019. High-Level Political Declaration on the Midterm Review of the Samoa Pathway. Available online at: <https://www.un.org/pga/73/wp-content/uploads/sites/53/2019/08/SAMOA-MTR-FINAL.pdf>

<sup>324</sup>UN DESA. Small Island Developing States: Genuine and Durable Partnerships for the Sustainable Development of Small Island Developing States. Available online at: <https://sdgs.un.org/partnerships/action-networks/sids-partnerships>

<sup>325</sup>IISD. 2018. DESA Reviews Status, Priorities, and Challenges of SIDS Partnerships. Available online at: <https://sdg.iisd.org/news/desa-reviews-status-priorities-and-challenges-of-sids-partnerships/>

## A snapshot at Pacific Partnerships

Pacific SIDS benefit from a sophisticated network of regional institutions and organizations such as Secretariat of the Pacific **Regional Environment Programme** (SPREP), the **Pacific Community** (SPC), **The Pacific Island Forum**, **South Pacific Geosciences Commission**, the **Asia Pacific Resilience Network**, the **United Nations Economic and Social Commission for Asia and the Pacific** (ESCAP) and the **Pacific Islands Development Programme**, among others.

The **Pacific Islands Emergency Management Alliance** (PIEMA), is a mechanism that co-ordinates approaches to emergency services when preparing, responding and recovering from disaster and plays a key role in supporting delivery of the Boe Declaration Action Plan as well as the Framework for Resilient Development in the Pacific (FRDP).

The **Pacific ENSO Application Climate** (PEAC) Center, provides information on monthly rainfall reports and rainfall outlooks, tropical cyclones activity, sea level discussion, forecast discussions, and drought monitoring updates in the Federated States of Micronesia.

The **CommonSensing Project** is a partnership between Fiji, Solomon Islands, and Vanuatu, with a consortium of international partners, as part of the U.K. Space Agency's International Partnership Programme building geospatial capabilities.

## A Snapshot at Caribbean Partnerships

- **CARICOM** and the **Environmental Systems Research Institute** (ESRI) provide geospatial information available regionally. The Caribbean Geoportal backed by ESRI, offers free data and tools to support the mapping community in the subregion.
- The **Caribbean Institute for Meteorology and Hydrology** (CIMH) is a training and research organisation that aims to improve the meteorological and hydrological services for the economic well-being of countries. It provides data and capacity building to its 16 member states.
- The Caribbean also has a **Coral Reef Early Warning System Network** based on climate and biological monitoring stations. This initiative was supported by the **Caribbean Community Climate Change Centre** (CCCCC) in collaboration with the National Oceanic and Atmospheric Administration (NOAA) and

funding from the Australian Agency for International Development, the European Union Global Climate Change Alliance (EU-GCCA), and USAID.

- **Caribbean Climate Online Risk and Adaptation Tool** (CCORAL), a collaboration between the Global Water Partnership, the CCCCC; the **Caribbean Assessment of Regional Drought Tool** (CARiDRO) is further beneficial to SIDS
- Development cooperation between the Government of Finland and **Association of Caribbean States** (ACS) has reinforced monitoring networks through the "Strengthening Hydro-meteorological Operations and Services in the Caribbean SIDS Project", implemented by the Finnish Meteorological Institute.
- The Strengthening of Spatial Data Infrastructure in Member States and Territories of the Association of Caribbean States (ACS) project benefits Antigua and Barbuda, Bahamas, Barbados, Belize, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Trinidad and Tobago. It has been implemented by the Mexican National Institute of Statistics and Geography with funding from the Mexican Agency for International Development Cooperation and the Government of Chile and has played a key role in the development of the **Caribbean Territorial Information Platform for Disaster Prevention**, which is an online GIS-based multi-risk analysis tool for sharing and managing risk information across the Caribbean.
- Under the United States Agency for International Development (USAID) Climate Change Adaptation Programme, the **Caribbean Development Bank** (CDB), the CCCCC and participating CDB's Borrowing Member Countries (BMCs), Caribbean countries have received of grants for the acquisition of LIDAR systems.
- In the Dominican Republic private sector partners also play a key role in disseminating early warning. The three large **telecommunications companies** can recover communication in times of emergencies, and in case of breakdown can reconnect in five minutes. The telecommunications companies share the warning SMS messages in certain sectors and regions, particularly in the touristy areas and translate messages into English, German and French.



- The European Union-Global Climate Change Alliance Sustainable Land Management Project provided land information management tools such as a GIS, global navigation satellite system (GNSS), global positioning systems, and other technical instruments as telemetric weather stations, pond level gauges, water testing kits, soil testing kits, etc. Under this initiative drones were also employed to support post-disaster assessments, aerial imagery and were able to reveal which roads were blocked and houses damaged during emergencies.

## A Snapshot at the AIS

- The **Regional Integrated Multi-Hazard Early Warning System for Africa and Asia** (RIMES) collects, analyses and monitors weather, earthquake and tsunami hazards and supports African and Asian SIDS.
- In the Southwest Indian Ocean, SIDS are implementing a five-year **Climate Risk and Early Warning** (CREWS) project to improve operational forecasting and multi-hazard early warning systems. This is being done in alignment with another initiative, by the **French Development Agency** (AFD), to prepare a GCF proposal for four national meteorological and hydrological services that are Members of the Indian Ocean Commission. CREWS is a partner of the **InsuResilience Partnership and the Risk Informed Early Action Partnership** (REAP).

## International Partnerships

**International partnerships play a key role in informing SIDS of potential threats, especially those that can be detected several days prior to landfall.** Caribbean SIDS most often receive storm updates relayed from the Miami-based National Hurricane Center, while Pacific jurisdictions receive information from the Joint Typhoon Warning Center in Hawaii.<sup>326</sup> The Pacific Tsunami Warning System (PTWC) uses satellite technology to collect information on wave

heights to transmit warnings to emergency centres, alerting SIDS around the world in case of tsunamis.<sup>327</sup> It is operated by NOAA.

There is an intricate network of hydrometeorological staff and national disaster management agencies that collaborate. Organizations such as the World Meteorological Organization (WMO) and UNDRR have announced the creation of a Centre of Excellence for Climate and Disaster Resilience. This entity will serve as an **information hub** on how to mitigate risks and will focus on SIDS, LDCs and land-locked countries.<sup>328</sup> UNDRR supports national disaster loss databases in over 110 countries. There are also over 150 countries reporting against the Sendai Framework targets through the Sendai Framework Monitor, and creating a global composite of data. SIDS can consult the Global Risk Assessment Framework which is a tool for risk-informed development planning and programs, early and anticipatory action, and providing data for early warning systems.<sup>329</sup>

AOSIS plays a significant role in **advocating for SIDS** on the global stage. Through AOSIS, SIDS collaborate and demonstrate just how influential they are in international negotiations. AOSIS has pushed for addressing multidimensional resilience in SIDS and has introduced the "SIDS Package" to introduce critical climate change initiatives to safeguard SIDS' populations. These are in line with global initiatives such as the Early Action Partnership, the DRR CCA Coherence Initiative and the Coalition for Climate Resilient Investment.<sup>330</sup>

There are also various technical facilities that are gaining support as committed during the Global Platform 2022. The Systematic Observations Financing Facility and the Climate Risk and Early Warning Systems Initiative are examples of such entities that receive support from Austria and Canada respectively.

There are also existing partnerships to **enhance research capacity**, which is a challenge in SIDS. The government of Japan for instance is

<sup>326</sup>Shultz, J.M., Cohen, M.A., Hermosilla, S., Espinel, Z., McLean, A. 2016. Disaster risk reduction and sustainable development for small island developing states. *Disaster Health*. Apr 8; 3(1)

<sup>327</sup>UN-SPIDER. Satellite Telecommunications in Tsunami Early Warning Systems. Available online at: <https://www.un-spider.org/satellite-telecommunications-tsunami-early-warning-systems>

<sup>328</sup>IISD. 2021. Disaster Risk Reduction in an Unstable World. Available online at: <https://www.iisd.org/articles/disaster-risk-reduction>

<sup>329</sup>UNDRR. 2021. SRSG Mizutori's Remarks at Early Warnings for Small Island Developing States-Bridging the Capacity Gap by 2030-COP 26 Side Event. Available online at: <https://www.undrr.org/news/srsg-mizutori-remarks-early-warnings-small-island-developing-states-bridging-capacity-gap>

<sup>330</sup>AOSIS. About Small Island Developing States. Available online at: <https://www.un.org/ohrls/content/about-small-island-developing-states>

is bolstering such support through satellite training and readings and has provided equipment for the Tongan National Emergency Management Office, to support improved standard operating procedures for responses to earthquakes and tsunamis and for enhanced coordination on hydrological services.<sup>331</sup>

**GCF is currently the largest financier of early warning systems in the world**, and could be a resource for SIDS, if they can overcome the capacity challenges in applying for funding. An estimated USD 1.2 billion of GCF's approved budget will be dedicated to climate information and early warning in the future.<sup>332</sup>

### Challenges with Partnerships

What this snapshot provides is the awareness that there is the interplay of numerous institutions, donors and beneficiaries working on DRR along with SIDS. Despite this, there are some SIDS-specific constraints that prevent countries from optimizing the resources offered through partnerships. Some of the challenges involve the following:

- **SIDS are not always aware of all the technologies, partnerships and collaborations available to them.** It takes human resources to map out what each partnership can yield, as well as to engage. A mapping exercise would be useful to understand which entity provides which service, and how these can fill some of the gaps at the national level.
- **SIDS do not have the staff and resources to manage many partnerships and initiatives that could support them.** Participation in one partnership may cost time in another.
- **Lack of meaningful engagement of indigenous or marginalized communities within partnerships-** there may be a tendency for partnerships to attract the same participants across time, thereby negating the engagement and collaboration of marginalized communities which may bring varied knowledge and experience.
- **Knowledge transfer/capacity building partnerships require a long-term perspective-** Some projects facilitated through partnerships have too short a duration to see substantial and sustainable results; long-term partnerships and accompaniment is required to observe substantial changes. For technology and

training partnerships, there is also a need to continuously upgrade training requirements and technologies. Maintenance and repair supports should be envisioned as a part of partner support.

- **Some partnerships can duplicate efforts and data provided;** more specialized value added may be needed from different partnerships.
- **Partnerships need to support SIDS' monitoring practices-** Monitoring for DRR success is an ongoing challenge for SIDS. With a shortage of monitoring staff and/or tools, SIDS require substantial efforts to understand the results of DRR initiatives. Filling this gap through partnerships would greatly support SIDS in areas where they have less capacity.
- **Lack of private sector engagement in many partnerships-** DRR is not exclusively a public sector responsibility, and often private sector partners are not engaged in partnerships on DRR. Greater inclusion of these partners could lend to a more coherent and whole-of-society approach to DRR.
- **Some projects fund regional partnerships and bodies instead of funding national institutions** which may be a missed opportunity for building capacity at national levels

Another institutional challenge that has been raised by SIDS, is the lack of sharing of best practices and lessons learned, especially across regions, and this is an issue that could be addressed through partnerships. The following areas have been highlighted as topics of interest for SIDS:

- Ecosystems-based adaptation/ nature-based solutions
- How to better manage monitoring and reporting across various sustainable development frameworks and donors
- Effective data platforms which allow inputting of raw data without much conversion and allow for inter-sectoral use
- Successful engagement with whole-of-society
- Integrating indigenous knowledge in a meaningful way within DRR
- How to improve monitoring within the country
- Climate risk insurance
- Innovative financing policies
- Sharing data on the benefits of DRR investments

<sup>331</sup>Schimel, A. & Holland, E. 2020. Tonga: A Pacific Disaster Prevention Review, edited by Paul Barnes. Australian Strategic Policy Institute. Available online at: <http://www.jstor.org/stable/resrep25128.5>

<sup>332</sup>OCHA. 2021. GCF Boosts Early Warning Systems to Avert Climate-Related Disasters. Available online at: <https://reliefweb.int/report/world/gcf-boosts-sids-early-warning-systems-avert-climate-related-disasters>

# PART 4:

## CONCLUSIONS AND KEY MESSAGES

---

Photo: UNDRR/Antoine Tardy

## 7. Additional Best Practices

While the aforementioned sections highlight existing challenges and developments in DRR, it is useful to provide a snapshot of other best practices and advances, as many SIDS have improved their early warning systems and communication with communities. However, it is worth noting that significant gaps exist in the documentation of best practices in SIDS. Much of the information is disparate and captured through project reports, and few countries provided information in this regard during this assessment.

### Technology & Forecasting

- In the Caribbean, specialized communications equipment such as satellite telephones and ultra-high frequency radios, have been used to communicate early warning messages in times of crisis. During outages, Cell on Wheels (COW) mobile phone towers are used as temporary solutions to re-establish mobile services in affected regions.<sup>333</sup> To supplement these communication sources, there are also radio operators available to operate emergency communication systems when traditional telephony and data transmission systems are not available.<sup>334</sup> This is supported by the International Telecommunications Union (ITU). This use of radio technology reflects the partnership between ITU and Caribbean SIDS captured within the "Use of ICTs in Emergency and Disaster Situations in the Caribbean Region" project.<sup>335</sup>
- In Tonga there is progress towards improved multi-hazard warnings, which can support aviation and marine forecasting and providing tropical cyclone forecasts. One of the lessons learned from previous crises, was that Tonga's early-warning systems under

Tropical Cyclone Gita and Winston did not include storm surge predictions, which are now deemed necessary to be integrated.<sup>336</sup>

- Under the "Improving Climate Data and Information Management" Project, Jamaica, has been able to strengthen timely and reliable data collection and management, and has benefited from improved forecasting, flood warning systems and climate resilient planning through the installation and upgrading of real-time streamflow and rainfall gauges. This initiative fits within the framework of the Pilot Program for Climate Resilience – a funding mechanism under the Climate Investment Funds (CIF) which assists developing countries to integrate climate resilience into development planning and investment.

### Sustainable Development

- Tonga has been recognized as a leader by the Global Green Growth Institute for implementing sustainable economic development into its DRR projects. In Tonga's DRR interventions and post-disaster needs assessments, 'building back better' has been central. Following Tropical Cyclone Ian, Tonga's recovery has been geared towards green growth. Through support from the World Bank, Tonga has focused on innovative housing recovery and reconstruction program.<sup>337</sup>
- Tuvalu has demonstrated the importance of disaster management as part of sustainable development. DRM is now included in key sustainable development strategies, including TE Kakeega III – National Strategy for Sustainable Development (2016- 2020) and National Strategic Action Plan for Climate Change and Disaster Risk Management (2012-2016).<sup>338</sup>

---

<sup>333</sup>ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries' Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)

<sup>334</sup>Ibid.

<sup>335</sup>Ibid.

<sup>336</sup>Schimel, A. & Holland, E. 2020. Tonga: A Pacific Disaster Prevention Review, edited by Paul Barnes. Australian Strategic Policy Institute.

<sup>337</sup>Ibid.

<sup>338</sup>Government of Tuvalu. Tuvalu Strategic Roadmap for Emergency Management 2021-2023: Strengthening Emergency Management Performance Through Sector Coordination and Cooperation. Available online at: [https://spccfpstore1.blob.core.windows.net/digitallibrary-docs/files/22/224d1e2f6f6e556af6b16209018c8.pdf?sv=2015-12-11&sr=b&sig=zUTu%2FDt%2FhxJyTbCOItM3%2FRUwqipNruOLQfZ40UsBte0%3D&se=2023-01-31T17%3A23%3A18Z&sp=r&rscc=public%2C%20max-age%3D864000%2C%20max-stale%3D86400&rsct=application%2Fpdf&rscd=inline%3B%20filename%3D%22Tuvalu\\_SREM\\_Final\\_2021\\_full\\_version.pdf%22](https://spccfpstore1.blob.core.windows.net/digitallibrary-docs/files/22/224d1e2f6f6e556af6b16209018c8.pdf?sv=2015-12-11&sr=b&sig=zUTu%2FDt%2FhxJyTbCOItM3%2FRUwqipNruOLQfZ40UsBte0%3D&se=2023-01-31T17%3A23%3A18Z&sp=r&rscc=public%2C%20max-age%3D864000%2C%20max-stale%3D86400&rsct=application%2Fpdf&rscd=inline%3B%20filename%3D%22Tuvalu_SREM_Final_2021_full_version.pdf%22)

- UNDP has partnered with Antigua and Barbuda and Dominica to improve construction standards and support more resilient building code amendments, to “build back better”. Antigua and Barbuda has prioritised the resilience of its building sector by applying climate-resilient technologies and interventions in public and community buildings (i.e. disaster services, healthcare, fire services, police, schools and community centres).<sup>339</sup>

### Engaging Local Communities

- Tonga has demonstrated leadership in engaging communities into DRR and building resilience. One of the strategies has been to engage local organizations such as the Anglican Church, the Mainstreaming of Rural Development Innovations (MORDI) Program, Live and Learn and the University of the South Pacific’s Pacific Centre for Environment and Sustainable Development (PaCE-SD).
- In the Caribbean, grassroots campaigns have played a major role in fostering support and buy-in of early warnings at the community level. Some of these campaigns have obtained success by having local-level ownership. The Caribbean Natural Resources Institute (CANARI), for instance, developed a toolkit to support civil society organisations in their advocacy for climate change adaptation and DRR using ICTs.<sup>340</sup> This has facilitated participatory vulnerability assessments and adaptation planning utilising ecosystem-based approaches, and participatory modeling. CANARI also has a project on Powering Innovations in Civil Society and Enterprises for Sustainability in the Caribbean (PISCES) with the purpose of climate-proofing rural enterprises.<sup>341</sup>
- There are also examples of good governance and political leadership which demonstrates

the buy-in and value of DRR activities. For instance, during the eruption of la Soufrière volcano in St. Vincent and the Grenadines, the Prime Minister hosted a daily program with the chief scientist and heads of different sectors, to communicate accurate information. This fostered trust, warned populations, and kept them apprised of the latest scientific information.<sup>342</sup>

- The Government of Fiji applied lessons learned from their experience during Tropical Cyclone Winston. They readjusted their warnings to simplify and standardize them, so they could be better understood. Color coding was used to define the intensity of a disaster (different colors for “Alert,” “Take Action,” and “Stand Down”). In addition, the NDMO conducted regular drills with stakeholders representing diverse social groups.<sup>343</sup>
- The geographic dispersion of the Islands of Kiribati pose challenges to communications and reporting. To address this problem the NDMO has established Island Disaster Committees (IDCs) in all 23 Islands of Kiribati. The establishment of IDCs and Disaster Taskforces at sub-national governments have assisted the central government and communities at island-level to improve their knowledge and understanding of DRR. Island leaders such as mayors and key champions have been identified in each Island Council thereby strengthening ownership of DRR processes and ensuring alignment among islands, and achieving results at the national level. Improved understanding of DRR has been observed, and in some communities, campaigns for coastal protection, mangrove planting and other traditional methods of coastal strengthening have been executed as nature-based DRR measures.<sup>344</sup>

<sup>339</sup>GCF. 2017. Enhancing Early Warning Systems to Build Greater Resilience to Hydro and Meteorological Hazards in Pacific Small Island Developing States (SIDS). Available online: <https://www.greenclimate.fund/sites/default/files/document/ppf-application-enhancing-early-warning-systems-build-greater-resilience-hydro-and-meteorological.pdf>

<sup>340</sup>ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries’ Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)

<sup>341</sup>CANARI quoted in ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries’ Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)

<sup>342</sup>UNDRR/CREWS/WMO. 2022. Caribbean Workshop: Measuring Effectiveness of Early Warning Systems through Sendai Framework Target (g) and Custom Indicators. Available online at: <file:///Users/erumshaziahasan/Downloads/MHEWS%20Workshop%20Report.pdf>

<sup>343</sup>Government of Fiji. Climate Vulnerability Assessment: Making Fiji Climate Resilient. Available online at: [https://www.gfdr.org/sites/default/files/publication/Making%20Fiji%20Climate%20Resilient%20-%20Full%20Report\\_0.pdf](https://www.gfdr.org/sites/default/files/publication/Making%20Fiji%20Climate%20Resilient%20-%20Full%20Report_0.pdf)

<sup>344</sup>Workshop Questionnaire. 2022.

## Partnerships

- Pacific SIDS are developing a regional tropical cyclone preparedness and response framework, through the Pacific Meteorological Council (PMC). The process will involve agreements among the National Meteorological and Hydrological Services (NMHS), regional providers such as the Fiji Meteorological Services, National Institute of Water and Atmospheric Research (NIWA) of New Zealand and the Australian Bureau of Meteorology.<sup>345</sup>
- The COVID-19 pandemic has revealed just how swiftly countries can work nationally and regionally to prevent the spread of risk. In addition to closing their borders in a coordinated fashion, many SIDS were able to increase national spending, and mobilize to negotiate lower-cost loans from international financing mechanism. In the Caribbean for instance, SIDS obtained agreement with the IDB for support on technical assistance, particularly in moving some of their industry online.<sup>346</sup> Many SIDS were forced to deal with a two-tier crisis, addressing disasters as well as managing the pandemic and ensuring that their health systems were not overrun by threats.

<sup>345</sup>Deo, A., Chand, S.S., McIntosh, R.D. et al. 2022. Severe tropical cyclones over southwest Pacific Islands: economic impacts and implications for disaster risk management. *Climatic Change* 172, 38. Available online at: <https://link.springer.com/article/10.1007/s10584-022-03391-2#citeas>

<sup>346</sup>IDB. 2020. Weathering the Coronavirus Storm in the Caribbean. Available online at: <https://www.iadb.org/en/improvinglives/weathering-coronavirus-storm-caribbean>




## 8. Conclusions and Recommendations

### 8.1 Conclusions

SIDS' capacities and abilities to implement successful DRR initiatives vary, however, it is apparent after reviewing the literature and individual country experiences, that greater and coordinated support is required to strengthen the MOI to implement the Sendai Framework. The ongoing Midterm Review of the Sendai Framework for Disaster Risk Reduction (MTR SF), and the upcoming 4<sup>th</sup> International Conference for SIDS, which will serve as the platform to launch the next international agenda for SIDS, serve as an optimal time to assess what gaps exist, and how MOI can be strengthened for improved DRR.

#### Key Message



The concrete progress on means of implementation for SIDS can be considered as an indicator to be measured in the follow-up to the MTR SF.

#### Financial Resources

SIDS are incredibly resourceful when it comes to mobilizing resources for their development, given how limited their economic base has historically been. They are exceptionally reliant on development assistance, remittances and international financial support. Yet, financing for DRR remains a challenge. As severe climate events increase, recessions and inflation loom, and as countries seek to recover from socioeconomic and health impacts of the COVID-19 pandemic, donors face growing demands.

As a result, **financing for DRR in SIDS has to be strategic, sustainable, and take into account barriers that have prevented the optimization of resources**, while acknowledging the necessity of funds for SIDS, which by dint of their geography and remoteness, they have limited access to. Concessional financing, for instance, continues to be a challenge for SIDS with small human resources. It is difficult for limited staff to apply for and manage complex and duplicative funding/reporting requirements. The requirements for co-financing, eligibility requirements, and application for simultaneous grants, make it challenging for SIDS to access resources needed for DRR. Often historic ties influence which SIDS receive funding from which donors, and many are subject to project delays

due to lengthy project development and approval processes. Managing several short-term projects can drain human resources, foster a project-based approach to DRR, rather than a programmatic one, and can lead to some SIDS implementing donor-driven priorities.

There is also the challenge that **financing does not match the scale of existing and future disaster risks**, as most disaster funding is allocated to recovery and response, rather than risk reduction or prevention. The ad-hoc nature of recovery funding, and the fact that it does not meet post-disaster needs, indicates that financing for DRR is imbalanced. Similarly, while climate change adaptation (CCA) funds and DRR funds may be contributing to similar objectives, a greater variety of funds are available for CCA. This causes redundancy of activities, lack of integration of DRR, and the inability to holistically measure DRR activity without appropriate indicators. The current approach to funding disaster risk reduction is lagging behind the rapid rate of creation and increasing complexity of disaster risk.

**Private sector resources, though transforming and increasingly aware of disaster risk, are still inadequate for addressing DRR needs.** Capital market investments do not account for disaster risk. Insurance has been evolving and could potentially play a greater role in DRR, however risk insurance facilities require external support to deliver commitments. Self-insurance-sovereign wealth funds, disaster funds, and/or stabilization funds that countries invest in are not sufficient to address the cost of severe disasters. Insurance by smaller entities for personal and business property may offer premiums that are too high for people to afford, and micro insurances may not be able to finance the cost of destruction from severe hazards. While momentum is gaining across the insurance industry to mainstream and operationalize DRR in its offerings, there is a need for further development of products that incentivize risk reduction and prevention, such as through variable pricing and policy prerequisites, or exemptions to provide incentives for risk reduction.<sup>347</sup> For the emergency risk facilities that currently exist, SIDS' capacity constraints prevent them from accessing them easily.

---

<sup>347</sup>The International Cooperative and Mutual Insurance Federation/UNDRR. 2020. From protection to prevention: The role of cooperative and mutual insurance in DRR. Available online at: <https://www.undrr.org/publication/protection-prevention-role-cooperative-and-mutual-insurance-drr>.

Microfinancing for DRR remains at the nascent stage and is supported by larger financial institutions or development partners in SIDS. Cost-benefit analyses conducted for the Asia and Pacific region, have shown ratios of 1:2, to as high as 1:55, in terms of the benefits from investing in disaster-resilient measures,<sup>348</sup> but this is not manifested in financing for DRR in SIDS. It is inadequate for the implementation of multi-hazard, prevention-oriented disaster risk reduction strategies to remain focused on reactive measures, such as contingency funds, insurance and catastrophe bonds to finance post-disaster response and recovery.

**Innovative financing solutions, such as green bonds, blue bonds and debt-swap opportunities are being developed and could serve DRR measures in SIDS.** However, many of these are in nascent stages. DRR requires political finessing to be considered as an investment that can prove profitable returns in the future. Such innovative tools still require backing from other institutions that can guarantee loans. Processes to secure loans require complex negotiations that could take years. Innovative financing tools must also address the problem of indebtedness that most SIDS face. As noted by ECLAC-UN: "Middle-income countries, such as those in Latin America and the Caribbean, require multilateral cooperation through the expansion and redistribution of liquidity and debt reduction to enhance their policy space to foster a sustainable recovery and advance their economic and social development."<sup>349</sup>

### **Recommendations for accessing financial resources for DRR by SIDS**

- Application requirements for concessional funding should be streamlined and consistent to avoid additional cost of time and resources for SIDS to apply. Greater coherence in donor requirement processes will reduce transaction costs and delays, and will foster greater alignment in the sustainable development arena.
- The uniqueness of SIDS must be considered in DRR project funding: co-financing requirements should be reduced; project timelines should be extended to account for travel/procurement to remote and isolated islands; project management budgets should

be increased from current limitations due to high costs in delivering projects in SIDS.

- Numerous short-term projects are onerous for SIDS. A programmatic, more long-term approach should be encouraged to deliver demonstrable results, avoid costly project preparation processes, and promote sustainability.
- International financial institutions, development banks, and the private sector should focus on DRR financing instruments that include risk reduction and prevention bonds, blended financing tools, pooled funds, guidance and methodologies to include DRR in the decisions of business and institutional investors to meet the scale of financing needed to prevent and reduce risks, and build resilience to current and future shocks and hazards. Central banks and credit rating agencies should align strategies and operations with the Sendai Framework to ensure that they prioritize risk reduction for SIDS.
- Disaster risk reduction financing by donors requires a multi-layered approach that should blend ex-ante and ex-post financing.
- Integration of DRR indicators within CCA activities should be common practice to measure the mutually beneficial impact of investments and avoid maladaptation to climate change.
- Debt reduction should be considered as part of DRR measures given the high levels of indebtedness SIDS face.
- There should be flexibility on the part of donors and national governments to integrate DRR into other financing windows: e.g., for biodiversity protection, sustainable land management, (nature-based solutions), agricultural development, and conflict prevention.

### **Capacity**

SIDS face tremendous challenges in generating and retaining capacity. The first challenge is that of **human resources**: there are limited job opportunities, challenges in retaining skilled staff including due to emigration ("brain drain"), small populations from which to draw expertise, which result in a limited number of qualified staff working in key capacities. In many countries, there are few people carrying out numerous

<sup>348</sup>ADB. 2020. Financing Disaster Risk in Asia and the Pacific: A Guide for Policy Makers. Available online at: <https://www.adb.org/sites/default/files/institutional-document/670596/financing-disaster-risk-reduction-asia-pacific.pdf>

<sup>349</sup>ECLAC/UN. 2021. An Innovative Financing for Development Agenda for the Recovery in Latin America and the Caribbean. Available online at: [https://repositorio.cepal.org/bitstream/handle/11362/47490/S2100627\\_en.pdf?sequence=3&isAllowed=y](https://repositorio.cepal.org/bitstream/handle/11362/47490/S2100627_en.pdf?sequence=3&isAllowed=y)



tasks, while lack of staffing results in losing out on opportunities to attract concessional financing, monitor projects, design initiatives, consult with stakeholders, and poses challenges in processing and coordinating international aid and post-disaster efforts. There is a reliance on consultants and volunteers, which can mean high turnover, ongoing training costs, and inconsistency. Further, financing for risk reduction, including planning for risk-informed recovery requires data, modelling, long-term planning, cost analyses, many of which are difficult with limited staff, especially when confronted with immediate response and recovery efforts. DRR requires a range of analytical expertise which may be difficult to attract and retain.

In terms of **data generation and analysis**, SIDS face a lack of storage and access to data, a lack of digitization, and difficulty in generating and accessing cross-sectoral data. DRR-related data is generally not standardized, and there is a shortage of skilled human capital to manage data technologies. Project-based culture in SIDS further fosters disparate and disaggregated pools of information, which does not allow lessons learned to be upscaled. Some SIDS face data privatization (e.g. telecommunications), and many are inundated with many interoperable portals, databases, and too much content that is not user-friendly. Many SIDS are unaware of all the DRR and climate-related data available and may not be sufficiently leveraging information from regional hubs, research institutes, and meteorological centers.

In terms of specific **data and information needs**, SIDS have expressed the need for additional data on assessing loss and damage, hazard and vulnerability assessments, and vulnerability and risk mapping and environmental impacts. Some SIDS lack historical data—others do not have DRR-related data in digitized form, and there is a general demand for stronger baseline data. Overall support is required to increase risk analysis and develop a better understanding of systemic and multi-hazard risk to inform policy-making. Down-scaled data and applied data is missing for many SIDS. Indigenous knowledge is not sufficiently leveraged to inform DRR measures—some SIDS are missing out on indigenous and citizen science that could improve DRR interventions. Finally, there is a lack of data on the investment potential of DRR which could otherwise be used to attract funds and action on DRR measures.

SIDS' potential to **access technology** and innovation has grown through projects, partnerships and technology investments.

However, SIDS generally require improvement in: (i) hydrometeorological hazard monitoring, forecasting infrastructure and technologies; (ii) the expansion of observing and monitoring networks; (iii) telecommunication systems; and (iv) hydrological and meteorological data and related hazard data collection, storage, processing, management and transmission systems. Technologies and systems for now-casting, such as radar systems and lightning detectors, to monitor moving severe weather events such as lightning, thunderstorms, heavy and intense rainfall, are also necessary as climate change increases frequency of heavy rains.

There are several **barriers to optimizing technologies**: Maintenance costs, upgrading, and asset deterioration is costly for countries. Often there is a dependency on donors for technologies which can lead to procurement delays, expiration of warranties, and the need for tandem trainings which may themselves be delayed or insufficient. There is a dependency on regional hubs for data, if those are available. There are logistical challenges of internet connectivity, of remote weather stations and technologies being damaged by extreme events. SIDS have to contend with intellectual property issues and obsolescence, and often interoperable baseline technologies are needed to accommodate new technologies or systems.

**Communications and infrastructure** are a key part of supporting DRR; remoteness, geographic dispersion and dependency on few communications cables leaves SIDS highly dependent on communications infrastructure. Addressing vulnerability of communications systems is critical as hazards may cut SIDS off from other countries and resources, depriving populations of warnings, support and essential services. Critical infrastructure such as transportation systems, power lines, pipelines, and reservoirs are at risk of natural hazards, and this is exacerbated by aging infrastructure, poor maintenance and reinforcement, and the establishment of telecommunications infrastructure in hazard-prone areas.

#### **Recommendations on capacity issues**

- Greater alignment and/or partnerships are needed between national DRR needs and tertiary education institutions to identify short-, medium- and long-term gaps, and to formulate related skills development plans. Many SIDS have tertiary institutions that can foster expertise that is needed at a national scale, but complementarity, funding, and recognition of national certification is needed. development arena.

- Flexible arrangements among donors and technical support facilities are needed to build capacity of a larger and diverse pool of staff. There are sometimes gender or number limitations, with SIDS only being able to recommend 1 or 2 people in key trainings. Training of trainers, or the inclusion of more people will allow skills development for a larger number of staff, to offset high turnover or emigration. COVID-19 has demonstrated that some trainings can take place remotely and this should be leveraged as much as possible.
- Incentives for staff retention should be enacted, especially non-financial incentives in contexts where increasing salaries are not possible. Economic incentives and career opportunities abroad are a major reason why many leave their countries and innovative retention practices (e.g., recognition, paid holidays, career development and training, children's schooling) should be further developed.
- Preparing and upskilling current and future labour force should be a priority for green transition to sustainability and building resilience.
- Sustainability plans must accompany the acquisition of new technology.
- Reducing disaster risk must include cost-effective ways to future-proof new development and retrofit existing infrastructure to withstand current and emerging climate and disaster risks.
- Mapping exercises should be carried out to identify free global data available (providers and types of data available).

### **Institutional Constraints**

**Intersectoral mainstreaming of DRR remains a challenge** and DRR is often not regarded as a salient issue in non-emergency times. DRR does not carry the same political weight as climate change, and can be disregarded as a weather or disaster management issue. Mandates of reporting on DRR are often unclear and disaster management authorities typically have little to no enforcement capacity. Institutions have low absorptive potential for capacity building and data integration. Indigenous knowledge is not sufficiently integrated into national DRR policies, and indigenous participation may be limited to project design, without meaningful engagement of indigenous communities through the life of a project, and/or may only include the involvement of leadership and not necessarily the most marginalized.

**Monitoring and Reporting** on DRR/SDG indicators does not provide a fulsome picture of how countries are performing at the local level, as SIDS lack data and provide incomplete reports. Often reporting against the Sendai Framework is seen as the end, rather than the reporting guiding policy outcomes; often data is generated after the fact, for reporting processes, not for guiding policy-making. Disaster management authorities are often understaffed for monitoring. While DRR is an intersectoral issue other sectors tend not to monitor their DRR expenses or activities, and do not report them centrally. Reporting on the Sendai Framework Monitor is incomplete/skewed for most SIDS. For some, annual reporting on Targets E and F is too intensive and unrealistic, especially if some of the results are derived from 5-year projects or initiatives. In 2021, several SIDS reported that no data was submitted to the Sendai Framework Monitor for Target E. There are also many other frameworks and projects to report on which is labour-intensive for disaster management authorities. It is not always clear for countries on how aggregate findings from the Sendai Framework Monitor are used or should be applied.

### **Recommendations on institutional constraints**

- SIDS should strengthen strategic foresight capabilities to develop policymaking in the context of uncertainty to prepare for a variety of possible developments and support risk-informed decision-making. The recommendations outlined in the Secretary-General's Report on "Our Common Agenda" should be leveraged to conduct this work.
- Reporting on multiple international frameworks should be streamlined to avoid onerous labour on limited staff. Reporting requirements for international frameworks should take country circumstances into account. If reporting is consistently incomplete, reporting requirements should be re-considered.
- Reporting on international frameworks should not be the end goal; it is essential that reporting drive decision-making. SIDS need support to design reporting practices that inform national policy-making, rather than just fulfill international reporting requirements.
- The political salience of DRR needs to be increased in SIDS to promote intersectoral and whole-of-society support. This requires clear messaging on the centrality of DRR to sustainable development.

- Disaster statistics should be part of national statistics collection. Engagement of national statistical offices to validate and integrate Sendai Framework monitor data into official national statistics can enhance the use of disaster loss data by decision-makers in all sectors.

### Partnerships

Many SIDS benefit from partnerships, particularly at the regional level to strengthen DRR capacities. Some constraints exist and prevent the optimization of these MOI, including (i) lack of awareness of all the technology partnerships and collaborations available to them; (ii) staff and resource limitations to manage numerous partnerships; and (iii) lack of meaningful engagement with indigenous or marginalized communities, as well the private sector. There is also the tension that some projects may fund regional partnerships as opposed to financing national institutions which forgoes national capacity building.

### Recommendations on partnerships

- A mapping exercise of partnerships at the regional level to identify the scope of services, data, technology and financing support available to SIDS. Intersectoral focal points should be identified at the national level to liaise with specific partners, and to alleviate the burden on disaster management officials of managing multiple relationships. This exercise would also pinpoint any duplicative activities carried out with different partners.
- SIDS' monitoring capacity is low as per the reporting against the Sendai Framework. Partnerships should be leveraged to bolster monitoring capacity.

## 8.2 Key Messages

There are SIDS-specific needs that can be addressed to improve access to means of implementing the Sendai Framework. While it is understood that all needs cannot be addressed, and that SIDS vary in the level to which they experience these constraints, it is necessary to note the impediments to improve implementation and avoid cycles of unmet targets.

The following **key messages** can be used in various sustainable development fora to better integrate DRR and improve access of MOI for SIDS. These serve to summarize the challenges explored in the assessment, and to galvanize attention and promote cohesive responses to SIDS-specific challenges in the realm of DRR.

- > Donors and donor agencies must consider the multi-dimensional vulnerability that SIDS face in accessing concessional financing.
- > Debt reduction and restructuring should be integrated into DRR support to SIDS, given their high levels of indebtedness.
- > Risk transfer cannot substitute instruments that finance the reduction of existing risk and the prevention of new risk. International financial institutions, development banks, and the private sector should focus on DRR financing instruments that include risk reduction and prevention bonds, blended financing tools, pooled funds, guidance and methodologies to include DRR in decisions of business and institutional investors. Central banks and credit rating agencies should align strategies and operations with the Sendai Framework to ensure that they prioritize risk reduction for SIDS.
- > Application processes for concessional financing must be improved and simplified. Donors should harmonize templates and requirements to reduce time/labour costs which prevent SIDS from applying for available financing.
- > DRR projects must take into account high costs of project implementation in SIDS. Project management costs and fees need to be higher in SIDS to account for elevated cost of project delivery due to remoteness, geographic dispersion, and limited HR; co-financing requirements should be lower.
- > Dedicated disaster risk reduction financing strategies should be included and amalgamated in integrated national financing frameworks, with clear investment priorities.
- > SIDS would benefit much more from a programmatic approach with sustained accompaniment than from multiple short-term projects.
- > Climate adaptation financing should include DRR indicators and metrics to ensure value of investment. Climate financing can then contribute to long-term resilience, through supporting both adaptation and risk-reduction activities. This will allow SIDS to access more opportunities for DRR work, while supporting coherent and risk-informed adaptation.
- > Nature-based solutions are an integral part of DRR. In the post-2020 Biodiversity Framework context, there is an opportunity for SIDS to highlight the relevance of DRR to biodiversity protection and natural resources management. Funds made available through biodiversity financing windows, should be open to DRR financing for an integrated and risk-informed approach to sustainable development.

- Reducing disaster risk must include cost-effective ways to future-proof new development and retrofit existing infrastructure to withstand current and emerging climate and disaster risks.
- SIDS should be supported in collecting, formalizing, mainstreaming and disseminating best practices of indigenous and local practices, and integrating citizen science for more informed DRR measures.
- Reporting requirements for DRR activities need to be rethought for SIDS if year after year, incomplete data and information is submitted.

As countries “build back better” in the wake of the COVID-19 pandemic, recovery must be risk-informed in all sectors.

- The concrete progress on means of implementation for SIDS can be considered as an indicator to be measured in the follow-up to the MTR SF.

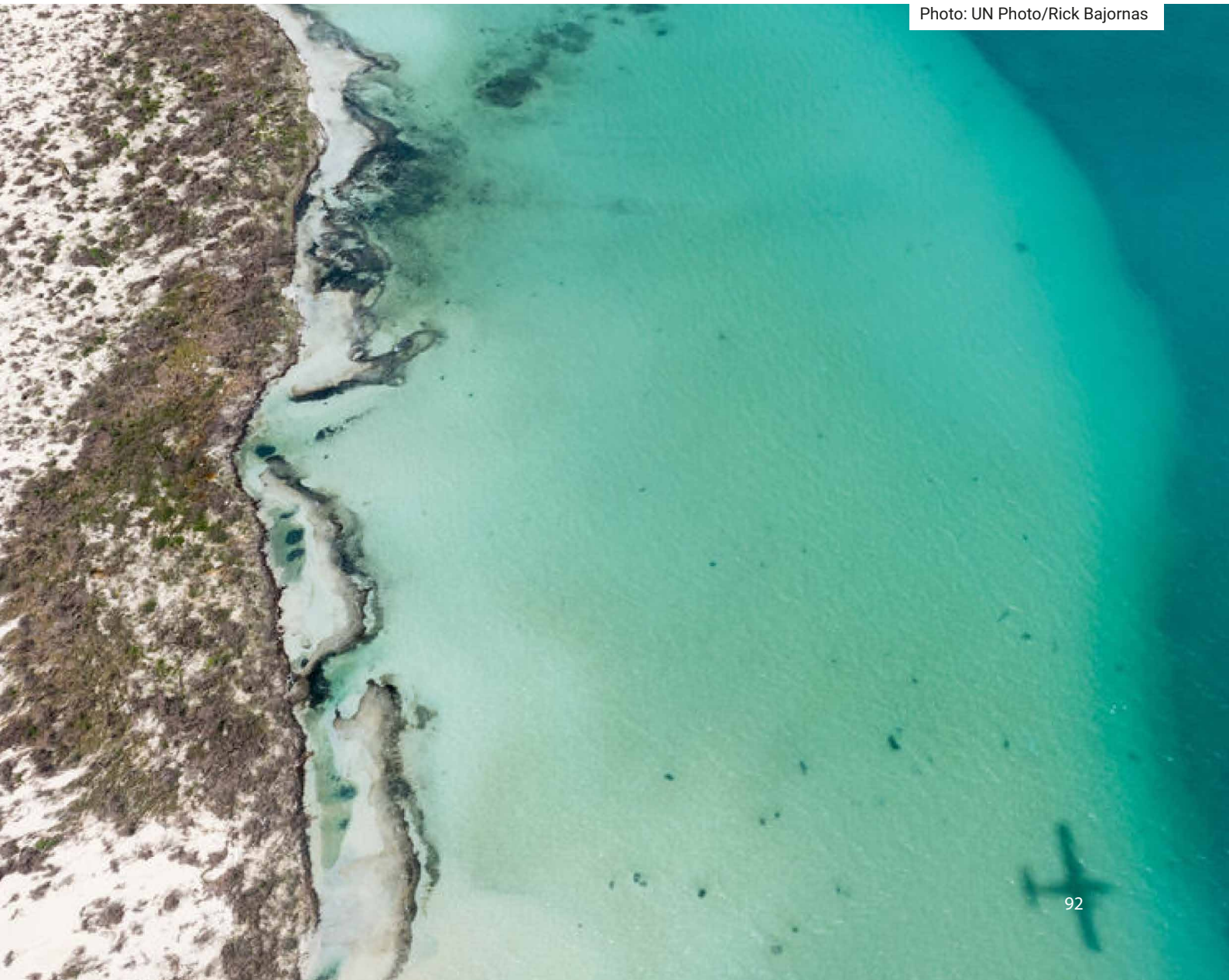


Photo: UN Photo/Rick Bajornas

# ANNEX 1. WORKS CITED

---

ADB. 2020. Financing Disaster Risk Reduction in Asia and the Pacific. Available online at: <https://www.adb.org/sites/default/files/institutional-document/670596/financing-disaster-risk-reduction-asia-pacific.pdf>

AOSIS. 2021. Leaders' Declaration 2021. Available online at: <https://www.aosis.org/launch-of-the-alliance-of-small-island-states-leaders-declaration/>

AOSIS. 2021. The Small Islands Climate Plan: SIDS Package. Available online at: <https://www.aosis.org/the-small-islands-climate-plan-sids-package/>

AOSIS. 2022. Global Environment Facility Dedicates a Climate Fund for SIDS. Available online at: <https://www.aosis.org/global-environment-facility-dedicates-a-climate-fund-for-sids/>

AOSIS. About Small Island Developing States. Available online at: <https://www.un.org/ohrls/content/about-small-island-developing-states>

Baldacchino, G. 2014. Small Island States; Vulnerable, Resilient, Doggedly Perseverant or Cleverly Opportunistic? In *Études Caribéennes*. Issue 27-28. Available online at: <https://journals.openedition.org/etudescaribeennes/6984>

CBD. The Ecosystem-Based Approach Has Been Recognized as An Important Strategy for Disaster Risk Reduction. Available online at: <https://www.cbd.int/article/biodiversityagainstclimatechange-1#:~:text=Examples%20of%20ecosystem%2Dbased%20disaster,ecosystems%20to%20complement%2C%20protect%20and>

CCRIF. Who We Are. Available online at: [https://www.ccrif.org/?language\\_content\\_entity=en](https://www.ccrif.org/?language_content_entity=en)

CIF. 2021. Learning Review of CIF-Supported Hydromet and Climate Services Project. Available online at: [https://www.climateinvestmentfunds.org/sites/cif\\_enc/files/knowledge-documents/learning\\_review\\_of\\_cif\\_supported\\_hydromet\\_and\\_climate\\_services\\_projects.pdf](https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/learning_review_of_cif_supported_hydromet_and_climate_services_projects.pdf)

Deo, A., Chand, S.S., McIntosh, R.D. et al. 2022. Severe tropical cyclones over southwest Pacific Islands: economic impacts and implications for disaster risk management. *Climatic Change* 172, 38. Available online at: <https://link.springer.com/article/10.1007/s10584-022-03391-2#citeas>

DGFF. 2021. UNCTAD Development and Globalization: Facts and Figures. Available online at: <https://dgff2021.unctad.org/>

Donback, N. 2020. What We Can Learn from Disaster Risk Reduction Efforts in Small Islands. Available online at: <https://www.devex.com/news/what-we-can-learn-from-disaster-risk-reduction-efforts-in-small-islands-96072>

ECLAC. 2020. The Use of Technology and Innovative Approaches in Disaster and Risk Management: A Characterization of Caribbean Countries' Experiences. Available online at: [https://www.cepal.org/sites/default/files/publication/files/45990/S2000547\\_en.pdf](https://www.cepal.org/sites/default/files/publication/files/45990/S2000547_en.pdf)

ECLAC/German Cooperation/UN. 2020. Planning for Disaster Risk Reduction within the Framework of the 2030 Agenda for Sustainable Development. Available online at: [https://repositorio.cepal.org/bitstream/handle/11362/46639/1/S2000452\\_en.pdf](https://repositorio.cepal.org/bitstream/handle/11362/46639/1/S2000452_en.pdf)

EU/ClimateAdapt. 2021. Establishing Early Warning Systems. Available online at: <https://climate-adapt.eea.europa.eu/metadata/adaptation-options/establishment-of-early-warning-systems>

GCF. 2020. Independent Evaluation of the Relevance and Effectiveness of the Green Climate Fund's Investments in Small Island Developing States. Available online in: <https://ieu.greenclimate.fund/sites/default/files/document/201123-sids-final-report-top-web.pdf>

GCF. 2017. Enhancing Early Warning Systems to Build Greater Resilience to Hydro and Meteorological Hazards in Pacific Small Island Developing States (SIDS). Available online: <https://www.greenclimate.fund/sites/default/files/document/ppf-application-enhancing-early-warning-systems-build-greater-resilience-hydro-and-meteorological.pdf>

GEF. GEF and Small Island Developing States. Available online at: <https://openknowledge.worldbank.org/bitstream/handle/10986/14831/333380ENGLISH0GEF1SIDS.pdf?sequence=1&isAllowed=y>

GEF/FAO. 2020. "BIOREACH: Biodiversity Conservation and Agroecological Land Restoration in Productive Landscapes of Trinidad and Tobago" project.

GIZ. Post-PAM: Lessons Learned for Development Cooperation in Vanuatu and the Pacific. Available online at: <https://www.adaptationcommunity.net/wp-content/uploads/2017/05/PostPam-Study.pdf>

Gheuens, J., Nagabhatla, N. and Perera, E.D.P. 2019. "Disaster-Risk, Water Security Challenges and Strategies in Small Island Developing States (SIDS)" Water 11, no. 4. Available online at: <https://www.mdpi.com/2073-4441/11/4/637#cite>

Glasser, R. 2020. Beyond Sendai in A Pacific Disaster Prevention Review. Edited by P. Barnes. Australian Strategic Policy Institute. Available online at: <http://www.jstor.org/stable/resrep25128.5>

Gounder, R. 2020. Economic Vulnerabilities and Livelihoods: Impact of COVID-19 in Fiji and Vanuatu. Oceania, Vol. 90, Issue 1. Available online at: <https://onlinelibrary.wiley.com/doi/10.1002/ocea.5273>

Government of Fiji. 2018. Fiji Sovereign Green Bond: Impact Report. Available online at: <https://fijiclimatchangeportal.gov.fj/wp-content/uploads/2021/12/Fiji-Sovereign-Green-Bond-Impact-Report-2018-FINAL.pdf>

Government of Tuvalu. Tuvalu Strategic Roadmap for Emergency Management 2021-2023: Strengthening Emergency Management Performance Through Sector Coordination and Cooperation. Available online at: [https://spccfpstore1.blob.core.windows.net/digitallibrary-docs/files/22/224d1edea2f6f6e556afeb16209018c8.pdf?sv=2015-12-11&sr=b&sig=zUTu%2FDt%2FhxJyTbCOItM3%2FRUwqipNruOLQfZ4OUsBte0%3D&se=2023-01-31T17%3A23%3A18Z&sp=r&rsc=public%2C%20max-age%3D864000%2C%20max-stale%3D86400&rsct=application%2Fpdf&rscd=inline%3B%20filename%3D%22Tuvalu\\_SREM\\_Final\\_2021\\_full\\_version.pdf%22](https://spccfpstore1.blob.core.windows.net/digitallibrary-docs/files/22/224d1edea2f6f6e556afeb16209018c8.pdf?sv=2015-12-11&sr=b&sig=zUTu%2FDt%2FhxJyTbCOItM3%2FRUwqipNruOLQfZ4OUsBte0%3D&se=2023-01-31T17%3A23%3A18Z&sp=r&rsc=public%2C%20max-age%3D864000%2C%20max-stale%3D86400&rsct=application%2Fpdf&rscd=inline%3B%20filename%3D%22Tuvalu_SREM_Final_2021_full_version.pdf%22)

GP2022. 23-28 May Summary Report GP2022. Available online at: <https://globalplatform.undr.org/news/23-28-may-2022-summary-report-gp2022>

Hare, B., Schleussner, C.F., Serdeczny, O., Saeed, F. Thomas, A., Zamarioli, L. 2017. A Year of Climate Extremes: A Case for Loss and Damage at Cop 23. Available online at: <https://climateanalytics.org/blog/2017/a-year-of-climate-extremes-a-case-for-loss-damage-at-cop23/#fn4889688486169db910c28e-1>

Hook, S. 2021. Disaster Risk Financing for Small Island Developing States. Available online at: [https://sdgs.un.org/sites/default/files/2022-01/Disaster\\_Risk\\_Financing\\_forSIDS\\_DraftFinalReport.pdf](https://sdgs.un.org/sites/default/files/2022-01/Disaster_Risk_Financing_forSIDS_DraftFinalReport.pdf)

Howell, J. 2022. Green bonds are big business for climate investors. GreenBiz. Available online at: <https://www.greenbiz.com/article/green-bonds-are-big-business-climate-investors#:~:text=To%20date%2C%20the%20global%20green,the%20total%20is%20%24313%20billion>

IDB. 2020. Weathering the Coronavirus Storm in the Caribbean. Available online at: <https://www.iadb.org/en/improvinglives/weathering-coronavirus-storm-caribbean>

IISD. Conferences of the Sustainable Development of Small Island Developing States. Available online at: <https://enb.iisd.org/negotiations/conferences-sustainable-development-small-island-developing-states-sids>

IISD. 2018. DESA Reviews Status, Priorities, and Challenges of SIDS Partnerships. Available online at: <https://sdg.iisd.org/news/desa-reviews-status-priorities-and-challenges-of-sids-partnerships/>

IISD. 2019. High-Level Review Calls for Increased Support for SIDS' Disaster Management, Sustainable Development. Available online at: <https://sdg.iisd.org/news/high-level-review-calls-for-increased-support-for-sids-disaster-management-sustainable-development/>

IISD. 2021. Disaster Risk Reduction in an Unstable World. Available online at: <https://www.iisd.org/articles/disaster-risk-reduction>

IISD. Mead, L. 2021. Small Islands, Large Oceans: Voices on the Frontlines of Climate Change. Available online at: <https://www.iisd.org/system/files/2021-03/still-one-earth-SIDS.pdf>

IISD. 2022. Report of the Main Proceedings for 26 May 2022: Mid-Term Review Plenaries. 7th Session of the Global Platform for Disaster Risk Reduction (GP2022). Available online at: <https://enb.iisd.org/global-platform-disaster-risk-reduction-gp2022-daily-report-26may2022>

IMF. 2020. World Economic Outlook Database. Available online at: <https://www.oecd.org/coronavirus/policy-responses/covid-19-pandemic-towards-a-blue-recovery-in-small-island-developing-states-241271b7/#section-d1e309>

Immarsat. 2022. Case study: NIWA and Inmarsat enable real-time weather monitoring across the Tonga archipelago in the South Pacific. Available online at: <https://www.inmarsat.com/en/insights/enterprise/2022/case-study-niwa-real-time-weather-monitoring.html>

IPCC. 2021. Small Islands in IPCC WGII Sixth Assessment Report. Available online at: [https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC\\_AR6\\_WGII\\_FinalDraft\\_Chapter15.pdf](https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_Chapter15.pdf)

Kuruppu, N. & Willie, R. 2015. Barriers to reducing climate enhanced disaster risks in Least Developed Country-Small Islands through anticipatory adaptation in Weather and Climate Extremes Vol.7. Available online at: <https://www.sciencedirect.com/science/article/pii/S2212094714000504>

LACCOM. 2022. St. Vincent and the Grenadines. Available online at: <https://lacom.georgetown.domains/saint-vincent-and-the-grenadines/>

Lee, YY., Kim, W., Sohn, S.J. et al. 2022. Advances and challenges of operational seasonal prediction in Pacific Island Countries. Sci Rep 12. Available online at: <https://www.nature.com/articles/s41598-022-15345-w>

Lucatello, S. & Alcantara-Ayala, I. 2022. Addressing the Interplay of the Sendai Framework with Sustainable Development Goals in Latin America and the Caribbean: Moving Forward or Going Backwards? Available online at: <https://www.undrr.org/publication/addressing-interplay-sendai-framework-sustainable-development-goals-latin-america-and>

Morris, R., Cattaneo, O., Poensgen, K. 2019. Transition Finance in Least Developed Countries and Small Island Developing States: Cabo Verde Country Pilot. Organisation for Economic Cooperation and Development: Paris. Available online at: <https://doi.org/10.1787/1affcac6-en>

Nalau, J., McNaught, R., Dalesa, M. 2020. Vanuatu in A Pacific Disaster Prevention Review, edited by Paul Barnes. Australian Strategic Policy Institute. Available online at: <http://www.jstor.org/stable/resrep25128.5>

Nevill, J. Eco-Tourism as a Source of Funding to Control Invasive Alien Species: The Case of Seychelles in International Journal of Island Affairs. Available online at: <https://www.cbd.int/doc/ref/island/insula-ecotour-en.pdf>

OCHA. 2021. GCF Boosts Early Warning Systems to Avert Climate-Related Disasters. Available online at: <https://reliefweb.int/report/world/gcf-boosts-sids-early-warning-systems-avert-climate-related-disasters>

OECD/World Bank/GFDRR. 2016. Climate and Disaster Financing in Small Island Developing States. Available online at: <https://reliefweb.int/report/world/climate-and-disaster-resilience-financing-small-island-developing-states>

OECD. 2018. Making Development Co-Operation Work for Small Island Developing States. OECD Publishing, Paris. Available online at: <https://www.oecd.org/dac/making-development-co-operation-work-for-small-island-developing-states-9789264287648-en.htm>

OECD. 2020. Strategic Foresight for the COVID-19 Crisis and Beyond: Using Futures Thinking to Design Better Public Policies. Available online at: <https://www.oecd.org/coronavirus/policy-responses/strategic-foresight-for-the-covid-19-crisis-and-beyond-using-futures-thinking-to-design-better-public-policies-c3448fa5/>

OECD. 2021. The Impact of the COVID-19 Crisis on External Debt in Small Island Developing States. Available online at: [https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states\(SIDS\).pdf](https://www.oecd.org/dac/financing-sustainable-development/External-debt-in-small-island-developing-states(SIDS).pdf)

OECD. 2021. COVID-19 Pandemic: Towards a Blue Recovery in Small Island Developing States. Available online at: <https://www.oecd.org/coronavirus/policy-responses/covid-19-pandemic-towards-a-blue-recovery-in-small-island-developing-states-241271b7/>

OECD. 2022. Small Island Developing States-SIDS. Available online at: <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/small-island-developing-states.htm>

OECD/World Bank/GFDRR. 2016. Climate and Disaster Financing in Small Island Developing States. Available online at: <https://reliefweb.int/report/world/climate-and-disaster-resilience-financing-small-island-developing-states>

OECS. 2021. The Dual Assault of the Pandemic and Volcano Eruption Has Sparked the Need for Greater Caribbean Integration. Available online at: <https://reliefweb.int/report/world/dual-assault-pandemic-and-volcano-eruption-has-sparked-need-deeper-caribbean-regional>

Osifelo, E. & Martin, L. 2019. Solomon Islands Struggle with Nation's Worst Oil Spill in The Guardian. Available online at: <https://www.theguardian.com/environment/2019/mar/06/solomon-islanders-suffer-worst-oil-spill-nations-history-bulk-carrier-bauxite>

Olds, K. 2007. Global assemblage: Singapore, foreign universities, and the construction of a "global education hub". World Dev. 35, 959–975.

Petrova, D. & Dan, M.B. 2020. Natural Hazard Impacts on Technological Systems and Infrastructures in Nat. Hazards Earth Syst. Sci., 20. Available online at: <https://nhess.copernicus.org/articles/20/2627/2020/nhess-20-2627-2020.pdf>

Quak, E. 2019. How Losing Access to Concessional Finance Affects Small Island Developing States. Available online at: [https://assets.publishing.service.gov.uk/media/5d41b473ed915d09de9d1af4/626\\_SIDS\\_graduation\\_im\\_pacts\\_losing\\_concessional\\_finance.pdf](https://assets.publishing.service.gov.uk/media/5d41b473ed915d09de9d1af4/626_SIDS_graduation_im_pacts_losing_concessional_finance.pdf)

Queen's University. How Green Bonds Work. Available online: <https://smith.queensu.ca/insight/content/how-green-bonds-work.php>

Reuters. 2021. Analysis: Belize Offers Ocean Blue Print with Debt for Reef Swap. Available online at: <https://www.reuters.com/business/cop/belize-offers-ocean-blue-print-with-debt-for-reef-swap-2021-11-05/>



Schimel, A. & Holland, E. 2020. Tonga: A Pacific Disaster Prevention Review, edited by Paul Barnes. Australian Strategic Policy Institute. Available online at: <http://www.jstor.org/stable/resrep25128.5>

Shultz, J.M., Cohen, M.A., Hermosilla, S., Espinel, Z., McLean, A. 2016. Disaster risk reduction and sustainable development for small island developing states. *Disaster Health*; 3(1)

SPREP. Pacific Islands Meteorological Services in Action: A Compendium of Climate Services Case Studies. Available online at: [https://library.wmo.int/doc\\_num.php?explnum\\_id=3394](https://library.wmo.int/doc_num.php?explnum_id=3394)

Sustainable Hospitality Alliance. Climate Action. Available online at: <https://sustainablehospitalityalliance.org/our-work/climate-action/>

Thomas, A., Baptiste, A., Martyr-Koller, R., Pringle, P., Rhioney, K. 2020. Climate change and Small Island Developing States. *Annual Review of Environment and Resources*, 45(6). Available online at: <https://www.annualreviews.org/doi/10.1146/annurev-enviro-012320-083355>

Thomas, A., Theokritoff, E. 2021. Debt-for-climate swaps for small islands. In *Nat. Clim. Chang.* 11. Available online at: <https://www.nature.com/articles/s41558-021-01194-4#citeas>

Trotman, A., Mahon, R., Van Meerbeeck, C., Riley, J.E., et al. Advancing Drought Risk Management in the Caribbean: A Multi-Sectoral Perspective. Available online at: [https://www.preventionweb.net/files/78462\\_cs5.gar21caribbeandroughtcasestudyf.pdf](https://www.preventionweb.net/files/78462_cs5.gar21caribbeandroughtcasestudyf.pdf)  
[https://www.preventionweb.net/files/78462\\_cs5.gar21caribbeandroughtcasestudyf.pdf](https://www.preventionweb.net/files/78462_cs5.gar21caribbeandroughtcasestudyf.pdf)

UN. Sendai Framework for Disaster Risk Reduction 2015-2030. Available online at: [https://www.preventionweb.net/files/43291\\_sendaiframeworkfordrren.pdf](https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf)

UN. 2019. High-Level Political Declaration on the Midterm Review of the SAMOA Pathway. Available online at: <https://www.un.org/pga/73/wp-content/uploads/sites/53/2019/08/SAMOA-MTR-FINAL.pdf>

UN. 2021. Our Common Agenda- Report of the Secretary General. Available online at: [https://www.un.org/en/content/common-agenda-report/assets/pdf/Common\\_Agenda\\_Report\\_English.pdf](https://www.un.org/en/content/common-agenda-report/assets/pdf/Common_Agenda_Report_English.pdf)

UN. 2022. High Level Panel on the Development of a Multidimensional Vulnerability Index: Interim Report. Available online at: [https://sdgs.un.org/sites/default/files/2022-08/MVI\\_Interim\\_Report\\_%20Final.pdf](https://sdgs.un.org/sites/default/files/2022-08/MVI_Interim_Report_%20Final.pdf)

UN. 2022. UN Marks Anniversary of Devastating 2010 Haiti Earthquake in UN News. Available online at: <https://news.un.org/en/story/2022/01/1109632#:~:text=On%2012%20January%202010%2C%20a,%2C%20known%20as%20MINUSTAH%2C%20collapsed>

UN. 2015. Addis Ababa Action Agenda of the Third International Conference on Financing for Development. Available online at: [https://sustainabledevelopment.un.org/content/documents/2051AAAA\\_Outcome.pdf](https://sustainabledevelopment.un.org/content/documents/2051AAAA_Outcome.pdf)

UNCDF. 2021. COP 26- United Kingdom, UN Agencies, Welcome Fiji's Plans to Issue Sovereign Blue Bonds in 2022. Available online at: <https://www.uncdf.org/article/7298/cop26-united-kingdom-un-agencies-welcome-fijis-plans-to-issue-sovereign-blue-bonds-in-2022>

UNCTAD. 2004. Is a Special Treatment of Small Island Developing States Possible? Available online at: [https://unctad.org/system/files/official-document/ldc20041\\_en.pdf](https://unctad.org/system/files/official-document/ldc20041_en.pdf)

UNCTAD. 2020. Multiple Disasters and Debt Sustainability in Small Island Developing States. UNCTAD Research Paper No 55. Available online at: [https://unctad.org/system/files/official-document/ser-rp-2020d14\\_en.pdf](https://unctad.org/system/files/official-document/ser-rp-2020d14_en.pdf)

UNCTAD. 2021. Building Resilience in Small Island Developing States. Available online at: [https://unctad.org/system/files/official-document/aldcinf2021d3\\_en.pdf](https://unctad.org/system/files/official-document/aldcinf2021d3_en.pdf)

UNCTAD. 2022. Climate Financing for SIDS is Shockingly Low: Why This Needs to Change. Available online at: <https://unctad.org/news/climate-finance-sids-shockingly-low-why-needs-change>

UN DESA. 2021. Risk-Informed Finance. Available online at: <https://www.un.org/development/desa/dpad/publication/un-desa-policy-brief-98-risk-informed-finance/>

UN DESA. Transforming Our World: The 2030 Agenda for Sustainable Development. Available online at: <https://sdgs.un.org/2030agenda>

UN DESA. Capacity Development. Available online: <https://www.un.org/development/desa/cdpmo/what-we-do/areas-of-work/means-of-implementation#:~:text=The%20notion%20of%20'Means%20of,capacity%E2%80%90building%2C%20inclusive%20and%20equitable>

UN DESA. Small Island Developing States: Genuine and Durable Partnerships for the Sustainable Development of Small Island Developing States. Available online at: <https://sdgs.un.org/partnerships/action-networks/sids-partnerships>

UNDP. 2017. Evaluation: "Strengthening resilience and coping capacities in the Caribbean through integrated early warning systems" Available online at: <https://www.undp.org/content/dam/rblac/docs/Research%20and%20Publications/Repository/Barbados/UNDP-RBLAC->

UNDP. Assa, J. & Meddeb, R. 2021. Towards a Multidimensional Vulnerability Index. Available online at: <https://www.undp.org/publications/towards-multidimensional-vulnerability-index#modal-publication-download>

UNDP. 2022. New Automatic Weather Station to Enhance Palau's Climate Monitoring Capacities. Available online at: <https://www.undp.org/pacific/press-releases/new-automatic-weather-station-enhance-palaus-climate-monitoring-capacities>

UNDP. Meddeb, R. Small Island Developing States do not Have the Luxury of Time. Available online at: <https://www.undp.org/blog/small-island-developing-states-do-not-have-luxury-time>

UNDP. Lopez-Calva, L. 2018. Finance, Partnerships and Innovation: Large Ocean States Pave the Way to the 2030 Agenda. Available online at: <https://www.undp.org/blog/finance-partnerships-and-innovation-large-ocean-states-pave-way-2030-agenda>

UNDRR. 2015. Local Knowledge Saves Lives in Vanuatu. Available online at: <https://www.undrr.org/news/local-knowledge-saves-lives-vanuatu>

UNDRR. 2019. Disaster Risk Reduction in Republic of Maldives. Available online at: [https://www.preventionweb.net/files/68254\\_682304maldivesdrmstatusreport.pdf](https://www.preventionweb.net/files/68254_682304maldivesdrmstatusreport.pdf)

UNDRR. 2021. International Cooperation in Disaster Risk Reduction, United Nations Office for Disaster Risk Reduction.

UNDRR. 2021. Policy Brief: Financing Prevention and De-Risking Investment. Available online at: [https://globalplatform.undrr.org/sites/default/files/2022-04/UNDRR\\_Policy\\_Brief\\_Financing\\_prevention\\_and\\_de\\_risking\\_investment\\_FINAL%20%281%29.pdf](https://globalplatform.undrr.org/sites/default/files/2022-04/UNDRR_Policy_Brief_Financing_prevention_and_de_risking_investment_FINAL%20%281%29.pdf)

UNDRR. 2021. SRSG Mizutori's Remarks at Early Warnings for Small Island Developing States-Bridging the Capacity Gap by 2030- COP 26 Side Event. Available online at: <https://www.undrr.org/news/srsg-mizutori-s-remarks-early-warnings-small-island-developing-states-bridging-capacity-gap>

UNDRR. 2021. Target E: Disaster Risk Reduction Strategies Analytics. Available online: <https://sendaimonitor.undrr.org/analytics/global-target/17/6>

UNDRR. 2022. Global Assessment Report on Disaster Risk Reduction: Our World at Risk: Transforming Governance for a Resilient Future. Available online: <https://www.undrr.org/gar2022-our-world-risk#container-downloads>

UNDRR. 2022. Sendai Framework Voluntary Commitments Synthesis and Analysis Report. Available online at: <https://www.undrr.org/publication/sendai-framework-voluntary-commitments-synthesis-and-analysis-report-2022>

UNDRR. 2022. What the Tonga Disaster Tells Us About the South Pacific's Cyber Resilience. Available online at: <https://www.preventionweb.net/news/what-tonga-disaster-tells-us-about-south-pacifics-cyber-resilience>

UNDRR. Understanding Disaster Risk. Available online at: <https://www.preventionweb.net/understanding-disaster-risk/risk-drivers/climate-change>

UNDRR/CREWS/WMO. 2022. Caribbean Workshop: Measuring Effectiveness of Early Warning Systems through Sendai Framework Target (g) and Custom Indicators. Available online at: <file:///Users/erumshaziahasan/Downloads/MHEWS%20Workshop%20Report.pdf>

UNDRR/ISC/RISKKAN. 2022. Systemic Risk: Review and Opportunities for Research Policy and Practice from the Perspective of Climate, Environmental and Disaster Risk Science and Management. Available online at: <https://www.undrr.org/publication/briefing-note-systemic-risk>

UNEP. 2018. Macaya Grand Sud-Phase II Project Document.

UNEP. 2014. Emerging issues for Small Island Developing States. Results of the UNEP Foresight Process. United Nations Environment Programme (UNEP), Nairobi, Kenya.

UNEP/OCHA/UNDP. 2013. Environmental Emergencies Comoros: Report of Scoping Mission. Available online at: <http://www.eccentre.org/wp-content/uploads/2019/06/Report-EE-Mission-Comoros-FINAL-2013.pdf>

UN-ESCAP. Ocean Accounting for Disaster Resilience in the Pacific SIDS. Available online at: <https://drrgateway.net/disaster-risk-reduction/Ocean-Accounting-for-Disaster-Resilience-in-the-Pacific-Sids>

UNESCO. Disaster Risk Reduction. Available online at: <https://en.unesco.org/disaster-risk-reduction>

UNFCCC. 2020. A Threat and a Solution: Tourism's Role in Mangrove Protection. Available online at: <https://climatechampions.unfccc.int/a-threat-and-a-solution-tourisms-role-in-mangrove-protection/>

UNGA. 2020. Seventy-fourth session Agenda item 19 (b) Sustainable development: follow-up to and implementation of the SIDS Accelerated Modalities of Action (SAMOA) Pathway and the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States Resolution A/RES/74/217. Available online at: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N19/435/95/PDF/N1943595.pdf?OpenElement>

UNISDR. 2012. The Pacific Experience in Developing Policy and Legislation on Disaster Risk Reduction and Climate Change Adaptation. Available online at: [https://www.unisdr.org/files/34003\\_34003pacificexperienceonlegislation.pdf](https://www.unisdr.org/files/34003_34003pacificexperienceonlegislation.pdf)

UN-OHRLS. 2021. Financing for Development in Small Island Developing States. Available online at: [https://www.un.org/ohrlls/sites/www.un.org.ohrlls/files/financing\\_for\\_development\\_for\\_sids\\_report\\_advance\\_unedited.pdf](https://www.un.org/ohrlls/sites/www.un.org.ohrlls/files/financing_for_development_for_sids_report_advance_unedited.pdf)

UNSD. SIDS Accelerated Modalities of Action (SAMOA) Pathway. Available online at: <https://sustainabledevelopment.un.org/samoapathway.html>

UNSDG. 1994. Barbados Programme of Action. Available online at: <https://sustainabledevelopment.un.org/conferences/bpoa1994>

UN SDKP. SIDS Accelerated Modalities of Action (S.A.M.O.A) Pathway. Available online at: <https://sustainabledevelopment.un.org/samoapathway.html>

UN-SPIDER. Satellite Telecommunications in Tsunami Early Warning Systems. Available online at: <https://www.un-spider.org/satellite-telecommunications-tsunami-early-warning-systems>

UNWTO. Small Island Developing States. Available online at: <https://www.unwto.org/sustainable-development/small-islands-developing-states#:~:text=They%20present%20three%20key%20characteristics,to%20strong%20tourism%20assets%20but>

WEF/EU/DANIDA. 2021. Country Financing for the SDGs: Saint Lucia, Insight Report. Available online at: [https://www3.weforum.org/docs/WEF\\_Country\\_Financing\\_Roadmap\\_for\\_the\\_SDGs\\_Saint\\_Lucia\\_2021.pdf](https://www3.weforum.org/docs/WEF_Country_Financing_Roadmap_for_the_SDGs_Saint_Lucia_2021.pdf)

WHO. 2021. SIDS Summit for Health: For a Healthy and Resilient Future in Small Island Developing States. Available online at: [https://cdn.who.int/media/docs/default-source/sids-summit/sids-health-systems-policy-brief.pdf?sfvrsn=b57828e8\\_5](https://cdn.who.int/media/docs/default-source/sids-summit/sids-health-systems-policy-brief.pdf?sfvrsn=b57828e8_5)

World Bank. 2018. Seychelles launches world's first sovereign blue bond. <https://www.worldbank.org/en/news/pressrelease/2018/10/29/seychelles-launchesworlds-first-sovereign-blue-bond>

World Bank. 2021. Together for Fiji: COVID-19 and the Road to Recovery. Available online at: <https://blogs.worldbank.org/eastasiapacific/together-fiji-covid-19-and-road-recovery#:~:text=According%20to%20the%20World%20Bank's,severe%20in%20the%20country's%20history>.

World Bank. 2022. Risk Insurance Builds Climate and Disaster Resilience in Central America and the Caribbean. Available online at: <https://reliefweb.int/report/world/risk-insurance-builds-climate-and-disaster-resilience-central-america-and-caribbean>

World Bank. 2022. Sovereign Blue Bond Issuance. Available online at: <https://www.worldbank.org/en/news/feature/2018/10/29/sovereign-blue-bond-issuance-frequently-asked-questions>

World Bank/GFDRR. 2016. Building Resilience – Integrating Climate and Disaster Risk into Development. Available online at: <https://www.gfdr.org/en/publication/building-resilience-integrating-climate-and-disaster-risk-development>

World Bank/GFDRR. 2020. Cabo Verde Emergency Preparedness and Response Diagnostic: Building a Culture of Preparedness.

World Bank/GFDRR. Climate Vulnerability Assessment: Making Fiji Climate Resilient. Available online at: <https://www.gfdr.org/en/fiji-climate-vulnerability-assessment>

WMO. 2022. Artificial Intelligence for Disaster Risk Reduction: Opportunities, Challenges and Prospects. Vol.71 (1). Available online at: <https://public.wmo.int/en/resources/bulletin/artificial-intelligence-disaster-risk-reduction-opportunities-challenges-and>

WMO/CREWS. 2017. "Supporting regional cooperation to strengthen seamless operational forecasting and multi hazard early warning systems at national level in the South-West Indian Ocean": Project Presentation Note. Available online at: [https://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocrews/s3fs-public/ckeditor/files/South-West\\_Indian\\_Ocean\\_-\\_CREWS\\_Proposal\\_3-final.pdf?OS7oFXrCT0Mp4\\_qGDppxuSFu3uCFReBB](https://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocrews/s3fs-public/ckeditor/files/South-West_Indian_Ocean_-_CREWS_Proposal_3-final.pdf?OS7oFXrCT0Mp4_qGDppxuSFu3uCFReBB)

Zitoun, R.; Sander, S.G.; Masque, P.; Perez Pijuan, S.; Swarzenski, P.W. 2020. Review of the Scientific and Institutional Capacity of Small Island Developing States in Support of a Bottom-up Approach to Achieve Sustainable Development Goal 14 Targets. *Oceans*, 1, 109-132. <https://doi.org/10.3390/oceans1030009>

# ANNEX 2. PARTICIPANTS AT REGIONAL WORKSHOPS

LAST NAME	FIRST NAME	COUNTRY OR INSTITUTION
Anglin	Karen	Jamaica
Baksh	Anwar	Trinidad and Tobago
Bent	Desmond	Jamaica
Bissessur	Heman	Mauritius
Blair	Tumasie	AOSIS
Brown	Nadine	Jamaica
Brown	Pauline	Jamaica
Chand	Perna	University of South Pacific
Curuki	Jale	Pacific Island Forum
Date	Bernice	Grenada
Dabrowka	Wojciech	Fiji
Edwards	Michelle	Jamaica
Emery	Gabrielle	UNDRR
Evans	William	Guyana
Faasau	Meiapo	IFRC
Forbes	Michelle	St. Vincent and the Grenadine
Gulston	Curmira	Trinidad and Tobago
Hanson	Laurel	UNDRR
Hasan	Erum	Consultant
Hemstock	Sarah	Consultant
Hinds	Kerry	Barbados
Hyacinth	Tonya	Grenada

LAST NAME	FIRST NAME	COUNTRY OR INSTITUTION
Innis-Springer	Evangeline	UWI
Jacot Des Combes,	Helene	Republic of Marshall Islands
Kioa	Moana	Tonga
Kontro	Maria	UNDRR
Lewis	Alana	UNDRR
Lionel	Sarah	WFP
Schiano Lomoriello	Roberto	UNDRR
Mangal	Bob	Suriname
Maughan	Juliette	WFP
Mitchell	Sophia	Jamaica
Morris	Cherie	University of South Pacific
Noel	Tamica	Guyana
October	Salim	Guyana
Pardo	Maximilien	UN DESA
Patterzon	Ivette	Suriname
Philoé	Veronique	Seychelles
Rachel	Aisha	Seychelles
Rhoden	Sandra	Jamaica
Robinson	Rhonda	Pacific Community
Salazar	Raul	UNDRR
Shurland	Deirdre	UNEP
Stoddard	Kenson	St. Vincent and the Grenadines
Doris Susau	Doris	Live and Learn Tuvalu
Taifiariki	Jonathan	Solomon Islands
Tellez Robayo	Camilo	UNDRR
Torres	Jair	UNDRR
Tucker-Abrahams	Anna	Jamaica
Yeta	Lopanga	Vanuatu
Zahir	Ismail	AOSIS
Civil Protection Agency (name unknown)		Timor Leste



**United  
Nations**

Copyright © United Nations,  
2022 All rights reserved