iied

Sinking islands, rising debts

Urgent need for new financial compact for Small Island Developing States

Ritu Bharadwaj, Tom Mitchell, N Karthikeyan and Balakrishnan Ananda Kumar

Working Paper
September 2023

Climate change

Keywords:
Social protection, climate resilience, climate finance, debt management and swaps, climate change justice

About the authors

Ritu Bharadwaj is a principal researcher in the Climate Change Group of the International Institute for Environment and Development.

Dr Tom Mitchell is the executive director of the International Institute for Environment and Development.

N Karthikeyan is a development economist who focuses on climate change, natural resource management, safe drinking water, sanitation, elderly care and microfinance.

Balakrishna Ananda Kumar is a finance and development professional with 23 years of expertise in the areas of accounting, taxation and quantitative analysis.

Corresponding author: Ritu Bharadwaj (ritu.bharadwaj@iied.org)

Acknowledgements

We thank the Climate Emergency Collaboration Group and our frame funders Irish Aid and Swedish International Development Cooperation Agency (Sida) for funding this research. We would like to extend special thanks to partners from Small Island Development States, development partners and multilateral leaders, particularly Tumasie Blair, Deputy Permanent Representative of Antigua and Barbuda to the United Nations, Simona Anamaria Marinescu, Senior Advisor, Small Island Developing States, UNOPS and Emily Wilkinson, Director, Resilient and Sustainable Islands (RESI), for providing their insights that have helped in shaping this paper. Thanks to Annette McGill for her support in copy editing the working paper. We would also like to thank Mette Groen, senior project manager and Martin Cummins, project manager, IIED, for managing the production of the working paper.

Produced by IIED's Climate Change Group

The Climate Change Group works with partners to help secure fair and equitable solutions to climate change by combining appropriate support for adaptation by the poor in low- and middle-income countries, with ambitious and practical mitigation targets. The work of the Climate Change Group focuses on achieving the following objectives:

- Supporting public planning processes in delivering climate-resilient development outcomes for the poorest
- Supporting climate change negotiators from poor and vulnerable countries for equitable, balanced and multilateral solutions to climate change
- Building capacity to act on the implications of changing ecology and economics for equitable and climate-resilient development in the drylands.

Published by IIED, September 2023

Bharadwaj, R, Mitchell, T, Karthikeyan N and Kumar, BA (2023) Sinking islands, rising debts: Urgent need for new financial compact for Small Island Developing States. IIED, London.

iied.org/21606IIED

ISBN 978-1-83759-046-9

Printed on recycled paper with vegetable-based inks.

International Institute for Environment and Development
Third Floor, 235 High Holborn, London WC1V 7DN, UK
Tel: +44 (0)20 3463 7399
www.iied.org

@iied
www.facebook.com/theIIED

Download more publications at https://iied.org/publications

Small Island Developing States (SIDS) are getting entrapped in financial quagmire due to climate impacts. This paper delves into the urgent financial plight of SIDS, examining the multifaceted challenges they face across social, environmental and economic domains. It argues for a comprehensive approach to debt relief, future protection, resilience investment and advisory support as necessary steps for the survival and sustainable development in these vulnerable regions.

Contents

Figures and tables

Acronyms

ADB	Asian Development Bank
AfDB	African Development Bank
AfDF	African Development Fund
AIMS	Atlantic, Indian Ocean, Mediterranean and South China Sea
AOSIS	Alliance of Small Island States
ARC	African Risk Capacity
BCR	Benefit–cost ratio
CARICOM	Caribbean Community
CCRIF	Caribbean Catastrophe Risk Insurance Facility
CV	Coefficient of variation
DR	Debt reprofiling
DS	Debt swap
DSA	Debt Sustainability Analysis
DSSI	Debt Service Suspension Initiative
EEZ	Exclusive Economic Zone
FDI	Foreign direct investment
GDP	Gross domestic product
GNI	Gross national income
HIPC	Heavily Indebted Poor Countries
IDA	International Development Association
IMF	International Monetary Fund
LDC	Least Developed Countries
LEP	Loss exceedance probability
MDRI	Multilateral Debt Relief Initiative
MVI	Multidimensional Vulnerability Index
NGO	Nongovernmental organisation
ODA	Official development assistance
PC	Pause clause
PCRAFI	Pacific Catastrophe Risk Assessment and Financing Initiative
PI	Parametric insurance
RB	Resilience bond
SAMOA	States Accelerated Modalities of Action
SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
UN	United Nations
UNCTAD	UN Conference on Trade and Development

Summary

Small Island Developing States (SIDS) are a widely varied group of countries spread across three major geographical regions — the Caribbean; the Pacific; and the Atlantic, Indian Ocean, Mediterranean and South China Sea (AIMS). While diverse in many respects, they share a complex set of social, environmental and economic challenges.

These challenges stem from their inherent characteristics: limited populations and confined land areas, widespread geographical separation, and often significant distances from key global markets. For many SIDS, the majority of the natural resources they access come from the ocean. Their narrow resource base compels them to rely heavily on external markets for many goods. Many SIDS grapple with high import and export costs because of this, which also makes them susceptible to sudden global economic or political crisis, and climate change impacts.

Traditional income-based measurements often don't capture the multifaceted vulnerabilities faced by SIDS. Many SIDS are classified as middle- or high-income countries, resulting in ineligibility for concessional financing. Eleven SIDS are considered high income, more than half are classified as middle income, and only eight nations are Least Developed Countries (LDCs). The high- and middle-income status of many SIDS greatly obscures the level of risk and vulnerability these countries face and overlooks their structural challenges.

Vulnerability profile of SIDS: a multidimensional perspective

Recognising these limitations, we have used the Multidimensional Vulnerability Index (MVI) approach to provide a more comprehensive and nuanced understanding of SIDS' vulnerabilities. Our assessment shows a striking similarity in the MVI of SIDS at 56.64 with LDCs at 55.70. SIDS also exhibit a lack of structural resilience, with a score of 59.00 and LDCs at 58.39, showing a limited capacity to withstand shocks like natural disasters or economic downturns. The MVI also reveals that all but five SIDS are far more vulnerable than their income level would suggest, and despite the similarity in their vulnerabilities, only eight SIDS are classified as LDCs.

Vulnerability to climate impacts

Even though SIDS contribute less than 1% to global greenhouse gas emissions, they are disproportionately affected by the climate crisis. They are particularly exposed to the devastating impacts of climate change due to their unique geographical characteristics. Many SIDS are situated in areas prone to tropical cyclones, and their remote locations and small economies hinder their ability to cope with these events. The vulnerability of islands with an elevation of only five or less metres above sea level is heightened by predicted sea level rises, posing an existential threat.

Disaster impact in SIDS: The data for SIDS shows an increasing trend of disaster intensity and frequency. The number of high-intensity disasters affecting SIDS have increased in the last three decades, with a 300% increase in 2012 and a 133.33% increase in 2020. After 2010, significant increases in mean intensity were recorded, including a 321.82% increase in 2015 and a 196.50% increase in 2020.

In comparison to other countries, SIDS and LDCs faced higher disaster intensity from 2010 to 2022, experiencing more intense disasters in eight (66.67%) and seven years (58.33%) respectively, compared to decades before that. During 1990–2009, the frequency of occurrence of high disaster intensity was only 25% in SIDS and 35% in LDCs.

From 2011 to 2022, the percentage of the population affected by disasters in SIDS showed a noticeable increase, with the last decade witnessing a significant rise of around 120%. Similarly, the trends in deaths per million of population in SIDS showed a noticeable increase of approximately 60% in the last decade.

Scale of climate impact on economy: What makes SIDS particularly vulnerable is the relative impact of natural disasters on their economies. Although the absolute financial losses from disasters might seem

small compared to larger countries, the relative effects on SIDS are immense. A single disaster can be catastrophic, wiping out essential industries, impacting entire islands, or destroying vital infrastructure without readily available alternatives. Globally, SIDS comprise two-thirds of the nations that experience the highest relative annual losses from natural disasters (1–9% of their gross domestic product (GDP)). Additionally, 14 out of the 20 countries with the highest average annual disaster losses relative to their GDP are SIDS. The impact on GDP due to weather, climate and water-related events on SIDS between 1970 and 2020, was US$153 billion — a considerable figure considering the average GDP of SIDS is US$13.7 billion. Our assessment shows that the damage caused by disasters as a percentage of GDP in SIDS increased by nearly 90% from 2011 to 2022.

Climate and debt profile

The International Monetary Fund (IMF) conducts Debt Sustainability Analysis (DSA) to assess a country's ability to meet its current and future debt obligations without needing drastic measures such as debt relief or significant balance of payments adjustments. The analysis covers key indicators, such as the debt-to-GDP ratio, fiscal deficit, external debt, and tax revenue volatility. We analysed these indicators for 33 SIDS for which most recent debt data was available.

Debt to GDP ratio: Overall, more than 40% of SIDS are either highly indebted or are pushing towards debt distress, and 70% are above the sustainability threshold of 40% of GDP as debt. Six countries have a debt-to-GDP ratio exceeding 100% — Dominica, Cabo Verde, Barbados, Suriname, Maldives, and Antigua and Barbuda. These countries are heading towards debt distress. Eight countries were found to be highly indebted with a debt-to-GDP ratio greater than 80% but less than 100%, including Mauritius and Saint Lucia, both of which have a ratio exceeding 90%. Countries that have a debt-to-GDP ratio ranging from 40% to 80% were classified as moderately indebted. There are nine countries in this group. There are only ten countries with a debt-to-GDP ratio below 40%.

External debt: SIDS often rely on external borrowing to finance development and respond to shocks. From 2011 to 2019, SIDS' average external debt fluctuated between 48% and 51% of gross national income (GNI), revealing a consistent reliance on external sources of financing. The consistent proximity to the 50% threshold highlights a precarious fiscal position that can be easily tipped into distress by external shocks or changes in global economic conditions, such as climate events, commodity price fluctuations, and shifts in global trade and finance. To further understand the impact of climate disasters on the SIDS' external debt, we examined the correlation between disaster intensity and external debt levels by comparing two distinct periods: Period I (2007–2009) of minimal disaster intensity, and Period II (2020–2021) of high disaster intensity. During Period I, the mean external debt of SIDS was 45.37%. Contrastingly, Period II, saw a rise in the mean external debt to 58.50%. Analysis of the two periods unearthed several key trends and observations. Nearly 70% of the countries experienced an increase in external debt, with some witnessing remarkable surges. For example, the Bahamas saw a 720.83% increase in debt, moving from 5.74% to 47.11%. Papua New Guinea also experienced a substantial rise of 379.03%, from 14.52% to 69.57%.

Fiscal deficit: The fiscal balance of a country plays a pivotal role in determining its financial health. The fiscal balance can manifest either as a surplus, when revenue exceeds expenditure, or as a deficit, when the opposite occurs. We compared fiscal balance as a percentage of GDP in SIDS during Period I (2007–2009) of minimal disaster intensity, which showed an average fiscal deficit of –2.83%. Period II (2020– 2021), of high disaster intensity, had an average fiscal deficit of –4.53%, underscoring the trend of worsening fiscal balance during years of high disaster intensity. The countries with most significant negative changes (worsening in fiscal balance) were Suriname (decline of 12.39 percentage points), Seychelles (decline of 11.83 percentage points) and Palau (decline of 11.38 percentage points).

Coefficient of variation (CV) of fiscal balance represents standard deviation from the mean fiscal balance, expressed as a percentage. A high CV indicates potential volatility in government revenue and expenditure. Our analysis shows that the CV of fiscal deficit in SIDS is approximately 2.87 times higher than that in LDCs and approximately 1.90 times higher than that in other countries. This situation for SIDS is concerning because high levels of debt can make it difficult for a country to spend money on essential services such as healthcare, education and infrastructure.

Tax revenue volatility: Tax revenue volatility refers to fluctuations and unpredictability in the collection of taxes over time. Our analysis of its correlation with disaster intensity showed a strong positive correlation of 0.61. In comparison, LDCs showed a correlation of 0.48 and other developing and developed countries showed the weakest correlation of 0.40, highlighting that disaster intensity has a lesser impact on tax revenue volatility in most developing and developed economies.

Private debt and climate impacts

Private debt often comes at a higher interest rate. Our analysis shows that in earlier years, specifically in the 2000s, the proportion of private debt accrued by SIDS

was relatively low, averaging around 6.47% of GDP. However, by the 2020s, this average rose substantially to 35.85% of GDP. Private external debt was seen to increase in the years of major disaster or in the years after that. Seychelles stands out with the highest private external debt, reaching a staggering 88.74%. Countries like Trinidad and Tobago, Papua New Guinea and the Solomon Islands have close to or more than 50% of private debt in their overall debt stock.

When examining the private external debt levels as a percentage of GDP for SIDS over two distinct high and low disaster intensity periods, a clear divergence in trends emerges. During the period of minimal disaster intensity, many SIDS displayed relatively stable or low private external debt levels. In contrast, the period marked by high disaster intensity saw a noticeable escalation in private external debt levels for several SIDS.

For the SIDS, breaking free from this vicious cycle is not just an economic imperative but a question of survival. The intertwined challenges of climate change and debt require a concerted, multifaceted response from the international community, including measures such as debt relief, concessional financing and substantial climate finance.

A way forward: building longer-term debt sustainability

Following on from our analysis of the debt trap facing SIDS, we propose measures for taking SIDS towards longer-term debt sustainability. We set out four measures and outline how each could alleviate the debt and climate risks faced by SIDS.

1. Debt alleviation

Multilayered comprehensive debt relief. When a country is hit by a climate disaster, different types of funding support are needed to help it recover from both climate and debt crises. To date, no existing debt relief measures have adequately met these needs and helped a country get its economy back on track after being hit by a disaster or series of disasters. Therefore, a layering — or combination — of debt relief options such as pause clauses, debt restructuring and reprofiling, and debt swaps would work best in restoring solvency and cover their recovery needs. To assess how layering of debt relief options might help in debt relief, we analysed two aspects: (i) impact on debt servicing and (ii) impact of reduction of total debt stock. Layering can reduce the annual debt servicing of SIDS from US$12.34 billion to US$9.49 billion. Similarly, layering can reduce the total debt stock of US$153.75 billion of SIDS (based on data of 33 SIDS) to US$81.65 billion.

Such layering can help promote sustainable recovery and promote GDP growth. Simulation of the probability of growth rate occurrence due to different debt stock reduction options shows that layering can increase the average GDP growth rate from 5.94% to 8.91%.

Complete write-off or buyout of SIDS debt stock. Recurring catastrophic climate change impacts have pushed SIDS into vicious cycles of debt; there is a need to correct historical imbalances and provide them with an opportunity to start afresh. This would require a complete write-off or buyout of all SIDS debt stocks so that they can focus on future climate resilience. It would free up resources, allowing these nations to invest in infrastructure development, longer-term climate resilience and socioeconomic betterment, ensuring their more sustainable and resilient future.

2. Future protection

The increasing frequency and intensity of climate-related events pose a continuing threat to the economies and livelihoods of SIDS. While debt relief is much needed to provide immediate fiscal breathing space after disasters, without more long-term, protective measures in place, these countries will remain precariously exposed. The ‘future protection’ concept is rooted in the idea of insulating these vulnerable nations from extreme economic fallout due to future climate impacts by limiting their economic losses through a combination of approaches. Such approaches can include insurance and other funding mechanisms that help to cover losses beyond insurable limits through a guarantee, or coverage against economic losses beyond a predetermined threshold. Our analysis shows that the cost to protect 20%, 50% and 100% loss of GDP would be US$21.34, US$53.35 and US$106.71 million, respectively. Our analysis also shows that the benefit–cost ratio (BCR) of parametric insurance to cover the losses caused by disasters at 5% Loss Exceedance Probablity (LEP) is 2.5 and 1.09 for LEP 20%.

3. Longer-term resilience investments

Resilient infrastructure, proactive adaptation through nature-based solutions and community-level resilience efforts can enable SIDS to better cope and recover form climate change. However, SIDS lack investments for these resilience measures due to the debt crisis. Raising finance though resilience bonds or green bonds with a focus on establishing robust infrastructure, such as storm-resistant housing and sea walls, or backing sustainable endeavours such as renewable energy projects, reforestation efforts or biodiversity conservation, offer transformative potential to help SIDS overcome this challenge and also build longer-term resilience. These bonds can help diversify the financing

options available to SIDS, offering an alternative to traditional loans or aid and alleviating pressure on their already-strained budgets.

4. Advisor support and legal aid

Many SIDS have limited capacity for navigating the intricate process of debt restructuring, or negotiating the terms of debt or credit rating, leaving them at a disadvantage. SIDS are also increasingly engaging with private creditors who often use debt agreements which may not be immediately clear or favourable to the nations involved. Given the huge disparity in negotiating power and expertise between SIDS and large financial entities or private creditors, there is a pressing need for a dedicated facility that can guide and support SIDS. We are proposing the creation of a 'SIDS global debt and investment platform' to help SIDS deal with these challenges. The proposed platform could provide structured support to all SIDS, such as assistance on debt contract/deal management, and provide investment deal teams, supplementing local capacity and strengthening data and technical capacity and navigating political negotiations.

The increasingly frequent and severe impacts of climate change on SIDS underscore the importance of acting now to ensure long-term debt sustainability for SIDS. The four measures we outline, combined together, provide a comprehensive approach that can help SIDS respond to current and future economic and climate shocks and forge a resilient strategy for growth and security in uncertain times.

1

What are the unique development and economic challenges facing SIDS?

Small Island Developing States (SIDS) encompass a diverse segment of the global landscape. Positioned across three major geographical regions — the Caribbean; the Pacific; and the Atlantic, Indian Ocean, Mediterranean and South China Sea (AIMS) — these islands contribute a unique value and presence within the international community.

SIDS are organised within regional groups like the Caribbean Community (CARICOM), the Pacific Islands Forum and the Indian Ocean Commission, along with smaller regional organisations. Each region has unique characteristics and challenges. While their distinctiveness adds to the world's biodiversity and cultural richness, they face a shared set of complex social, environmental and economic challenges. Recognised as a special case for development at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, SIDS gained further acknowledgement of their vulnerabilities in the outcome document of the Third International Conference on SIDS through the Small Island Developing States Accelerated Modalities of Action (SAMOA) Pathway (UN, n.d.).

The categorisation and definition of SIDS vary, with different organisations using different lists and definitions based on their focus areas (See Box 1).

Based on different categorisations used by different international organisations, SIDS comprise 20% of UN members and nearly half of the Commonwealth, and oversee 30% of the world's oceans. The 38 UN-member SIDS have a combined population of 65 million, just under 1% of the world's population. Although small in land mass, their ocean areas are vast — over 2,000 times larger than their land mass. Together, they hold 14% of the world's coastlines, and their Exclusive Economic Zone (EEZ) is 28 times larger than their land (FCDO, 2023).

1.1 SIDS are diverse

While organised into different regional groups, SIDS are incredibly diverse. They have wide-ranging differences in geography, population, economy and relationships with other nations. For instance, Pacific island states like the Solomon Islands consist of multiple islands with a small, dispersed population, and can span vast oceanic regions – more than 3.5 million kilometres in the case

BOX 1: DIFFERENT FOCUS AREAS, DEFINITIONS AND RECOGNISED LISTS OF SIDS

The United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS) focuses on addressing the unique challenges of these groups. They recognise 52 SIDS, including 38 UN members and focus on raising awareness, supporting international cooperation, and helping these countries gain access to necessary funding and resources for sustainable development.

The Alliance of Small Island States (AOSIS) is a coalition of small island and low-lying coastal countries that act collectively within the United Nations system to address their unique challenges. AOSIS includes 39 SIDS and focuses on climate change mitigation, adaptation and the sustainable development of these states, including the particular vulnerabilities that these countries face due to their geography.

The United Nations Conference on Trade and Development (UNCTAD) recognises 29 SIDS. Their definition of SIDS encompasses the economic vulnerabilities and trade-related needs of these states. They provide analysis and support on matters related to trade, investment, finance and technology to enable these countries to integrate into the world economy under favourable terms.

The World Bank Group defines small states as those with a population of 1.5 million or less, or members of their Small States Forum, which includes 50 states, 27 of which are SIDS. The World Bank Group's approach to SIDS involves addressing the economic and structural challenges they face. The focus is on creating resilience through development policies, supporting access to financial markets, improving infrastructure and fostering sustainable growth. The World Bank Group works with SIDS on various projects and offers financial products tailored to their unique needs and vulnerabilities.

These organisations, while sharing some common themes in their understanding of SIDS, approach them from different angles, emphasising different aspects of their challenges and vulnerabilities.

of Kiribati. In contrast, SIDS in Latin America and the Caribbean, such as Haiti, are closer to global markets and have larger, more concentrated populations. (OECD, 2018).

Economically, SIDS have a wide range of structures and income levels. Cabo Verde and Maldives lean heavily on services, whereas Papua New Guinea and Timor-Leste are resource rich. Yet, others, such as Kiribati and Tuvalu, depend predominantly on agriculture and fishing.

Despite being in the same region or income category, these islands experience distinct opportunities and challenges. In the Pacific, for example, there's a vast discrepancy in gross national income (GNI) per person, with figures ranging from US$1,830 in the Solomon Islands to US$13,330 in Nauru. Islands like Nauru, although possessing a relatively high GNI per capita, grapple with challenges like a staggering 90% unemployment rate (OECD, n.d.).

Other SIDS, such as Grenada and Jamaica, appear to have promising development trajectories due to their connections to international markets. However, their heavy reliance on major trading partners introduces a fragility to their economies, often coupled with high debt levels. Furthermore, some SIDS have established compacts with larger nations like Australia or the US, leading to a heightened dependency on these countries for various economic factors, from trade and tourism to financial assistance.

1.2 SIDS share unique vulnerabilities

Despite significant variations across SIDS, they grapple with a unique set of economic and developmental challenges that are common across all SIDS. These challenges stem from their inherent characteristics: limited populations and confined land areas, widespread geographical separation, and often significant distances from key global markets. For many SIDS, the majority of the natural resources they access come from the ocean. Their narrow resource base compels them to rely heavily on external markets for many goods. Many SIDS grapple with high import and export costs because of this, which also makes them susceptible to sudden global economic and political crises, and climate change impacts. For instance, many SIDS rely heavily on tourism, making them vulnerable to disruptions like the COVID-19 pandemic, which can have devastating impacts on their economies. Climate change, rising sea levels and extreme weather events also pose significant risks to SIDS due to their low elevation coastal zones and reliance on natural resources.

Traditional income-based measurements often don't capture these multifaceted vulnerabilities. Many SIDS are classified as middle- or high-income countries, resulting in ineligibility for concessional financing. For instance, 11 SIDS are considered high income, more than half are classified as middle income, and only eight nations are Least Developed Countries (LDCs) (Kalyan and Yihong, 2022). The high- and middle-income status of many SIDS greatly obscures the level of risk and vulnerability these countries face and overlooks their structural challenges. Conventional approaches may also fail to account for the particular geographic, environmental and economic sensitivities of SIDS, such as economic concentration, dependence on external flows, and vulnerability to disasters, resulting in generic international policies and support that may not adequately address their specific needs and challenges.

1.3 Vulnerability profile of SIDS: a multidimensional perspective

The particular vulnerabilities of SIDS necessitate a departure from traditional approaches and call for a more holistic assessment of their unique challenges. Recognising these limitations, we have used the Multidimensional Vulnerability Index (MVI) approach (Assa and Meddeb, 2021) to provide a more comprehensive and nuanced understanding of SIDS' vulnerabilities. The MVI assessment presented in Figure 1 (calculated for 126 countries, including 34 of the 38 SIDS) includes 11 indicators that go beyond income levels and encompass economic, environmental, geographical, financial and disaster-related dimensions.

The SIDS highest average MVI of 56.64 clearly demonstrates the challenges faced by SIDS. One of the defining features of SIDS is the structural challenges

Figure 1. Multidimensional vulnerability of SIDS compared to other countries

Source: Authors' calculation based on data from Assa and Meddeb (2021).

they face, such as remoteness; this is reflected in a score of 62.40, economic concentration at 43.58, and a significant dependence on external flows such as tourism revenues.

1.3.1 SIDS vulnerabilities in comparison with LDCs

A comparison with the LDCs reveals a striking similarity in their MVI, with SIDS at 56.64 and LDCs at 55.70. They also exhibit a similar lack of structural resilience, with SIDS at 59.00 and LDCs at 58.39, which shows their limited capacity to withstand shocks such as natural disasters or economic downturns. Enhancing resilience requires investments in infrastructure, social safety nets and building institutional capacity, but the lack of concessional finance due to their income categorisation limits the ability of SIDS to invest in these areas. A comparison of other aspects shows that SIDS are slightly more structurally vulnerable (53.42) than LDCs (52.44) and face export instability (25.88) similar to LDCs (26.37).

The MVI also reveals that all but five SIDS are far more vulnerable than their income level would suggest, and despite the similarity in their vulnerabilities, only eight SIDS are classified as LDCs. In Figure 2, we carried out an analysis of the relationship between gross domestic product (GDP) and MVI. This shows that even though the average per capita GDP of SIDS may be higher than LDCs, their vulnerabilities are comparable.

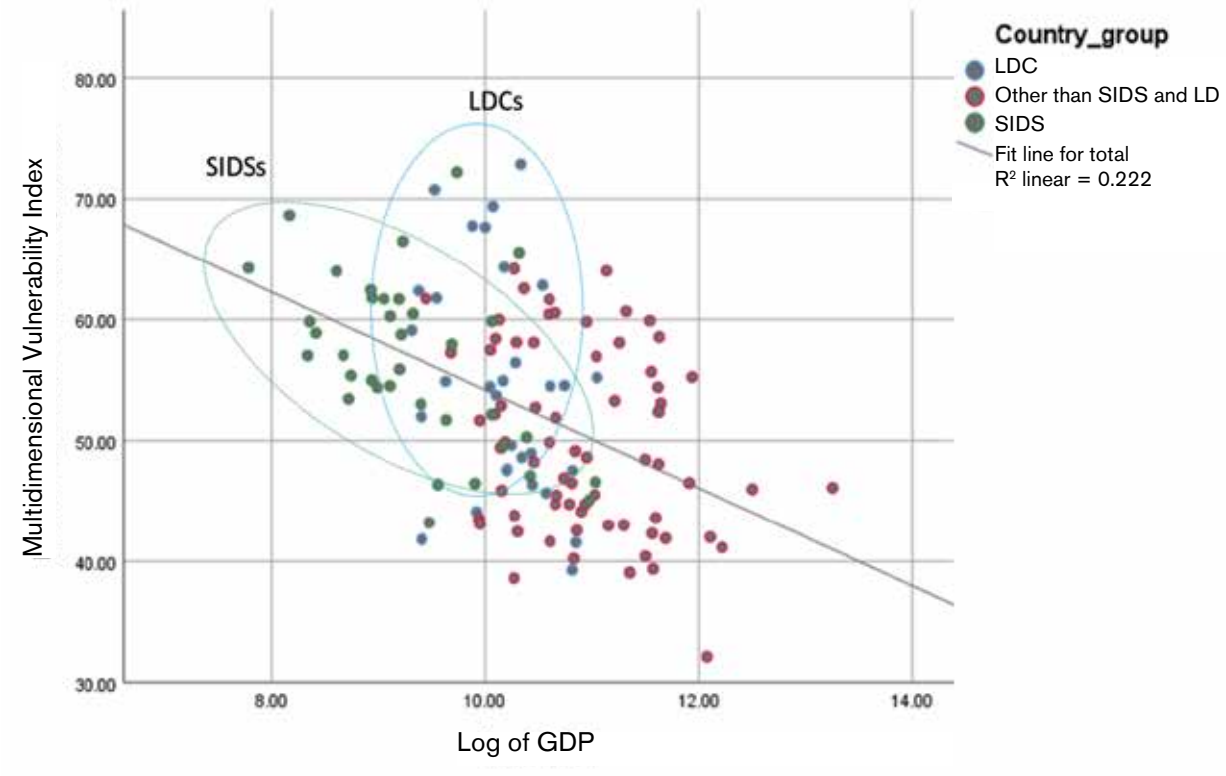
The SIDS' vulnerability profile is characterised by multiple intersecting challenges, from structural weaknesses to climate threats and economic dependencies. While sharing some similarities with LDCs, SIDS' particular geographical and economic characteristics make them even more vulnerable in specific areas highlighting the need for international support to help them build resilience.

1.3.2 Economic vulnerability

SIDS face distinct economic challenges rooted in their geographical and economic landscapes. These challenges are articulated through three core areas of vulnerability: export concentration, export instability and agricultural instability.

Export concentration. Export concentration in SIDS often manifests as an overreliance on a small number of export products, usually within sectors such as tourism, fishing or specific agricultural products. This concentrated focus can create significant vulnerability to changes in global markets, exchange rate fluctuations

Figure 2. Relationship between GDP per capita and MVI



Source: Authors' calculation based on data from database at World Bank (n.d.a) and Assa and Meddeb (2021)

or disruptions in specific sectors. For example, Fiji's reliance on sugar, accounting for 20% of its total exports in 2019, exposed it to global market dynamics and potential diseases affecting the main export crop. The dependence on tourism is also a crucial aspect of export concentration in many SIDS, as seen during the COVID-19 pandemic, which led to a 45% reduction in tourist arrivals in Fiji (Fordelone, Tortora and Xia, 2022). The remote locations of SIDS further complicate this picture, leading to high transportation and import costs that affect everything from food prices in the Marshall Islands to construction costs in Cabo Verde.

Export instability. Export instability is another defining feature of the economic landscape in SIDS. Owing to their small size and heavy reliance on a few key industries, these states are particularly susceptible to export instability. The Maldives, with its high dependency on fish exports, particularly tuna, is an example of how a downturn in global demand for key products can have a significant negative impact on the entire economy. São Tomé and Príncipe's reliance on cocoa for about 80% of its export revenue further illustrates the extreme vulnerability that stems from dependency on a single export product (Chocolate Class, 2019). This susceptibility to global market fluctuations is exacerbated by the geographical challenges of SIDS, leading to increased transportation and export costs.

Agricultural instability. Agricultural instability in SIDS often stems from a dependence on a few key crops, combined with exposure to weather events like cyclones and susceptibility to diseases. It can be challenging for SIDS to diversify the agricultural sector due to limited resources. For example, in St Vincent and the Grenadines, the banana industry suffered greatly from diseases such as Black Sigatoka, causing a marked decline in banana exports (Searchlight, 2011). Exposure to environmental challenges, such as weather events, further adds to this instability.

1.3.4 Financial vulnerability

The financial vulnerability of SIDS manifests in various ways, primarily through their heavy dependence on tourism revenues, remittances and foreign direct investment (FDI). The intricate web of dependencies exposes SIDS to global economic conditions, investor sentiment and sudden disruptions, significantly impacting domestic consumption, investment and overall economic stability.

Tourism revenues as share of exports plays a vital role in the economy of many SIDS. For countries like Palau and Maldives, tourism accounts for 58–65% of GDP, making them particularly vulnerable to global disruptions. This overdependence was evidenced during the COVID-19 pandemic when the Bahamas' tourism-dependent economy contracted by 16.3% in 2020 (OECD, n.d.). Furthermore, the reliance on tourism in many SIDS, such as Seychelles and Maldives, leads to trade deficits that are two or three times higher than the median for developing countries, enhancing their vulnerability to external shocks.

Role of remittances as percentage of GDP: remittances often form a significant portion of GDP, reflecting the countries' reliance on overseas employment. Some SIDS, such as Tonga and Haiti, are highly reliant on remittances, receiving 34.1% and 30.1% of their GDP in remittances, respectively. Any fluctuations in remittances can affect the stability of the entire economy (OECD, n.d.).

FDI inflows as percentage of GDP is a crucial aspect of financial vulnerability in SIDS. FDI serves as a significant source of funding and development, but dependence on FDI also exposes countries to global financial market fluctuations. FDI inflows can vary greatly among SIDS, ranging between 1% to more than 10% of GDP (OECD, n.d.). This reliance on FDI also makes SIDS susceptible to global investor sentiment and market dynamics, potentially leading to unpredictable shifts in investment patterns and economic stability.

1.3.5 Environmental vulnerability

Environmental vulnerability in SIDS is closely linked to their socioeconomic and ecological landscapes. This vulnerability manifests itself through two primary dimensions: the significant role of agriculture and fishing in their economies and the acute risk of natural disasters.

Agriculture and fishing as share of GDP shows that SIDS derive a substantial share of their economy from these sectors. For instance, in the Solomon Islands, fishing and agriculture contribute to around 30% of GDP (UNCTAD, 2022). These sectors play a critical role in economic sustainability, which underscores the potential risks associated with climate change and overfishing. These threats have far-reaching implications for food security and livelihoods in SIDS. The challenges do not end there: rising sea levels and saltwater intrusion into freshwater reserves threaten agriculture and drinking water supplies in countries like Maldives. This highlights the interconnected environmental challenges that these states navigate. Furthermore, the integrity of coral reefs, essential to both the ecology and economy of SIDS, is under threat from rising sea temperatures and acidity. The Seychelles has already witnessed significant coral bleaching events, with repercussions for both tourism and fishing.

Disasters: these states are highly vulnerable to natural disasters such as cyclones, tsunamis and flooding. The magnitude of this vulnerability was starkly illustrated by Cyclone Pam in 2015, which led to damages estimated at a staggering 64% of Vanuatu's GDP (UNCTAD, 2022). Extreme weather events are becoming increasingly common, and their impacts can be overwhelming. In Dominica, Tropical Storm Erika caused damages equivalent to 96% of GDP in 2015. Two years later, while the country was still recovering from Erika, Hurricane Maria caused US$1.3 billion in damages. This was equivalent to 226% of its GDP (Thomas and Theokritoff, 2021). Adding to these challenges, some islands, like Tuvalu, struggle with limited landfill space and waste management, complicating the efforts to maintain environmental sustainability.

1.3.6 Geographic vulnerability

The geographic vulnerability of SIDS is manifested through three primary aspects: remoteness, the significant share of the population living in low elevated coastal zones, and the share of the population residing in dryland areas.

Remoteness is a defining feature of many SIDS, and it brings about specific challenges in terms of competitiveness, access to goods and the diversification of the economy. The Solomon Islands, for instance, consisting of some 1,000 islands with only 90 inhabited, faces logistically and financially taxing transportation and communication hurdles. This geographic isolation is not just a logistical issue, it translates into broader economic challenges. According to the UN Liner Shipping Connectivity Index, SIDS like the Solomon Islands (which ranks 122 out of 178) are less connected to global shipping networks than other developing countries (OECD, n.d.). This lack of connectivity translates into limited shipping options and high freight costs, hampering international trade. Energy challenges add another layer of complexity. Tonga's reliance on imported fossil fuels, comprising over 10% of GDP, shows the high energy costs that many SIDS face. Simultaneously, transitions to renewable energy being pursued by some SIDS are slow and costly, further highlighting the challenges stemming from geographic isolation.

Share of the population living in low elevated coast zones emerges as another facet of geographic vulnerability in SIDS. Many of these states, such as Maldives, have significant portions of their population living near the coast, making them vulnerable to climate change threats like rising sea levels. This vulnerability threatens the entire population's homes and livelihoods, a reality that has prompted nations like Kiribati to take drastic measures, such as purchasing land in Fiji for potential relocation (UNCTAD, 2022). Climate change's economic implications further extend to industries reliant on coastal ecosystems. The significant coral bleaching events seen in Seychelles due to rising sea temperatures and acidity have affected both tourism and fishing.

Share of the population living in drylands in some SIDS adds another dimension to their geographic vulnerability. In Cabo Verde, for example, parts of the population live in dryland areas prone to drought and desertification, affecting water scarcity and agriculture. These challenges are not confined to the environment alone; they reverberate through social structures. Health facilities are often limited or distant, as seen in Palau, where severe medical cases need to be flown to other countries.

Additionally, SIDS like Antigua and Barbuda face difficulty maintaining quality education due to the high costs associated with their geographic conditions, impacting human development (OECD, n.d.).

In summary, the common economic and developmental challenges faced by SIDS arise from their small populations and landmasses, spatial dispersion, remoteness from major markets and high exposure to economic shocks. These shared difficulties significantly impede their development prospects, making them more susceptible to changes in the global environment and often leaving them with limited options to surmount these challenges.

2

How is climate compounding economic, development and debt challenges of SIDS?

2.1 Lowest emissions, highest climate impacts

Even though SIDS contribute less than 1% to global greenhouse gas emissions, they are disproportionately affected by the climate crisis. They are particularly exposed to the devastating impacts of climate change, natural disasters and extreme weather events due to their unique geographical characteristics. Many SIDS are situated in areas prone to tropical cyclones, and their remote locations and small economies hinder their ability to cope with these events. The vulnerability of those islands whose elevation is only five metres or less above sea level is heightened by the predicted rise in sea levels, posing an existential threat.

Climate change is also introducing new challenges for SIDS, such as coastal erosion, coral bleaching and degradation of natural ecosystems. These environmental shifts threaten the foundations of SIDS' economies, particularly in sectors such as food production and tourism, which rely on the health and stability of local ecosystems. These vulnerabilities are further intensified by the global crises such as COVID-19 and the war in Ukraine, which has significantly affected the economies of SIDS, making them particularly sensitive to global economic disturbances.

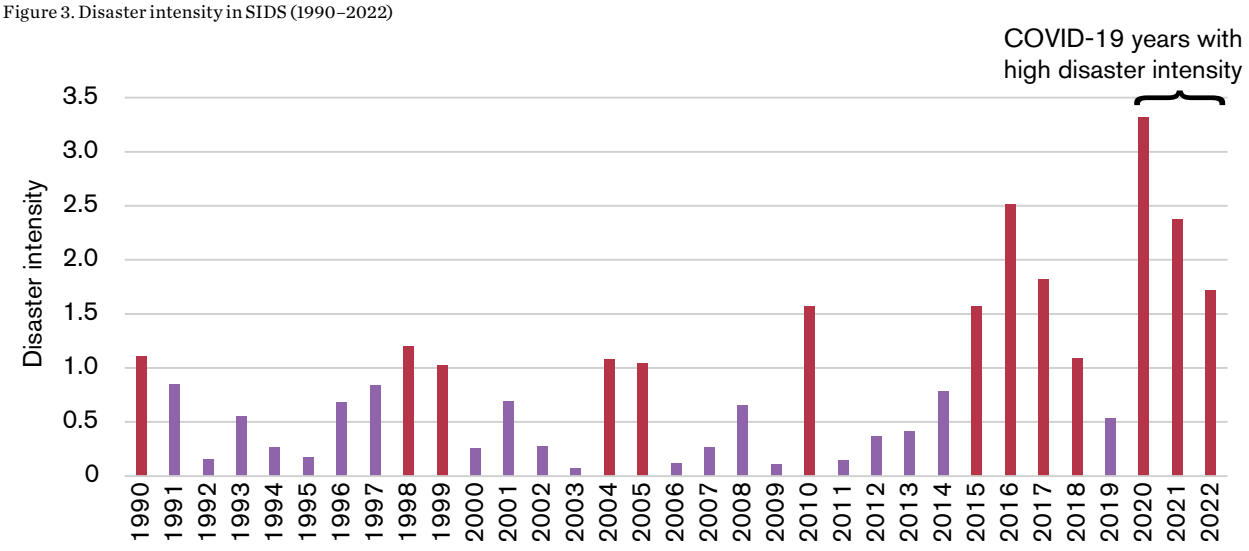
The IPCC's findings (IPCC, 2023) underscore the immediate need for climate action regarding SIDS, illustrating that these regions are not only experiencing climate change impacts but also face risks far greater than previous assessments.

2.1.1 Disaster intensity in SIDS

We carried out an analysis of change in disaster intensity and frequency in SIDS over the last three decades (see Figure 3). Our assessment shows that SIDS experienced a rising pattern of disaster intensity and frequency from 1990 to 2022.

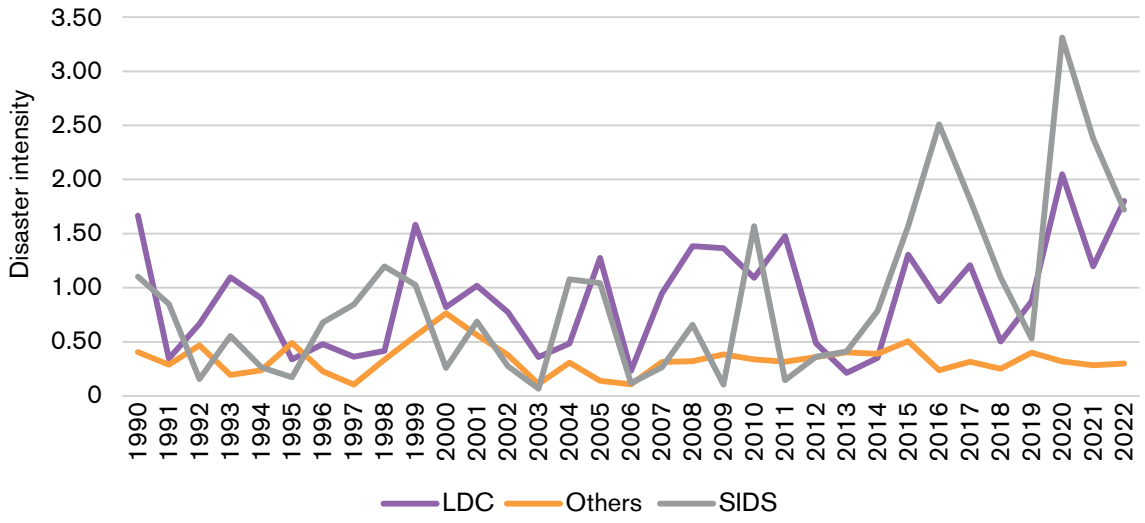
The frequency of high-intensity disasters (intensity above 1) has shown significant fluctuations, with a general upward trend observed after 2010. The number of high-intensity disasters increased from 1 in 2011 to 4 in 2012, further escalating to 11 in 2015, and settling at eight in 2022. The percentage change from year to year varied, with a 300% increase in 2012 followed by a 50% decrease in 2017 and a 133.33%

Figure 3. Disaster intensity in SIDS (1990–2022)



Note: The red bars indicate the years that experienced disaster intensity of more than one. Source: Authors' calculation based on data from EM-DAT (Centre for Research on the Epidemiology of Disasters, n.d.)

Figure 4. Disaster intensity and frequency in SIDS, LDCs and other countries (1990–2022)



Source: Authors' calculation based on EM-DAT data (Centre for Research on the Epidemiology of Disasters, n.d.)

increase in 2020. The mean disaster intensity in SIDS also exhibited variations, with notable peaks in 2015 (3.3137), 2020 (1.5689) and 2021 (2.3785). It is important to note that 2020, 2021 and 2022 were also COVID-19 years, where these high-intensity climatic disasters resulted in multi-layered crisis for many SIDS. After 2010, significant increases in mean intensity were recorded, including a 321.82% increase in 2015 and a 196.50% increase in 2020. Overall, the data for SIDS indicates a trend towards increased disaster intensity and frequency, reflecting an escalating vulnerability to high-intensity disasters.

2.1.2 Disaster intensity in SIDS compared to LDCs and other countries

Our analysis of comparison of disaster intensity of SIDS with other countries (see Figure 4) shows that LDCs also demonstrated varying trends in disaster intensity and frequency from 1990 to 2022. The frequency of high-intensity disasters showed both significant increases and decreases, with an upward trend observed after 2010. During the last 10 years (2010–2022), SIDS experienced high disaster intensity in eight (66.67%) years and LDCs experienced it in seven (58.33%) years. During 1990–2009, the frequency

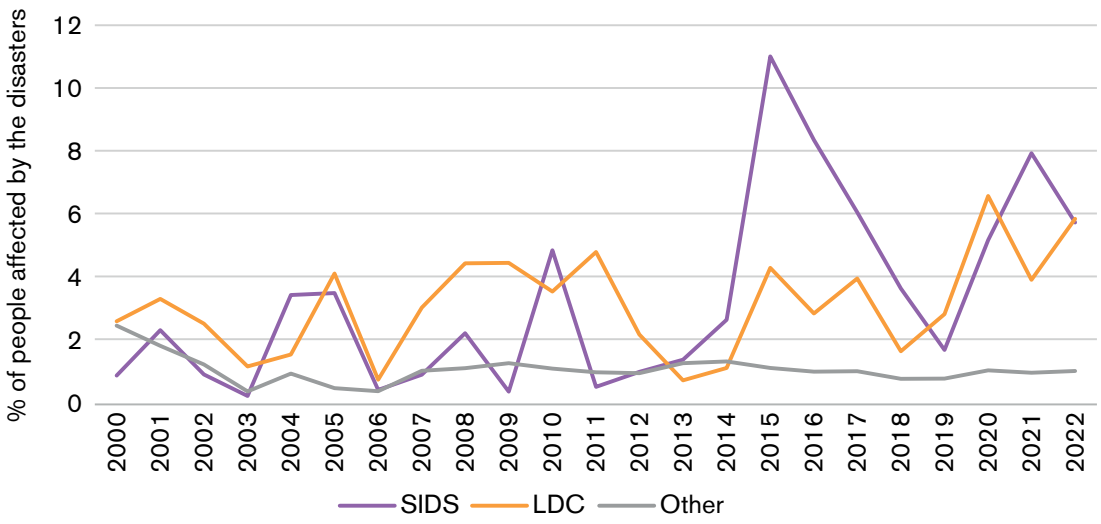
of occurrence of high disaster intensity was only 25% in SIDS and 35% in LDCs. In contrast, the average disaster intensity of other developing and developed countries is less than one in the last 32 years. The data for other countries indicates a more predictable pattern compared to SIDS and LDCs, reflecting a different landscape of disaster risks and impacts.

The variations underscore the importance of tailored preparedness, response and mitigation strategies that consider the unique challenges and vulnerabilities of different country groups.

2.1.3 Percentage of population affected

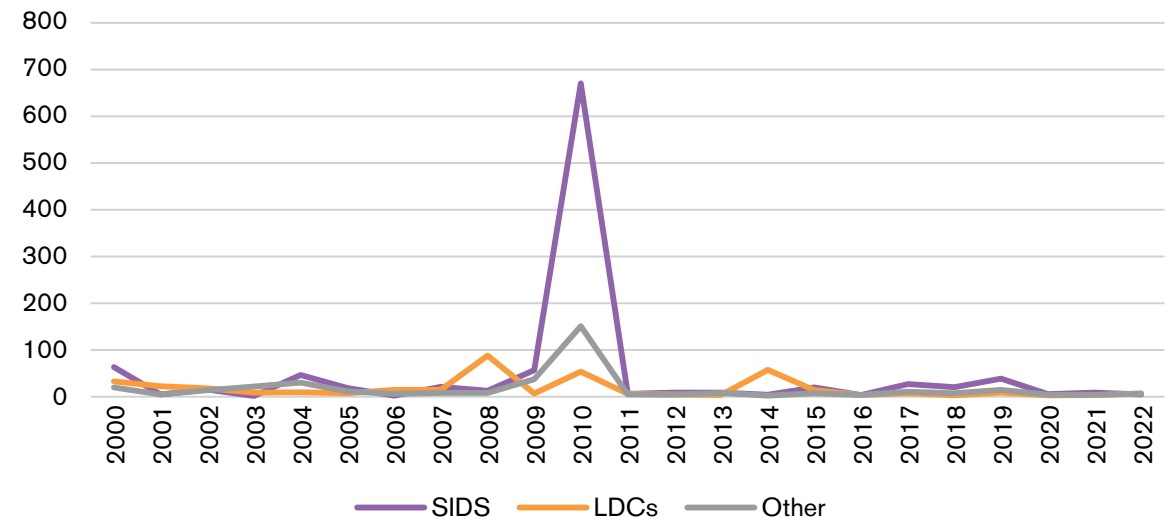
We analysed the percentage of population affected by disasters in SIDS, LDCs and other countries over the last three decades (see Figure 5). From 2011 to 2022, the percentage of the population affected by disasters in SIDS showed a noticeable increase, with the last decade witnessing a significant rise of around 120%. This rapid increase, especially pronounced in the 2020s, shows their considerable vulnerability. The years 2015 and 2016 marked significant spikes, while 2020 and 2021 demonstrated substantial increases. In contrast, LDCs saw an increase of about 40%, with occasional spikes, but without a consistent pattern, similar to SIDS.

Figure 5. Percentage of population affected by disasters in SIDS, LDCs and other countries (1990–2022)



Source: Authors' calculation based on EM-DAT data (Centre for Research on the Epidemiology of Disasters, n.d.)

Figure 6. Deaths due to disasters in SIDS, LDCs and other countries (1990–2022)



Source: Authors' calculation based on EM-DAT data (Centre for Research on the Epidemiology of Disasters, n.d.)

Other developing countries showed mixed trends, while developed countries maintained a relatively low and stable percentage of the population affected.

The deviation in these trends indicates the unique vulnerabilities faced by SIDS. The sharp increase in affected population signals immediate human costs and potential long-term challenges for these island nations.

2.1.4 Deaths per million of population

The analysis of deaths per million of population due to disasters is presented in Figure 6. The trends in deaths per million of population in SIDS fluctuated with a noticeable increase of approximately 60% in the last decade, reflecting the rising intensity of climatic events. LDCs showed a variable pattern with a general decrease, while other developing countries maintained a relatively steady trend. Developed countries observed minimal changes.

The human toll in SIDS, is evident from the increasing deaths per million of population, and its stark contrast with other regions demonstrates the critical nature of SIDS' vulnerabilities.

These patterns and implications reflect the urgency to address the increasing challenges faced by SIDS and the need to align efforts with the distinct needs of SIDS.

2.2 Scale of climate impact on economy

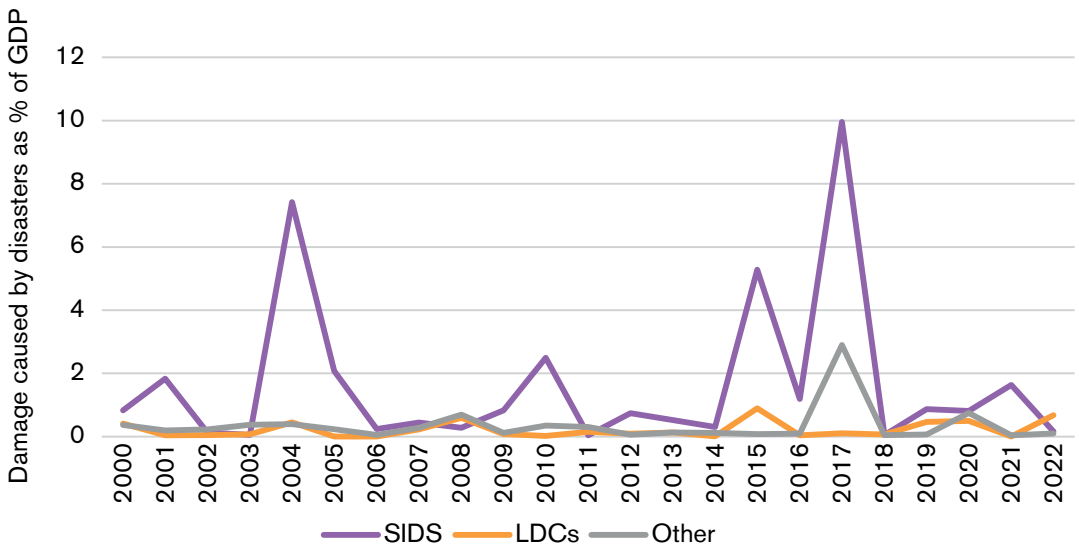
What makes SIDS particularly vulnerable is the relative impact of natural disasters on their economies. Although the absolute financial losses from disasters might seem small compared to larger countries, the relative effects on SIDS are immense. A single disaster can be catastrophic, wiping out essential industries, impacting entire islands, or destroying vital infrastructure without readily available alternatives. For example, hurricanes in 2004–2005 led to losses of 200% of GDP for Grenada. Globally, SIDS comprise two-thirds of the nations that experience the highest relative annual losses from natural disasters (1% to 9% of their GDP). Additionally, 14 out of the 20 countries with the highest average annual disaster losses relative to their GDP are SIDS.

The impact on GDP due to weather, climate and water-related events on SIDS between 1970 and 2020, was US$153 billion according to the World Meteorological Organisation — a considerable figure considering the average GDP of SIDS is US$13.7 billion (World Meteorological Organisation, 2023) .

In Figure 7, we have presented the analysis of damage caused by disasters on GDP of SIDS compared to LDCs and other developing and developed countries over the last two decades. The damage caused by disasters as a percentage of GDP in SIDS increased by nearly 90% from 2011 to 2022, with alarming levels in the 2010s. This upward trend contrasts sharply with LDCs, which experienced a modest increase of about 30%, with occasional fluctuations but without reaching the levels seen in SIDS. In other developing and developed countries, the damage as a percentage of GDP remained relatively stable or even declined.

The contrast in trends underlines the heightened financial vulnerability and unique economic risks faced by SIDS, emphasising their dependence on specific sectors like tourism and agriculture, which are susceptible to climatic changes.

Figure 7. Damage caused by disasters as % of GDP in SIDS, LDCs and other countries (1990–2022)



Source: Authors' calculation based on EM-DAT data (Centre for Research on the Epidemiology of Disasters, n.d.)

2.3 Climate and debt profile

Debt distress due to climate change introduces additional complexity to economic crisis of SIDS. Apart from suffering losses to infrastructure and GDP, after every such climatic event the costs of reconstruction and humanitarian aid are compounded in SIDS due to the need for imported materials and logistical challenges in reaching remote and widely spread populations. This exacerbates SIDS' growing debt, making them bear recurring financial burdens for post-disaster rebuilding. Moreover, adapting to climate change requires investments in protective measures, which again increases borrowings. Long-term environmental change also harms economies primarily dependent on agriculture and tourism, further increasing the debt challenges. Even global shifts tied to climate change, such as altered trade patterns or new regulations, can affect a country's ability to manage its debt.

In Figure 8 we have presented central government debt as a percentage of GDP in SIDS from 1990 to 2021, where the major disaster years are indicated as red bars.

The figure largely conforms with the trend showing that debt level increases after a major disaster, where six of the last ten years covered in the analysis have been years with major disasters. The years 2020 and 2021, apart from being high disaster years, also featured the COVID-19 pandemic, which impacted tourism-based economies of SIDS, and the Ukraine war, which has raised fuel and food grain prices, compounding the debt challenge for SIDS.

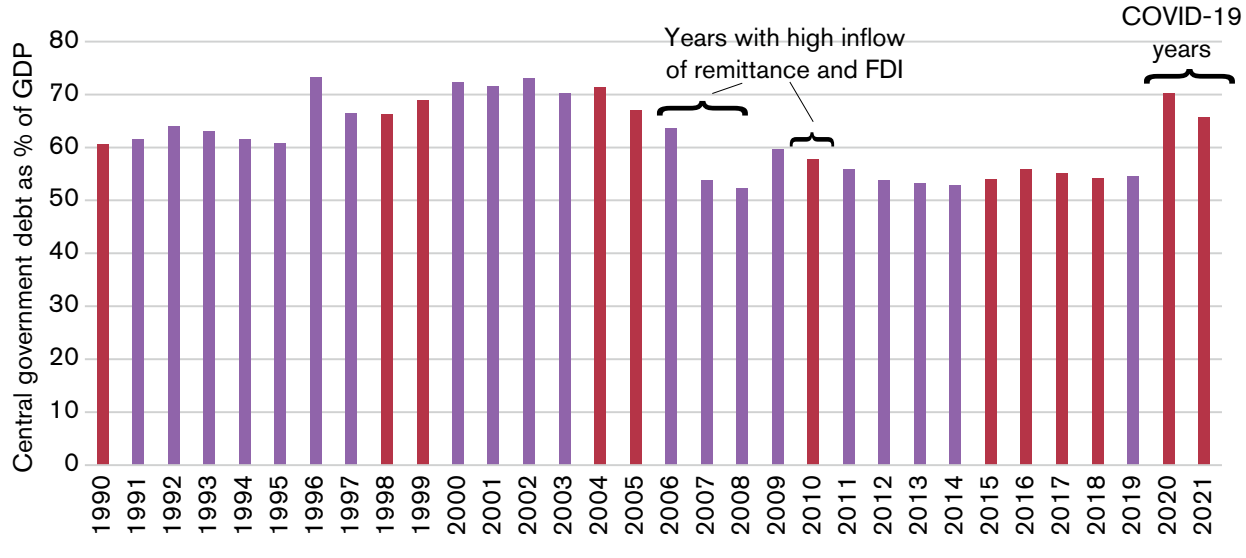
But this trend also needs to be understood from the viewpoint of the unique vulnerabilities of SIDS, particularly remittances and FDI, and how other factors impact the way debt crisis pans out in different countries.

As mentioned in Chapter 1, remittances form a significant portion of GDP in SIDS, with close to 30% of GDP being contributed by remittances in some countries. Any fluctuations in remittances can affect the stability of the entire economy. Similarly, FDI inflows as a percentage of GDP is a crucial aspect of financial vulnerability in SIDS. FDI serves as a significant source of funding and development, but dependence on FDI also exposes these countries to global financial market fluctuations.

Remittance flows to the 35 official development assistance (ODA)-eligible SIDS (OECD, 2022) have shown substantial variation over the years, with figures moving from US$10 billion in 2005 to a peak of US$27 billion in 2010, and then down to US$10 billion by 2014. Particularly notable were the fluctuations between 2007 and 2011. The increase from US$15 billion in 2006 to US$24 billion in 2007 marked a significant 60% rise, followed by a sharp decline of 33% to US$16 billion in 2008. The remittances then slightly increased to US$17 billion in 2009, representing a 6% increase, before surging by 59% to US$27 billion in 2010. A substantial drop of 41% occurred in 2011, bringing the figure down to US$16 billion.

These fluctuations in remittance flows had a profound impact on the economies of SIDS. Increased remittances likely supported improvements in foreign exchange positions, consumption and investment, reducing the need for external borrowing: we can see in Figure 8 that, despite major disasters in 2004, 2005 and 2010, debt levels did not increase in the following years. The significant influx of remittances

Figure 8. Disaster events and central government debt as % of GDP in SIDS (1990–2021)



Note: The red bars indicate the occurence of major disasters in the year. Source: Authors' calculation based on data from IMF (n.d.a) and EM-DAT (Centre for Research on the Epidemiology of Disasters, n.d.)

in 2006 and 2007 and the substantial amount in 2008 likely contributed to increased foreign exchange reserves, improved balance of payments and better macroeconomic positions. This, in turn, may have enabled governments to reduce their reliance on external borrowing, thus contributing to a reduction in debt levels during these years. However, the global financial crisis and the modest increase in remittances in 2009 might have necessitated increased borrowing to support economic stability, leading to higher debt levels that year. The substantial inflow of remittances in 2010 likely provided a strong buffer, enabling SIDS to strengthen their fiscal positions and reduce debt.

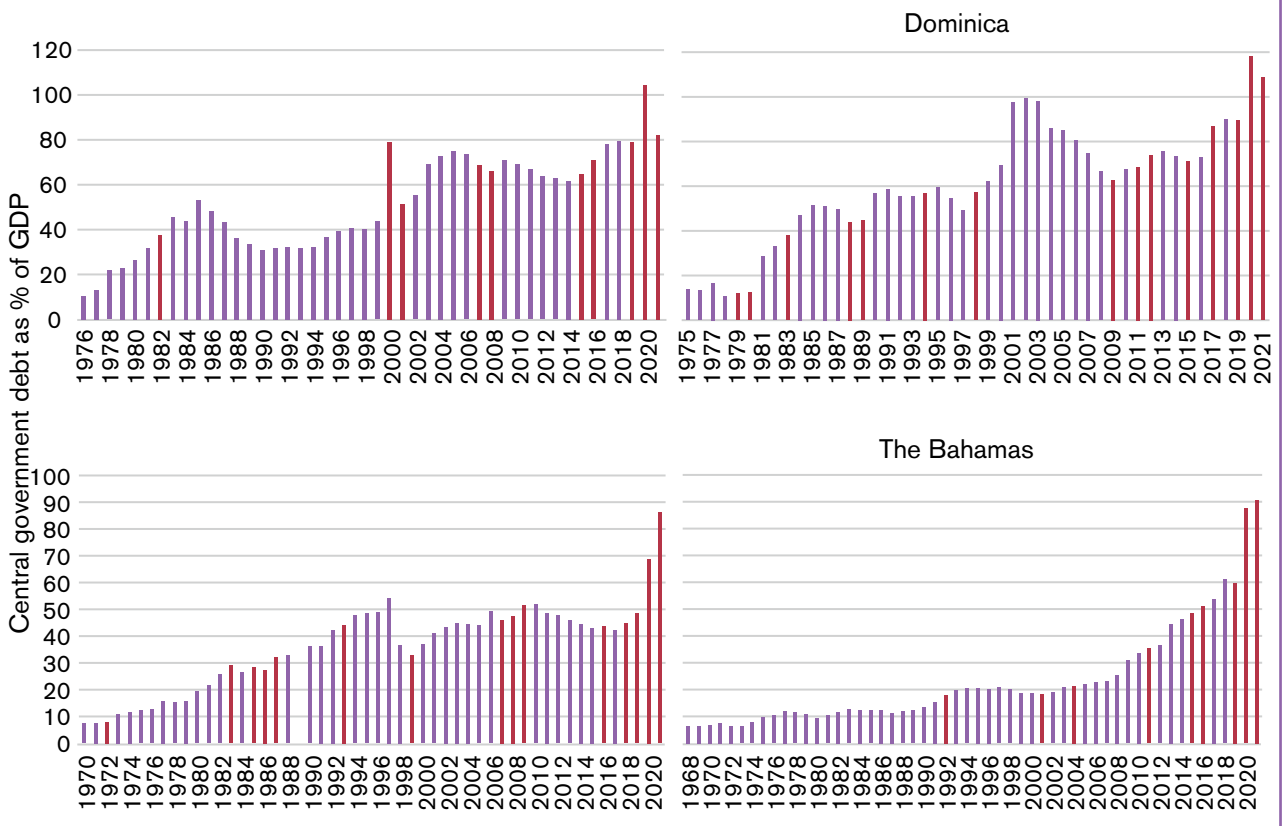
But this trend is not the same across all countries. We have presented the impact of disaster events and sovereign debts for select SIDS countries (1990–2021) in Figure 9. In the case of Dominica, we can see the impact of higher remittance flow in helping manage the debt crisis after the disaster event in 2004, however in other countries, such as the Bahamas, Fiji and Belize, increased debt levels can be seen following disaster events.

The fluctuations also illustrate the complex interdependence of various economic factors in SIDS. The relationship between remittances and debt levels underscores both the importance of remittances as a lifeline and a source of vulnerability. While addressing the debt crisis, careful consideration to this dynamic is needed to manage debt and foster sustainable economic growth, recognising the essential role that remittances play in both supporting and challenging economic stability.

2.4 Impact of climate disasters on the debt sustainability of SIDS

The International Monetary Fund (IMF) conducts debt sustainability analysis (see Box 2) as a vital framework to assess a country's ability to meet its current and future debt obligations without needing drastic measures such as debt relief or significant balance of payments adjustments. The analysis assesses key indicators, including **the debt-to-GDP ratio**, **fiscal deficit**, **external debt** and **tax revenue volatility**. The latter refers to unpredictable fluctuations in tax revenues which can impact a government's ability to plan and budget effectively and may lead to unforeseen challenges in managing debt. The IMF also focuses on future economic and fiscal scenarios, taking into account potential shocks, stress tests and the volatility of tax revenues.

Figure 9. Disaster events and sovereign debts for select SIDS countries (1990–2021)



Note: The red bars indicate the occurence of major disasters in the year. Source: Authors' calculation based on data from IMF (n.d.a) and EM- DAT (Centre for Research on the Epidemiology of Disasters, n.d.)

BOX 2. WHAT IS DEBT SUSTAINABILITY ANALYSIS?

Debt Sustainability Analysis (DSA) serves as a financial health check for a country, examining how much money a country owes and determining if it can pay back that money without falling into financial stress.

The process of DSA begins by examining the total debt, including what is owed to other countries and the applicable interest rates. It then involves predicting the country's economic growth, interest rate fluctuations, and government revenue from taxes. Stress testing or imagining potential adverse scenarios, such as sudden spikes in interest rates or drops in economic growth, helps to assess how the debt might react. Based on all this information, analysts decide if the debt levels are safe or risky. When too much debt can lead to a financial crisis, DSA can also act as a tool to provide early warnings.

By integrating economic understanding of debt with the impacts of climate change there is an opportunity to develop strategies that can help countries like SIDS in dealing with more intense and frequent disasters due to climate change and transition to a more resilient and sustainable future.

Indicators like the debt-to-GDP ratio, fiscal deficit, external debt and tax revenue volatility are thus critical indicators for understanding the complex interplay between debt sustainability and climate change in SIDS. We have analysed these indicators for 33 SIDS for which most recent debt data was available.

2.4.1 Debt-to-GDP ratio

The debt-to-GDP ratio is a key measure of a country's ability to service its debt. In SIDS, climate change can directly affect this ratio by causing damage that requires increased borrowing (raising the debt), while simultaneously impacting economic sectors like tourism or agriculture (reducing GDP). A high debt-to-GDP ratio can signal a risk of debt crisis, particularly in SIDS, where climate change effects can be sudden and severe. In Figure 10, we have presented a categorisation of SIDS based on central government debt as percentage of GDP.

As shown in Figure 10, the 60% debt-to-GDP ratio has been a commonly referenced threshold in economic analyses, including those related to debt sustainability. For advanced economies, the 60% debt-to-GDP ratio has often been used as a reference point, based on the Maastricht Treaty[1] criteria for European Union member states. While this specific threshold might not be a rigid rule for all countries, it serves as a benchmark for assessing debt sustainability. However, for SIDS, this threshold might not apply, as their specific vulnerabilities can require more tailored analysis. A lower threshold might be more appropriate for SIDS, due to their unique characteristics and increased susceptibility to shocks. IMF analyses have considered a ratio of 40% or 30% of GDP[2] as a warning sign, given these states' limited economic diversification and greater exposure to external shocks.

In our analysis, we have categorised countries (a total of 33 countries for which data was available) into four groups based on their debt levels relative to their GDP.

1. **Countries pushing towards debt distress:** Countries with a debt-to-GDP ratio exceeding 100% fall into this category. Six countries are classified here: Dominica, Cabo Verde, Barbados, Suriname, Maldives, and Antigua and Barbuda.
2. **Highly indebted:** Countries with a debt-to-GDP ratio greater than 80% but less than 100% have been classified as highly indebted. Eight countries are in this category, including Mauritius and Saint Lucia, both of which have a ratio exceeding 90%.
3. **Moderately indebted:** Countries that have a debt-to-GDP ratio ranging from 40% to 80% are classified as moderately indebted. There are nine countries in this group.
4. **Less indebted:** The final category consists of countries with a debt-to-GDP ratio below 40%. Ten countries are placed in this category.

According to our analysis, more than 40% of SIDS are either highly indebted or are pushing towards debt distress, and overall, 70% countries are above the debt sustainability threshold of 40% of GDP as debt. Even if we consider 60% debt-to-GDP ratio as the debt sustainability threshold, close to 60% of countries are above it, an alarming situation for SIDS.

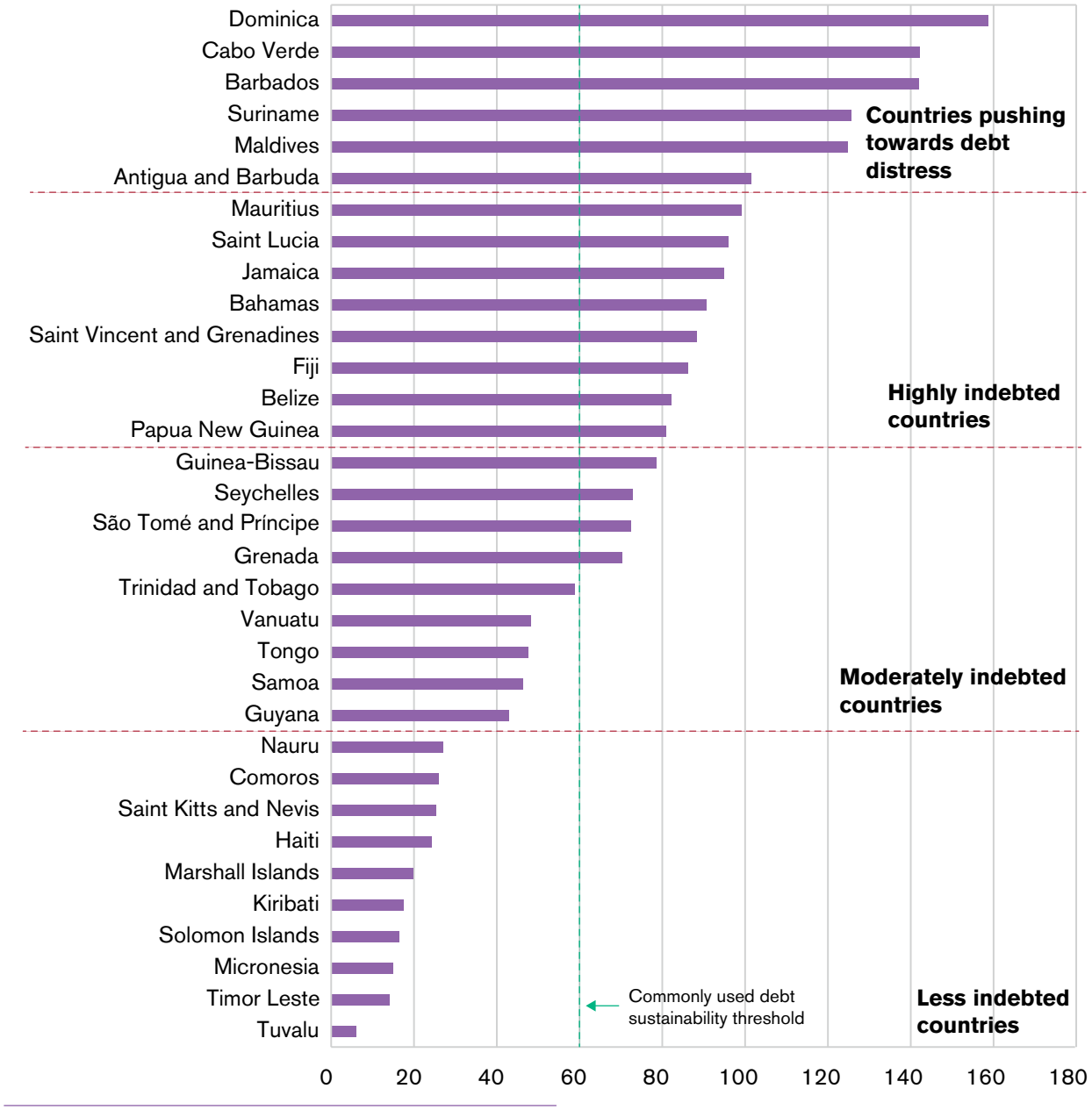
2.4.2 External debt

SIDS often rely on external borrowing to finance development and respond to shocks. Climate change increases the need for such borrowing, both for immediate recovery efforts and long-term adaptation. However, fluctuations in global economic conditions

[1] The 60% debt-to-GDP ratio threshold has its roots in the Maastricht Treaty criteria, which were established as convergence criteria for countries joining the European Monetary Union. According to the Treaty, the ratio of gross government debt to GDP must not exceed 60% at the end of the preceding fiscal year. It is important to note that while this criterion was initially applied to European countries, the 60% threshold has often been cited more broadly in economic literature and policy discussions.

[2] IMF applies different thresholds of debt sustainability. For instance, for Kiribati, the external debt burden threshold is 30%, while for Vanuatu, the external debt burden threshold is 40%.

Figure 10. Classification of SIDS based on central government debt as percentage of GDP



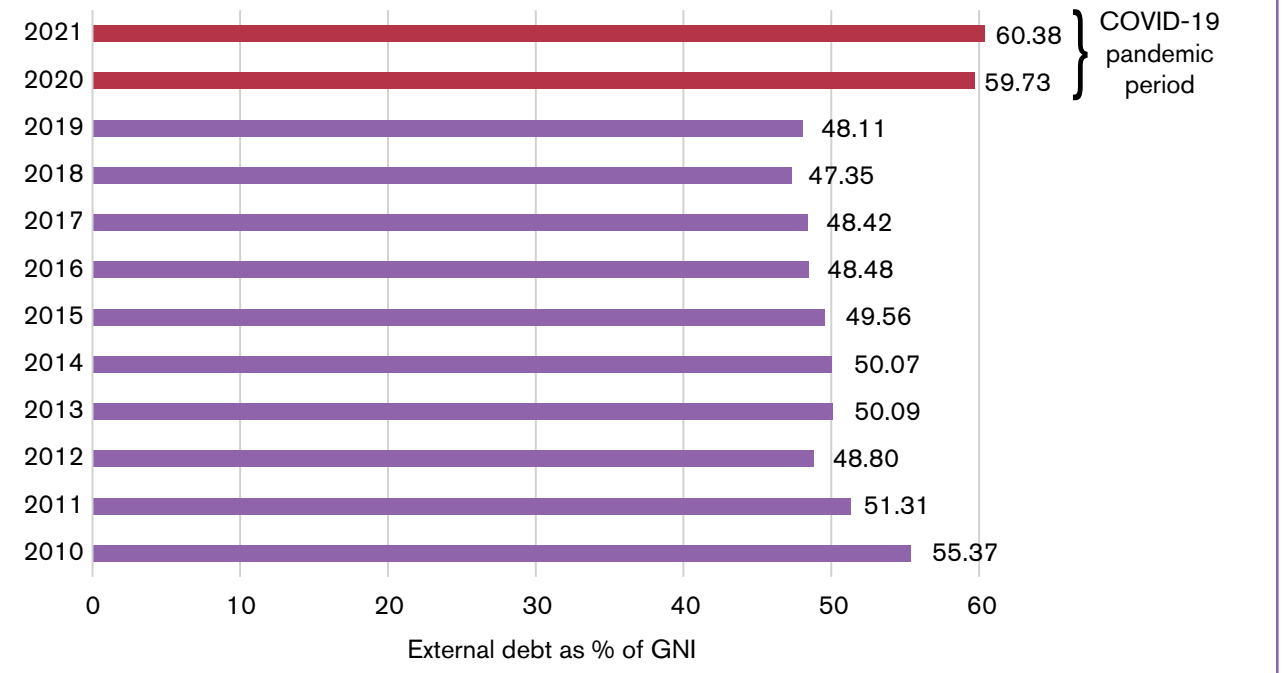
Source: Authors' calculation based on data from (World Bank, n.d.b)

influenced by climate change can affect interest rates and borrowing terms. For SIDS, where external debt may already be significant, these changes can threaten debt sustainability, necessitating careful management and negotiation of external borrowing.

In Figure 11, we have presented the analysis of external debt vulnerability in SIDS. From 2011 to 2019, SIDS' external debt fluctuated between 48% and 51% of GNI, revealing a consistent reliance on external sources of financing. The consistent proximity to the 50% threshold also highlights a precarious fiscal position that can be easily tipped into distress by external shocks or changes in global economic conditions, such as climate events, commodity price fluctuations, and shifts in global trade and finance. During such crisis, countries might have to undertake necessitated emergency spending, when they may already be facing strained economic conditions due to disruption in trade and tourism — key sectors for many SIDS. The resulting increase in borrowing from external sources may further expose these nations to the risks of debt distress and the challenges of sustainable debt management.

The years 2020 and 2021 have brought these vulnerabilities into sharp focus, with the advent of the COVID-19 pandemic exacerbating the debt crisis in SIDS. The sudden spike in external debt to 59.73% in 2020 and 60.38% in 2021 underscores the reliance on external creditors to manage the economic fluctuations wrought by the pandemic.

Figure 11. External debt of SIDS as % of GNI from 2011–2021



Source: Authors' calculation based on data from World Bank (n.d.b)

Comparing external debt as % of GDP in SIDS: period of minimal disaster intensity versus period of high disaster intensity. To further understand the impact of climate disasters on the SIDS' external debt, we examined the correlation between disaster intensity and external debt levels as a percentage of GDP in SIDS. We did this by comparing two distinct periods: Period I (2007–2009), a period of minimal disaster intensity and Period II (2020–2021), a period of high disaster intensity, including the impact of the COVID-19 pandemic — the analysis reveals a pronounced trend of increasing debt associated with greater disaster intensity (see Figure 12).

- **Period I: minimal disaster intensity (2007–2009).** During Period I, the mean external debt for SIDS stood at 45.37%, reflected varying levels of debt across these nations. This period was marked by lower intensity of disasters and relatively stable economic conditions in some countries.
- **Period II: high disaster intensity (2020–2021).** Contrastingly, Period II, which was marked by increased disaster intensity and additional pressures from the COVID-19 pandemic, saw a rise in the mean external debt to 58.50%.

The analysis between the two periods unearthed several key trends and observations. Nearly 70% of the countries experienced an increase in external debt, with some witnessing remarkable surges. For example, the Bahamas saw a 720.83% increase in debt, moving from 5.74% to 47.11%. Papua New Guinea also experienced a substantial rise of 379.03%, from 14.52% to 69.57%.

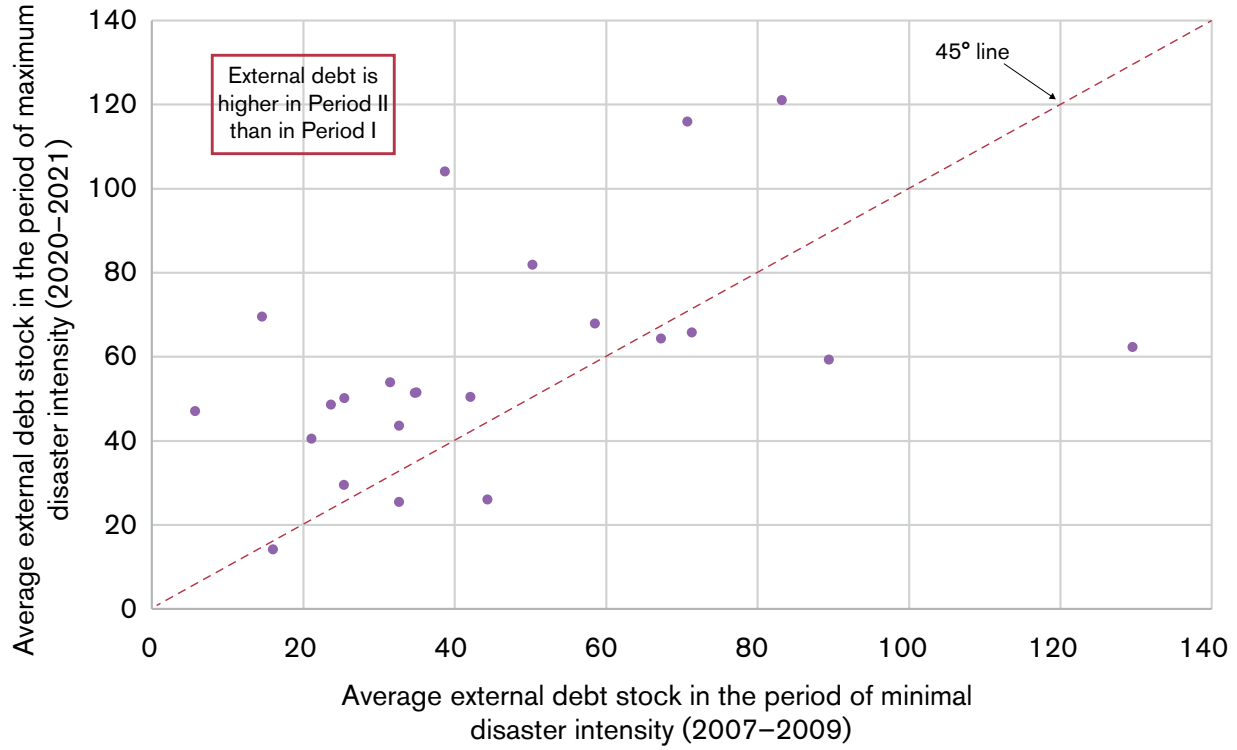
The higher overall debt in the period of high disaster intensity compared to the period of minimal disaster intensity underscores a clear relationship between climatic disasters and external debt. The mean and median values for Period II being higher than those for Period I is indicative of a general trend of increased debt associated with greater disaster intensity. The COVID-19 pandemic's dual impact on health and economic systems has further strained resources, increasing borrowing needs and compounding the debt challenges.

2.4.3 Fiscal deficit

The fiscal balance of a country plays a pivotal role in determining its financial health. The fiscal balance can manifest either as a surplus, when revenue exceeds expenditure, or as a deficit, when the opposite occurs. A fiscal deficit is akin to a situation where an individual spends more money than they earn in a given period, leading to a shortfall. When a government spends more than it receives in revenue, it faces a fiscal deficit. This deficit is often covered by borrowing money, leading to sovereign debt.

Climate change-related events like hurricanes or droughts can lead to unexpected expenditures for recovery and humanitarian assistance, widening the fiscal deficit. Simultaneously, these events may reduce tax revenues due to the loss of income in affected sectors. In SIDS, where fiscal buffers may be limited, a widening fiscal deficit can quickly lead to debt crisis.

Figure 12. Comparing external debt as % of GDP in SIDS: period of minimal disaster intensity (2007–2009) versus period of high disaster intensity (2020–2021)



Source: Authors' calculation based on data from (Kose et al., 2022) and EM-DAT data (Centre for Research on the Epidemiology of Disasters, n.d.)

Comparing fiscal balance as a percentage of GDP in SIDS: period of minimal disaster intensity versus period of high disaster intensity. We carried out the analysis of fiscal balance as a percentage of GDP in SIDS during two specific periods (see Figure 13).

The first period, from 2007 to 2009, representing years of minimal disaster intensity, had an average fiscal deficit of –2.83%. The second period, encompassing the years 2020 and 2021, representing the time of high disaster intensity, including the COVID-19 pandemic, had an average fiscal deficit of –4.53%. The increase in the fiscal deficit during the period of high disaster intensity underscores a trend of worsening fiscal balance. This trend is not uniform across all countries. The most significant negative changes (worsening in fiscal balance) were in:

1. Suriname: decline of 12.39 percentage points

2. Seychelles: decline of 11.83 percentage points

3. Palau: decline of 11.38 percentage points.

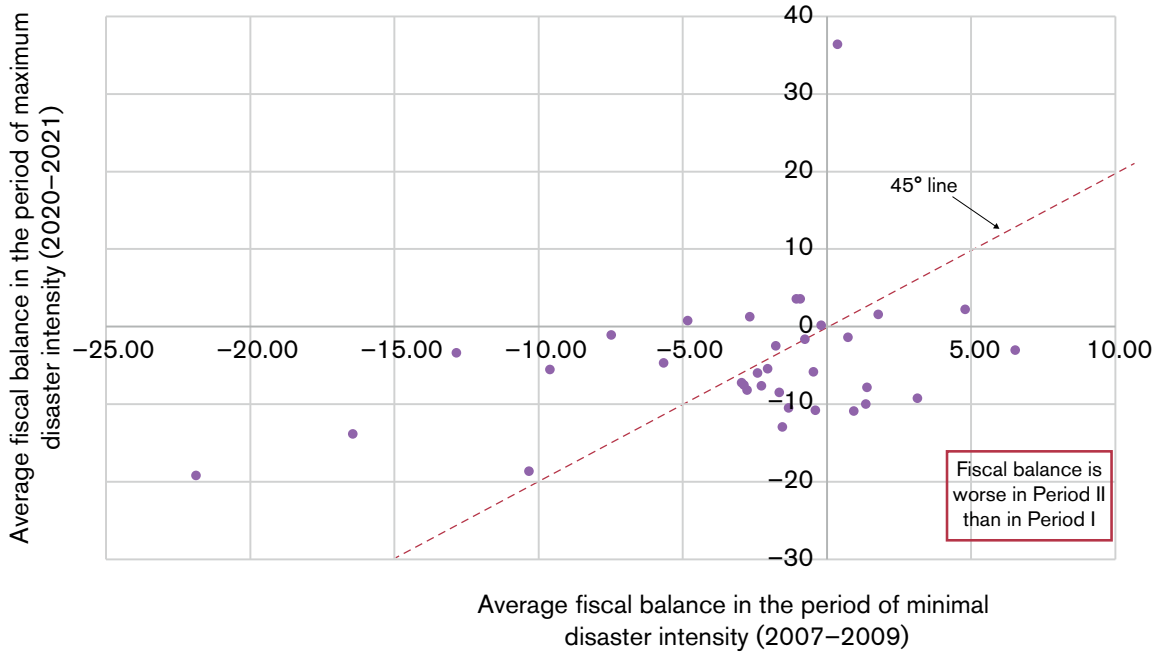
The fiscal balance, particularly the deficit, is a barometer of financial stability and an indicator of potential challenges. The analysis of fiscal balance in SIDS during periods of varying disaster intensity provides valuable insights into how crises can shape fiscal policy, drive borrowing, and influence debt dynamics.

Coefficient of variation of fiscal balance. The coefficient of variation (CV) is a statistical measure that describes the relative variability of a data set in relation to its mean. In the context of fiscal balance, the CV represents the ratio of the standard deviation to the mean fiscal balance, expressed as a percentage. The CV of fiscal balance provides insights into the stability and sustainability of a country's fiscal policy. A high CV indicates significant fluctuations in fiscal balance, reflecting potential volatility in government revenue and expenditure. This can have profound implications for economic planning, debt management and overall economic stability. We analysed the CV of fiscal balance of SIDS in comparison to LDCs and other developing and developed countries based of the data for the period 1990–2021 (see Figure 14).

Our analysis shows that the CV of fiscal deficit in SIDS is approximately 2.87 times higher than that in LDCs and approximately 1.90 times higher than that in other countries. These ratios emphasise the significantly greater variability and negative trend in fiscal balance for SIDS compared to both LDCs and other countries, highlighting the unique challenges and vulnerabilities they face.

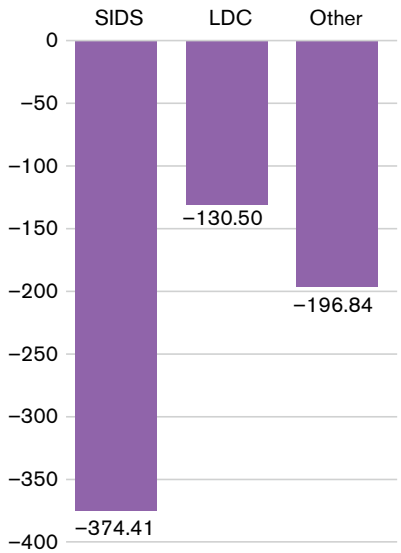
The situation for SIDS is concerning because high levels of debt can make it difficult for a country to spend money on essential services like healthcare, education and infrastructure. If too much money goes towards paying off debt, there may be less available for these crucial areas. This can slow down economic growth and make it harder for the country to develop in the long run.

Figure 13. Comparing fiscal balance as % of GDP in SIDS: period of minimal disaster intensity (2007-09) versus period of high disaster intensity (2020–2021)



Source: Authors' calculation based on from data from (Kose et al., 2022) and EM-DAT data (Centre for Research on the Epidemiology of Disasters, n.d.)

Figure 14. Coefficient of variation of fiscal balance during 1990–2021 (%)



Source: Authors' calculation based on data from (Kose et al., 2022)

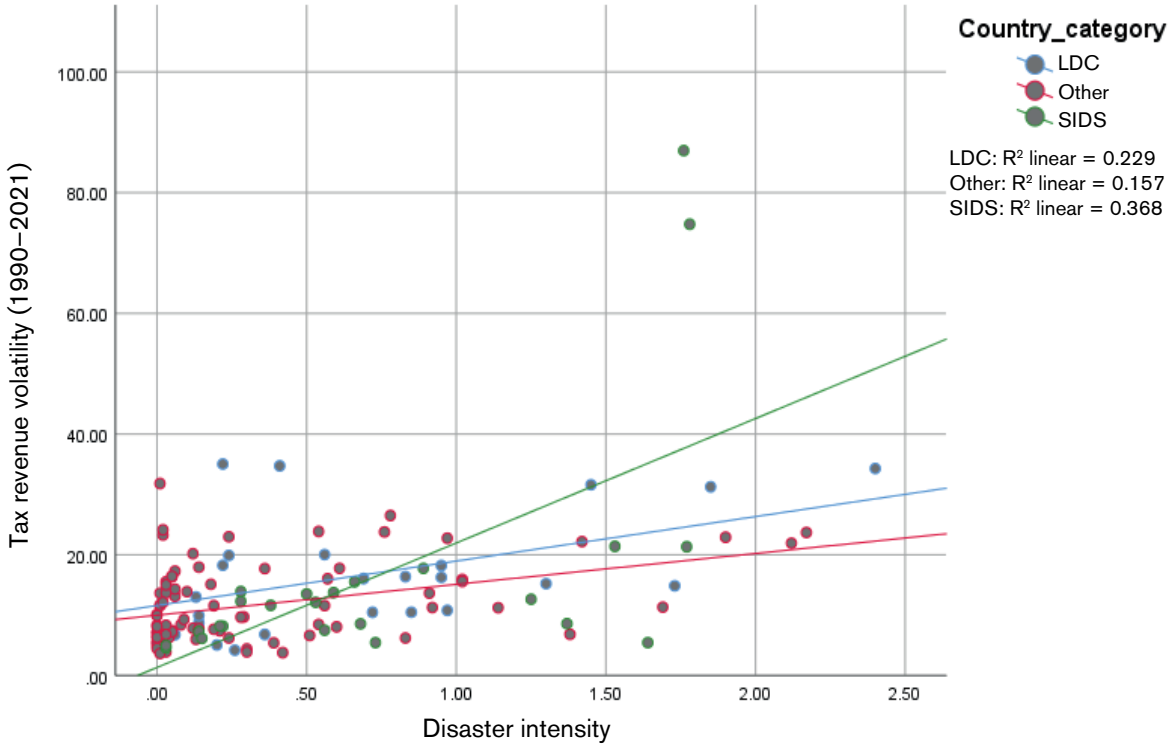
2.4.4 Tax revenue volatility

Tax revenue volatility refers to the fluctuations and unpredictability in the collection of taxes over time. It represents the degree of variability in tax revenue, which may occur due to changes in economic conditions, tax policies, natural disasters or other factors.

Many SIDS depend on specific sectors like tourism, which are highly sensitive to climate change. Extreme weather events can lead to substantial fluctuations in income from these sectors, causing tax revenue volatility. This unpredictability complicates budget planning and can exacerbate fiscal deficits, particularly in SIDS where alternative revenue sources may be limited. Volatility in tax revenue can also hinder the government's ability to commit to long-term investments in infrastructure, education, healthcare and other areas crucial for growth and development. Unstable revenue may lead to cuts in public spending or delayed projects, hindering economic progress. Understanding and managing this volatility is vital for maintaining fiscal stability and avoiding a debt crisis.

We undertook the analysis of the relationship between tax revenue volatility and disaster intensity for SIDS compared to LDCs and other developing and developed countries (see Figure 15).

Figure 15. Relationship between tax revenue volatility and disaster intensity



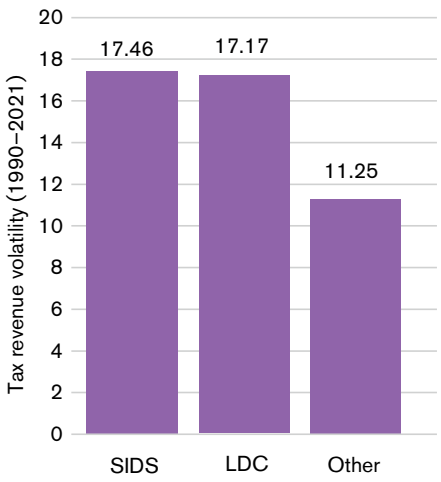
Source: Authors' calculation based on data from (Kose et al., 2022) and EM-DAT data (Centre for Research on the Epidemiology of Disasters, n.d.)

The analysis presented the following trend:

- **SIDS:** A strong positive correlation of 0.61 indicates that increased disaster intensity is associated with higher tax revenue volatility. Climate change, leading to more frequent and intense natural disasters, may be a significant driver of this volatility in SIDS.
- **LDCs:** A positive correlation of 0.48 suggests a similar but slightly weaker relationship between disaster intensity and tax revenue volatility.
- **Other developing and developed countries** show the weakest correlation of 0.40, highlighting that disaster intensity has a lesser impact on tax revenue volatility in most developing and developed economies.

Tax revenue volatility (presented in Figure 16) in SIDS compared to LDCs and other developing and developed countries shows that SIDS exhibit a higher average tax revenue volatility of 17.46 for the period 1990–2021. LDCs have a slightly lower but comparable volatility to SIDS, at 17.17. Other developing and developed countries show a significantly lower tax revenue volatility, with an average of 11.25.

Figure 16. Tax revenue volatility (1990–2021)



Note: Tax revenue volatility is represented by coefficient of variation of tax revenue of the countries for 1990–2021. Source: Authors' calculation based on data from Kose et al. (2022)

2.5 Private debt and climate impacts

Sovereign debt can be broadly categorised into two types: debt borrowed from private sector creditors (such as commercial banks, investment funds or bondholders) and debt borrowed from official or public creditors (such as other governments, international organisations or development banks). For SIDS, there can be differences in the interest rates and borrowing terms associated with these two categories of debt.

Generally, private creditors may demand higher interest rates compared to official lenders. This is because private creditors often prioritise profit and may perceive higher

risks associated with lending to SIDS. Factors such as climate vulnerability, limited market access and economic vulnerabilities are perceived as potential credit risks and contribute to higher interest rates. Conversely, countries with stronger macroeconomic fundamentals and better credit rating are able to negotiate lower interest rates, even with private creditors.

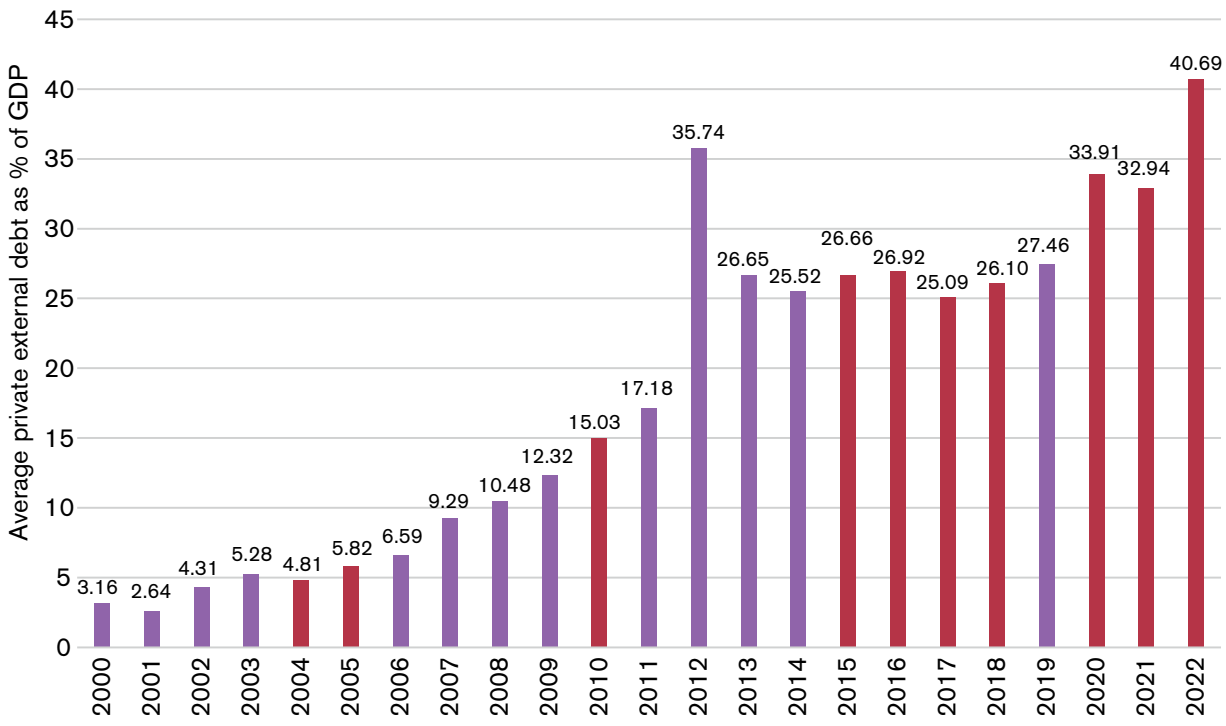
Official creditors, such as multilateral development banks or bilateral government lenders, offer more concessional terms, including lower interest rates. However, the concessional financing to SIDS remains low. Concessional flows — ODA — directed to SIDS in 2019 were US$5,742 million (UN-OHRLLS, n.d.). SIDS receive very little support as a share of total ODA (UN-OHRLLS, n.d.). Multilateral institutions like the World Bank and the Asian Development Bank (ADB) also offer concessional finance. These loans or grants come with even more favourable terms, including low or zero interest rates, extended grace periods and long repayment terms. But several SIDS who have graduated to middle-income status (determined by per capita income classifications) have lost access to concessional finance from multilateral development banks due to the eligibility requirements for access to concessional resources.

An assessment (Buhr et al., 2018) for Climate Vulnerable Forum members[3] shows that for every US$10 paid in interest by developing countries, an additional dollar will be spent due to climate vulnerability. This has also added more than US$40 billion to the debt interest paid by the 40 most vulnerable nations between 2007 and 2016. Higher interest rates based on climate vulnerability are predicted to cost the most vulnerable countries US$168 billion over the next decade. One study (Mohaddes et al., 2021) shows that 63 sovereigns may see their credit ratings downgraded by 2030 due to climate change. This could add more than US$200 billion to their annual interest payments on public debt.

In Figure 17, we have analysed the private external debt as a percentage of GDP in SIDS (n-18) for the period from 2000 to 2022, alongside high disaster years. In the earlier years, specifically in the 2000s, the debt was relatively low, averaging around 6.47% of GDP. However, by the 2020s, this average rose substantially to 35.85% of GDP. The private external debt was seen to increase in the years of major disaster or in the years after that. The upward trajectory of private sector debt as percentage of GDP indicates growing economic challenges and the implications for SIDS economies.

An increasing proportion of global South debt is owed to private creditors, and almost half of external debt and interest payments by low- and lower-middle-income countries is to private lenders (Jones, 2022). The situation

Figure 17. Private external debt as % of GDP and disaster event years



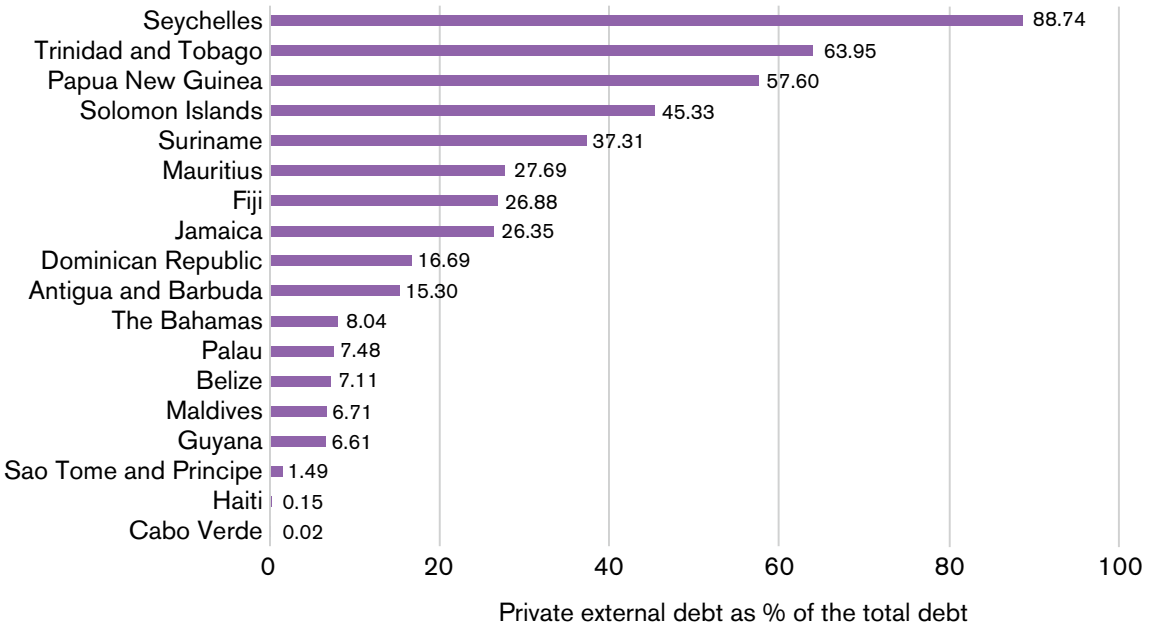
Note: The red bars indicate the years that experienced disaster intensity of more than one. Source: Authors' calculation based on data from Kose et al. (2022)

[3] The Climate Vulnerable Forum is an international partnership of countries highly vulnerable to a warming planet. The Forum serves as a South-South platform for participating governments to act together on global climate change. https://thecvf.org/

is similar in the case of many SIDS, where private sector debt forms a substantial portion of total external debt (see Figure 18). Seychelles stands out with the highest private external debt, amassing a staggering 88.74%. Countries like Trinidad and Tobago, Papua New Guinea and the Solomon Islands have close to or more than 50% share of private debt in their overall debt stock.

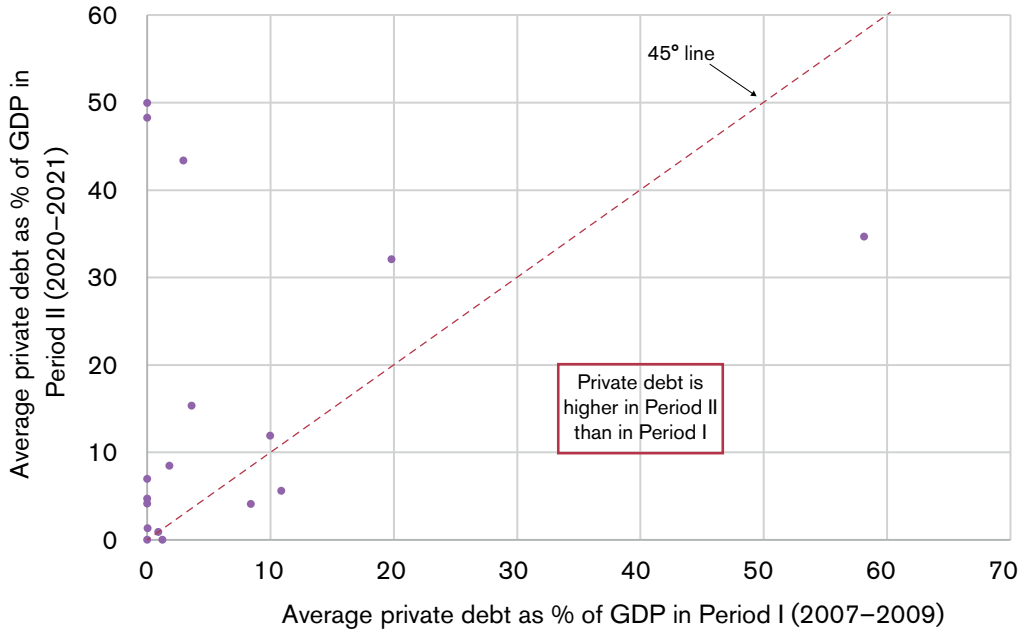
Comparing external private debt as % of GDP in SIDS: period of minimal disaster intensity (2007–2009) versus period of high disaster intensity (2020–2021). We carried out the analysis of private debt as a percentage of GDP in SIDS for two periods (see Figure 19).

Figure 18. Private external debt as % of total external debt



Source: Authors' calculation based on data from Kose et al. (2022)

Figure 19. Comparing external private debt as a percentage of GDP in SIDS: period of minimal disaster intensity (2007–2009) versus period of high disaster intensity (2020–2021)



Source: Authors' calculation based on data from Kose et al. (2022)

When examining the private external debt levels as a percentage of GDP for SIDS over these two distinct periods, a clear divergence in trends emerges, underscoring the profound economic implications of disasters.

- **Period I: stable or low debt accumulation**. During the period of minimal disaster intensity, many SIDS displayed relatively stable or low private external debt levels. The absence of significant disaster-related disruptions allowed these countries to maintain or even reduce their borrowing, as their economic activities were not severely affected. For instance, countries like St Lucia, Cabo Verde and Haiti had minimal or no private external debt growth during this period.
- **Period II: surge in debt amidst high disasters**. In contrast, the period marked by high disaster intensity saw a noticeable escalation in private external debt levels for several SIDS. With economic disruptions and often limited internal resources, many SIDS resort to external borrowing. Guyana, for example, saw its private external debt jump significantly in Period II. Similarly, the Dominican Republic and Fiji witnessed a surge in their private external debt levels. While it's evident that high disaster intensity drives up private debt levels, the magnitude of this increase also varies across countries.

The surge in private external debt for many SIDS during this period underscores the immediate and lingering economic challenges posed by significant disaster events and exacerbates the present-day economic challenges for SIDS. The magnitude of this burden is expected to increase over the next decade, as credit rating downgrades can be expected to increase the cost of public borrowing, making it more expensive to invest in recovery or build resilience for future impacts. The unique vulnerabilities and limited fiscal space in many SIDS make access to concessional financing and favourable borrowing terms from official creditors particularly important in managing debt sustainability.

2.6 Deepening debt crises have cascading impacts

Over 70% of SIDS are grappling with worrying financial indicators that signal an impending or deepening debt crisis. A significant concern is the spiralling debt-to-GDP ratio, which for many of these nations has reached alarming thresholds. When a country's debt-to-GDP ratio escalates, it indicates a growing discrepancy between its economic output and debt. For SIDS, this divergence is often exacerbated by the unforeseen costs they incur in rebuilding and rehabilitation after climate catastrophes. The financial drain doesn't stop there, and these states frequently run in to substantial fiscal deficits, due to unplanned expenditures necessitated by climatic events.

Additionally, the very structure of the debt these nations incur, as explained in the earlier sections, presents additional layers of vulnerability. A significant portion of the debt shouldered by SIDS is external, making them susceptible to the variations of global financial markets, exchange rate fluctuations and international economic downturns. This external dependence is coupled with an internal fiscal challenge: volatile tax revenue streams. Many SIDS have economies heavily skewed towards sectors like tourism, which are intrinsically vulnerable to climate events and global economic downturns. Consequently, their tax revenues are often erratic, complicating fiscal planning.

But the implications of this debt situation are not merely financial. Countries faced with debt crisis become constrained on expenditure in other crucial areas of development and resilience building. Investments in social protection schemes, which provide considerable safety nets to communities in the face of climate risks, often takes a backseat. The repercussions of this can be profound, leading to increased poverty rates, widening inequality and social unrest.

Moreover, the global community's ambitious Sustainable Development Goals (SDGs), which aim to address a range of challenges from health to education to environmental protection, can become increasingly unattainable for debt-ridden SIDS. Funds that could be channelled towards these goals are instead being diverted to service mounting debts.

Here, the role of climate finance is also under question. In 2020, out of US$68.3 billion of climate finance provided by developed countries, 71%, or US$48.6 billion, was in the form of loans (including both concessional and non-concessional) (OECD, 2022). Around half of climate finance provided to SIDS in 2017–2018 was in the form of loans, which added more debt. Furthermore, all SIDS received a combined US$1.5 billion in climate finance between 2016 and 2020. But in the same period, 22 SIDS paid more than US$26.6 billion to their external creditors — almost 18 times as much as they received in loans (Fresnillo and Crotti, 2022).

For the SIDS, breaking free from this vicious cycle is not just an economic imperative but a question of survival. The intertwined challenges of climate change and debt require a concerted, multifaceted response from the international community, including measures such as debt relief, concessional financing and substantial climate finance.

3

What debt relief mechanisms are available for SIDS?

3.1 Existing debt relief efforts are limited and not fit for purpose

Unlike individuals or companies, there is no established international insolvency mechanism for countries at the risk of default to initiate debt relief negotiations with their creditors. Instead, countries have relied on prevailing practices, contracts or patchy debt relief options emerging from international negotiations and conventions (Aboneaaj, Estes and Landers, 2022).

One of the early precedents and a success story of debt relief emerges from the United States 'Brady Plan' that was initiated for Mexico in 1989. The plan offered creditors three choices to restructure their debt: reduce the principal, reduce interest or maintain both and provide new loans. Most creditors opted for the first two options, and the reduced debt service burden on the country combined with economic reforms helped usher in a period of improved economic growth for Mexico (Aboneaaj, Estes and Landers, 2022).

In 1996, the World Bank, the IMF and other bilateral creditors, led by the United States, launched the Heavily Indebted Poor Countries Initiative (HIPC), aiming to reduce the external debt burdens of qualifying countries. Over the years, HIPC has provided debt relief packages to 37 countries, with 31 of them in Africa, resulting in approximately US$76 billion in debt-service relief (IMF, 2023). Bilateral creditors, including the United States, have played a significant role in funding debt relief under HIPC, with multilateral institutions and select private creditors also contributing. However, despite the success in reducing bilateral debt burdens, countries still faced the challenge of servicing multilateral debt. To address this, the Multilateral Debt Relief Initiative (MDRI) was established in 2005. The MDRI aimed to provide 100% debt relief for claims from the IMF, the World Bank's International Development Association (IDA), and the African Development Bank (IMF, 2019). While the MDRI achieved substantial reductions in multilateral debt, creditor countries agreed to compensate the international finance institutions for the forgone reflows associated with the relief. However these obligations and arrears have not been met by countries. For example, the United States had US$2000 million unmet MDRI commitments in 2022 that it had promised to pay to the African Development Fund (AfDF) and to the World Bank's IDA (Aboneaaj, Estes and Landers, 2022).

While HIPC, MDRI and some of the earlier debt relief measures met with some success, existing debt relief efforts are limited and not fit for purpose. In response to the COVID-19 pandemic, the IMF offered support through the Catastrophe Containment and Relief Trust, while the G20 created the Debt Service Suspension Initiative (DSSI). DSSI postponed rather than cancelled debt payments, making future recovery even more difficult for countries. In November 2020, the G20 and the Paris Club[4] set up the Common Framework

[4] The Paris Club is an informal group of creditor countries whose objective is to find sustainable solutions to sovereign debt payment difficulties. It operates according to six foundational principles: solidarity, consensus, information sharing, case-by-case, conditionality and comparability of treatment.

for Debt Treatments (Italian Ministry of Economy and Finance, n.d.). This sought to restructure sovereign debt according to traditional Paris Club terms (going beyond the postponement of debt payments under DSSI). But uptake of the Common Framework has been limited, with only three countries (Chad, Ethiopia and Zambia) seeking relief, as it lacks clear steps and timelines for bringing the creditors and parties of debt restructuring together (Aboneaaj, Estes and Landers, 2022).

The limited uptake and feasibility of recent debt relief measures are due to the changing landscape of global creditors in recent years. The effectiveness of HIPC and MDRI was based on multilateral and Paris Club lenders owning the bulk of poor countries' debt. However, in the years since, the share of HIPC debt stocks owned by private creditors such as bondholders, state-owned enterprises and non-Paris Club lenders, namely China, has grown significantly. These new actors, particularly China, are more inclined to pursue independent negotiations for debt restructuring, and do not conform to the principles of solidarity, consensus, information sharing and comparability of treatment that the Paris Club embodies. This evolving profile of creditors has posed a challenge, and existing debt relief efforts have failed to the create consensus between the main creditors.

3.2 Innovative debt relief solutions are available, but their scope is limited

Beyond some of the existing efforts of the World Bank, G20 and the IMF, some other innovative debt relief solutions are available, such as:

Pause clause, also known as a moratorium or standstill provision, is a contractual provision that allows a debtor country to temporarily suspend or delay its debt repayments to creditors during times of economic or financial crisis. The pause clause provides flexibility to debtor countries by granting them a grace period to address immediate challenges and implement necessary economic reforms without the burden of debt servicing obligations (Mustapha, Talbot and Gascoigne, 2023). This temporary relief can allow the country to redirect financial resources towards critical areas such as recovery efforts, social welfare programmes and economic stabilisation. The pause clause helps alleviate short-term financial pressures and provides breathing space for the debtor country to implement effective policies and restore economic stability before resuming debt payments. For example, in 2020, Zambia requested a suspension of debt payments under the G20's DSSI due to the economic impact of COVID-19. This allowed the country to redirect resources towards addressing the pandemic and supporting the economy.

Parametric insurance of sovereign debt involves providing parametric insurance cover for debt undertaken by a country (Bharadwaj, Mitchell and Karthikeyan, 2023). The insurance covers debt repayment on behalf of the country during a period of climate crisis, allowing the country time to recover without worrying about debt repayment during the crisis period. This goes far beyond a debt moratorium, where the debt remains and keeps getting accumulated for a later period. Here, debt repayments continue as normal through the insurance mechanism — and countries are freed from that burden during crisis, helping them to focus on relief and recovery. It can act as a safeguarding mechanism, provide immediate liquidity and reduce transaction costs compared to a sovereign debt restructuring process, which often comes with several conditionalities. It can bring stability in capital markets and help bring private creditors to the table. For example, although it was not directly parametric insurance of sovereign debt, in 2017, the Caribbean Catastrophe Risk Insurance Facility (CCRIF) paid out US$15.6 million to 13 member countries, including Antigua and Barbuda, after they were impacted by Hurricane Irma. The CCRIF's parametric insurance policies allowed for a quick payout to help with immediate relief efforts.

Debt reprofiling is a financial strategy used to modify the terms and conditions of existing debt obligations without necessarily reducing the overall amount owed. It involves extending the maturity dates, adjusting interest rates or restructuring payment schedules to provide temporary relief to debtor countries facing financial challenges. Debt reprofiling aims to improve the sustainability of debt burdens by aligning repayment obligations with a country's economic capacity, allowing for more manageable debt servicing and creating space for the implementation of long-term recovery and development plans (IMF, n.d.b). For example, in 2020, Argentina restructured US$65 billion of its sovereign debt, pushing back repayment deadlines and reducing interest rates. This was done to help the country avoid default and address its ongoing economic crisis.

Debt swaps (IIED, n.d.), also known as debt-for-nature swaps or debt-for-climate swaps, are agreements whereby a debtor country exchanges its outstanding debt with a creditor country or organisation for investments in environmental conservation, social development or other priority areas. The debtor country can use the amount of debt relieved for funding sustainable projects, such as protecting biodiversity, supporting renewable energy initiatives or improving healthcare and education. Debt swaps provide an opportunity to address both the financial obligations of the debtor country and promote sustainable development, contributing to long-term resilience and economic growth while relieving the debt burden. For example, in 2020, Seychelles announced plans to swap

US$30 million of its sovereign debt in exchange for protecting and restoring its marine ecosystems. In 2022, Belize's national debt refinancing unlocked US$180 million for ocean conservation (the Belize Barrier Reef Reserve System). This debt-for-nature swap was designed to help the country address the impacts of climate change on its economy and environment.

Resilience bonds are financial instruments designed to raise capital for projects that enhance resilience to climate change and natural disasters. These bonds are issued by governments, municipalities or organisations and are backed by the revenue generated from resilience-building projects, such as infrastructure upgrades, flood mitigation measures or renewable energy installations. Investors purchase these bonds, and the proceeds are used to fund the projects (Global Center on Adaptation, n.d.). The unique aspect of resilience bonds is that their performance and returns are linked to specific resilience metrics, such as reduced vulnerability, enhanced adaptation capacity or improved disaster response. If the resilience goals are achieved, investors receive their principal and potential returns. Resilience bonds incentivise investment in climate resilience and provide a financial mechanism to support long-term sustainability and adaptation efforts. For example, in 2019, the government of Mexico issued a US$485 million catastrophe bond to help cover losses from earthquakes and tropical cyclones. The bond was designed to provide the country with financial resources to quickly respond to disasters and support its long-term resilience efforts.

3.3 Advantages and limitations of debt relief options

We have analysed the advantages and limitations of different debt relief measures in Table 1.

While these existing innovative debt measures may offer relief to SIDS, they also have certain limitations:

- Each have different costs and deliver different levels of support during crisis
- These options can only work well in certain contexts
- Each of these debt relief options are suitable for providing support in different phases of recovery and not all.

Also, for countries with unsustainable debt, one debt relief measure cannot restore solvency unless it involves a sufficiently large share of a country's debt and substantial relief. So far, no debt relief measure has come close to achieving this.

Table 1. Advantages and limitation of some existing debt relief options

ADVANTAGES	LIMITATIONS
Immediate term	
Pause clause in sovereign debt	
▪ Provides immediate relief to countries experiencing financial difficulties due to a crisis, such as a climate disaster. ▪ Allows countries to redirect resources towards disaster response and recovery efforts instead of servicing debt payments. ▪ Can provide a breathing space for countries to stabilise their economy and implement necessary reforms.	▪ May lead to increased costs in the long run due to accumulating interest and extended repayment periods. ▪ Could impact the country's creditworthiness and access to future borrowing. ▪ Lack of universal adoption or standardised clauses may limit its availability in certain debt agreements. ▪ Can discourage investors from lending to countries with pause clauses in their debt contracts.
Parametric insurance of sovereign debt	
▪ Provides a predictable source of funding to countries in the event of a disaster, which can help to cover emergency response costs. ▪ Can help countries to access financing quickly, without needing to go through lengthy approval processes. ▪ Can provide a measure of stability and certainty to investors, which can make lending to developing countries more attractive.	▪ Premium costs can be relatively high, especially for countries with higher risks. ▪ Can be difficult to determine the appropriate level of coverage needed, which can lead to under-insurance or over-insurance. ▪ The effectiveness of parametric insurance depends on accurate and reliable data for trigger activation.

ADVANTAGES	LIMITATIONS
Short to medium term	
Debt reprofiling	
▪ Provides immediate relief by restructuring debt obligations, reducing interest rates, or extending repayment periods. ▪ Enhances fiscal sustainability and improves debt service capacity. ▪ Can help to prevent defaults, which can have negative consequences for both the country and its creditors.	▪ May lead to credit rating downgrades and increased borrowing costs. ▪ Requires cooperation and negotiations with creditors, which can be complex and time-consuming. ▪ Restructuring agreements may involve conditionality and policy reforms imposed by creditors.
Debt swaps	
▪ Can provide additional financial resources for nature conservation and climate-related projects or initiatives. ▪ Reduces debt burdens and debt service obligations. ▪ Incentivises environmental conservation and sustainable development through debt-for-nature/ climate swaps.	▪ Requires cooperation from creditors and negotiations for debt restructuring. ▪ The amount of debt relief may be limited compared to the overall debt burden. ▪ Debt swaps may have specific eligibility criteria or conditions that limit their applicability.
Long term	
Resilience bonds	
▪ Can provide a way to finance climate resilience and adaptation projects in developing countries, which may not have the resources to invest in these projects on their own. ▪ Can help to attract investment from a wider range of investors, including those who are motivated by environmental and social objectives. ▪ Can provide a measure of predictability and stability to investors, which can make it easier for countries to access financing in the future.	▪ Requires a well-developed and reliable pipeline of climate resilience projects to attract investors. ▪ Structuring and issuance costs can be relatively high. ▪ Vulnerable to market conditions and investor sentiment, which may impact bond pricing and demand.

4

Beyond 'reactive fixes': Building longer term debt sustainability

The irony is bitter — as climate change intensifies and its impacts on SIDS become more severe, they will find themselves less equipped to deal with these challenges. Their ability to invest in adaptation and resilience will diminish with each dollar allocated to debt repayment. This reality presents a paradox where every new climate disaster not only brings immediate devastation but also undermines the nation's future ability to respond, pushing it further into debt.

In this document we set out four propositions for taking SIDS towards longer-term debt sustainability:

1. Debt alleviation. Debt alleviation will provide immediate fiscal relief. By reducing or clearing the outstanding liabilities, nations can breathe more easily, releasing funds previously earmarked for debt servicing. This action will not only alleviate immediate economic strain but also pave the way for infusing investments in core areas of growth and development.

2. Future protection. In the face of unpredictable climate challenges, ensuring future protection for SIDS is important so that they do not fall into the cycle of debt distress again. By instituting robust safeguards, such as insurance products that limit economic losses from climate-related disasters, countries can gain a shield against unforeseen adversities. This proactive measure can instil a degree of financial predictability and security, essential for sustained growth and stability at a time of climatic uncertainty.

3. Longer-term resilience investment. Beyond immediate interventions, the long-term prosperity of SIDS hinges on resilience building. This entails strategic investment of resources into sectors that bolster their ability to withstand and bounce back from shocks, be they climate-induced or economic. Investments in infrastructure, development and community-level resilience building efforts can fortify SIDS against future challenges, ensuring they not only survive but thrive in the face of global challenges.

4. Legal aid and advisory support. The complexities surrounding debt negotiations, international contracts and resilience-building initiatives necessitate specialised legal guidance. With legal aid and advisory support, SIDS can navigate these intricacies more effectively, ensuring their interests are protected and advanced in international fora. This assistance will empower them to make informed decisions and engage in dialogues while protecting their interests and promoting their needs and aspirations.

We have explained how each of these options might work in separate sections, but it is crucial to emphasise that to take SIDS towards a longer-term debt sustainability and secure their future through sustainable and resilient growth and development, they need to be implemented as a package.

5

Debt alleviation

We are proposing two viable solutions for the pressing debt issue: firstly, a multi-layered, comprehensive debt relief, which entails a strategic layering of various existing debt relief measures, ensuring a tailored approach that addresses the multifaceted nature of SIDS' debt. This would enable these nations to benefit from a combination of short-term relief and long-term structural adjustments, bolstering their resilience and promoting sustainable development. Secondly, considering the acute challenges faced by SIDS, a complete write-off or buyout of their debt stock offers a more radical yet immediate remedy. This would free up resources, allowing these nations to invest in infrastructure development, longer-term climate resilience and socioeconomic betterment, ensuring their more sustainable and resilient future.

5.1 Multi-layered comprehensive debt relief

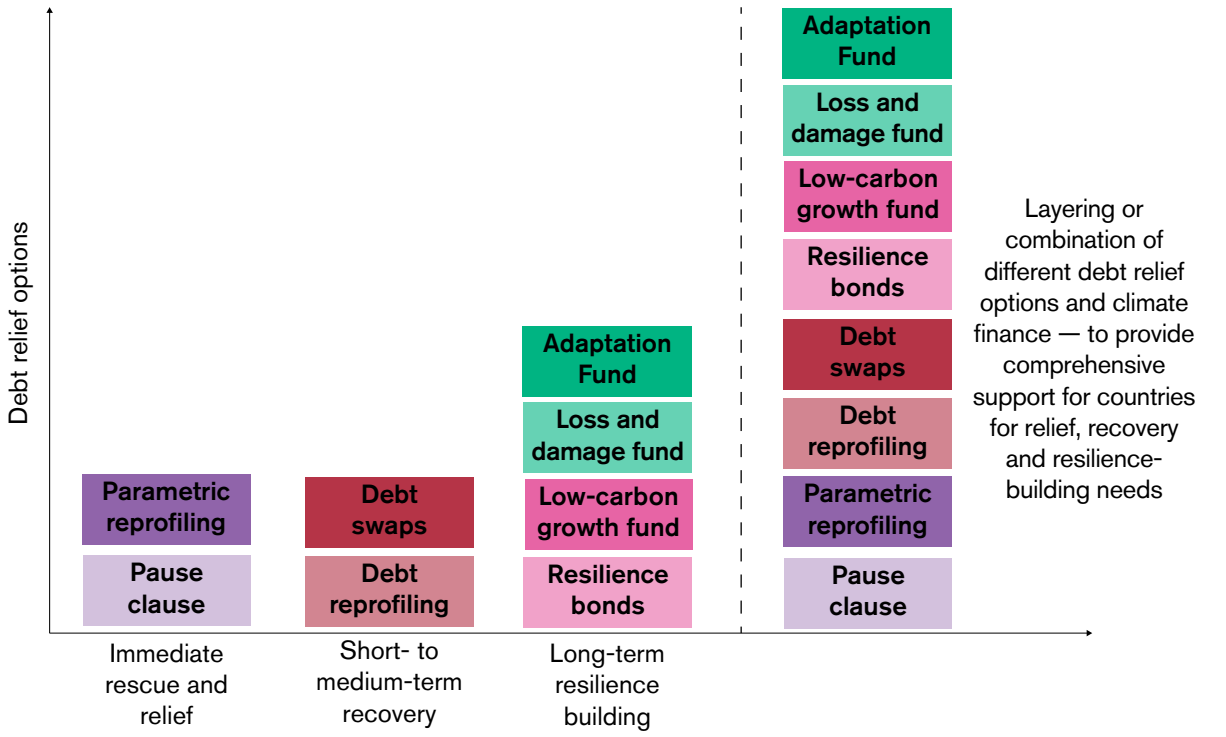
When a country is hit by a climate disaster, different types of funding support are needed to help it recover from both climate and debt crises. Funding needs can be typically divided into three phases: immediate relief and support; medium-term recovery; and longer-term resilience building. Lack of support in any of these phases can negatively impact the population and the economy, undermine their capacity for coping with such disasters in future and push countries into downward spirals of debt. SIDS need financial assistance in all three phases of post-disaster recovery to allow them to adequately prepare, cope and recover from recurring climate shocks.

To date, no existing debt relief measures have adequately met these needs, and helped a country get its economy back on track after being hit by a disaster or series of disasters. Therefore, a combination of debt relief packages would work best in restoring solvency and covering their recovery needs over the short, medium and long term. Measures to support climate investment would need to be further layered to support longer-term resilience and protection from future climate impacts.

The analysis in Table 1 shows that the effectiveness and suitability of these debt relief measures may vary depending on the specific circumstances and requirements of each country, and they may only be suitable for a particular phase of post-disaster recovery or not all. On the other hand, using a combination of debt relief options such as the pause clause in sovereign debt, parametric insurance, debt reprofiling, debt swaps and resilience bonds may provide a more comprehensive and sustainable solution (also see Figure 20):

1. **Immediate relief and recovery:** The pause clause in sovereign debt allows countries to temporarily suspend debt payments, providing immediate relief and freeing up financial resources to address the urgent needs after a climate disaster. Parametric insurance, at the same time can provide quick payouts for debt repayment based on pre-determined triggers, enabling countries to use their budgets for emergency response and recovery efforts.
2. **Debt restructuring and reprofiling:** Debt reprofiling, such as extending repayment terms or reducing interest rates, can provide medium-term relief by easing the debt burden and allowing countries to allocate resources towards recovery and resilience building. These measures can be combined with debt swaps, where a portion of the debt is exchanged for investments in climate resilience projects, providing additional funding and aligning debt restructuring with climate goals.
3. **Long-term resilience and climate financing:** Resilience bonds can be utilised to attract investment specifically for climate resilience projects and initiatives. By issuing resilience bonds, countries can secure long-term financing for resilience-building efforts, ensuring sustained support for climate adaptation, infrastructure development and disaster risk reduction measures. in addition, countries will also need access to climate finance for adaptation, addressing loss and damage and supporting low carbon growth.

Figure 20. Debt relief option in different timeframes and multi-layered approach



5.1.1 How can multi-layered debt relief work in practice?

To illustrate the need for layering debt relief options and how it might work in the context of SIDS, we analysed the sovereign debt data of SIDS countries from the IMF's global debt database (IMF, n.d.a) and the data of climate change loss and damage from figures of the Emergency Events Database (EM-DAT), based on disasters between 1990 and 2021.

We analysed the debt profile, the number and scale of disasters and their associated losses and the change in the debt profile of SIDS in the years they were impacted by disasters. To work out how debt layering might work in SIDS to protect them from debt default, we adopted the following approach:

Stochastic modelling. We used stochastic modelling based on the EM-DAT emergency events database for SIDS. Stochastic models are tools used to estimate and assess the potential losses and impacts of large-scale disasters or catastrophic events, such as hurricanes, earthquakes or floods. In simple terms, if we want to know the probability of a hurricane causing damages exceeding US$1 million to a specific area, the stochastic model uses historical data, scientific analysis and other relevant information to simulate thousands of possible scenarios and calculate the likelihood of losses exceeding US$1 million. This probability is represented as a percentage or fraction (Cebotari and Youssef, 2020).

For our analysis, we developed a stochastic model to work out the probability distribution and values of loss and damage caused by natural disasters based on the historical data. We used the frequency and volume of loss and damage caused by natural disasters to simulate and predict the potential consequences of these events, including the extent of economic losses. The model output provided insights into the potential financial impacts of catastrophic events, which helped inform how the debt relief strategies might be layered to mitigate debt default.

Estimation of loss exceedance probability. Loss exceedance probability (LEP) in stochastic models refers to the likelihood or probability of experiencing losses beyond a certain threshold or level. It helps estimate the chance of a stochastic event causing damages that exceed a specific predefined amount (Humphreys, 2022). For example, a LEP of 5% means that there is a 5% chance of experiencing losses beyond US$1 million due to a hurricane or a similar catastrophe. This information helps governments and other stakeholders assess the potential financial risks and make decisions about emergency response plans and investment in mitigation measures.

LEP is a critical component of stochastic models, as it provides insights into the potential severity and frequency of catastrophic events, aiding in risk management and decision-making processes. We worked out the LEP for SIDS by running 10,000 simulations. The loss exceedance curve based on the disaster data of all

SIDS is provided in Figure 21. At a 5% LEP, there is a possibility that the value of loss and damage may surpass US$5.11 billion and at a 50% LEP, the loss value is projected to exceed US$1.34 billion.

In the context of LEP and stochastic models, the attachment point refers to the threshold or level at which losses are considered to start accumulating or being counted. It represents the minimum loss value that needs to be exceeded for it to be included in the calculations of the LEP (Humphreys, 2022). For example, if we are analysing hurricane risks for a specific region, and we set the attachment point at US$1 million. This means that only hurricanes causing losses exceeding US$1 million will be considered in the LEP calculations. Any hurricane causing losses below this threshold will not be included.

We worked out the attachment point for SIDS to help us define the scope and severity of events that can be considered for triggering debt relief measures and focus on losses that are significant or relevant for debt relief. In Figure 22 we have presented the classification of all the disasters faced by SIDS and defined their attachment point based on severity of events. We used these attachment points to define the assumptions for debt relief measures.

Figure 21. Loss exceedance curve for SIDS

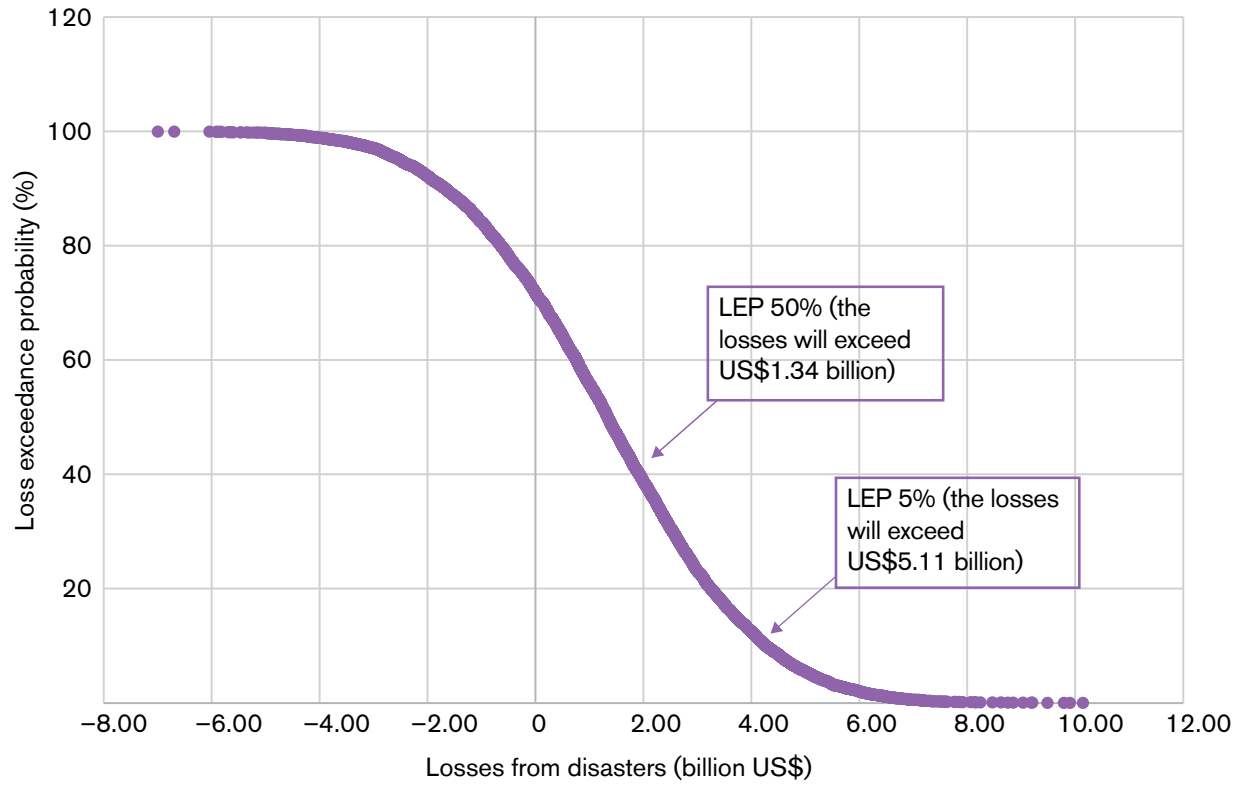
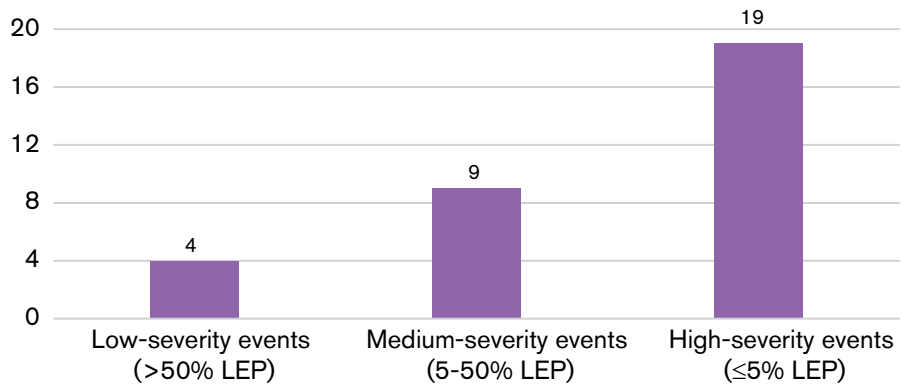


Figure 22. Classification of disasters based on severity from 1990–2021



Layering of debt measures. To work out the layering of debt relief measures, we assumed that the SIDS would experience a default in loan repayments at a LEP of 50% at which it can seeks debt relief options to mitigate the associated default risk. The attachment point for debt relief payouts would occur when the LEP reaches 5%. We have also assumed that the repayment terms for the sovereign debt was 20 years, with an interest rate of 5% with an annual repayment schedule.

To work out the layering we defined the following conditions:

- **Parametric insurance (PI):** When the LEP reaches 5%, the payout is activated, and the insurer disburses an amount equivalent to the yearly repayment installment.
- **Pause clause (PC):** For LEP greater than 5% and equal to or less than 50%, the creditor grants the debtor the option to temporarily suspend repayment for a period of six months.
- **Debt swap (DS):** The creditor country or organisation agrees to relieve 10% of debt stock for investment in climate/nature or resilience-building measures.
- **Debt reprofiling (DR):** For LEP greater than 5% and equal to or less than 50%, the creditor reduces the interest rate for the loan from 5% to 1%.
- **Resilience bond (RB):** The resilience bond helps countries raise capital for projects that enhance resilience to climate change and natural disasters, equivalent to 20% of payout.

To assess how layering might help in debt relief we have analysed two aspects: (i) impact on debt servicing and (ii) impact of reduction of total debt stock.

5.1.1.1 Impact of debt layering on debt servicing

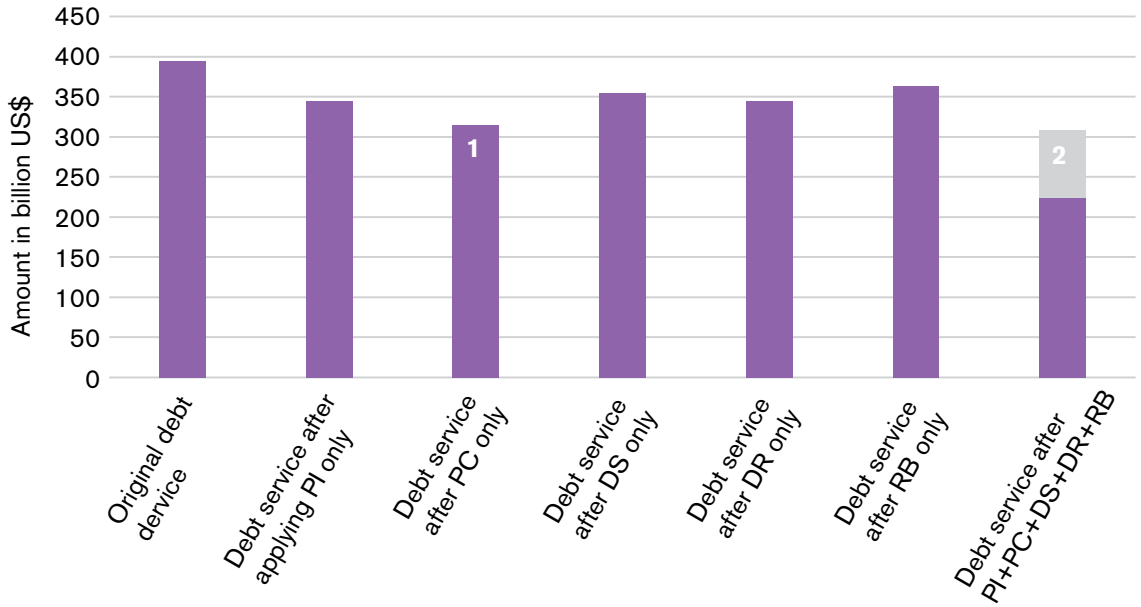
The impact of layering debt relief measures based on these conditions on debt servicing for SIDS is presented in Figure 23. The cumulative debt services done by SIDS (n-33) from 1990–2021 is US$394.78, and the figure provides analysis of how application of different debt relief measures can reduce this debt servicing.

We used the same analysis to calculate how the layering approach might reduce the current annual debt servicing of SIDS, which is presented in Table 2.

Such a layering can help SIDS alleviate the risk of debt servicing default and promote sustainable recovery as these measures would contribute to immediate relief, short- to medium-term recovery and long-term resilience building as follows:

- By having parametric insurance in place, when the LEP reaches 5%, the insurance payout will provide immediate financial relief, allowing the country to meet its debt obligations without depleting its resources or borrowing further.
- The pause clause will grant countries the option to temporarily suspend repayment for a period of six months, providing a breathing space and allowing them to redirect financial resources towards post-disaster recovery efforts.

Figure 23. Impact of layering of debt relief measures on debt servicing by SIDS



Note: 1 and 2 indicate the reduction in debt service due to pause clause. The debt servicing reduction is provided only in disaster hit years. However, there is no actual reduction in debt. The country still has to pay the debt in the subsequent years, which may lead to an increase in the overall debt due to interest paid for the repayment period.

Table 2. Reduction in annual debt servicing through layering of debt relief measures

REDUCTION IN ANNUAL DEBT SERVICE	AMOUNT IN BILLION US$
Annual debt servicing for the SIDS	12.34
Reduction if only parametric insurance (@5%LEP) is applied	10.79
Reduction if only pause clause is applied	9.83
Reduction if only debt swap is applied	11.08
Reduction if only debt restructuring is applied	10.79
Reduction if only a resilience bond is applied	11.33
Reduction after layering all measures	9.49

- Debt swaps will allow the relieved amount to be used by the debtor country to allocate resources towards measures that address the underlying causes of the debt crisis while promoting sustainability.
- Reducing the interest rate through debt reprofiling will help reduce the immediate burden on the debtor country, providing it with more time to generate revenue, rebuild its economy, and allocate resources towards recovery and resilience-building efforts.
- Finally, the resilience bond will allow countries to raise additional financing to invest in long-term resilience measures, such as infrastructure improvements, early warning systems and community preparedness, which can mitigate the impacts of future disasters and reduce the risk of future debt crises.

The analysis shows that layering of debt relief measures could serve as a catalyst for GDP growth in SIDS. The combined effect of different relief options could help SIDS achieve a more holistic and significant reduction in their debt burdens. This comprehensive alleviation could free up substantial fiscal resources, allowing these countries to redirect funds previously reserved for debt servicing into vital sectors of their economies, thus spurring economic growth. Moreover, the GDP growth trajectory would enhance investor confidence, further stimulating economic activities. From a broader perspective, the funds freed up from debt servicing could be channelled into critical development projects, advancing sectors like healthcare, education and infrastructure for climate resilience, ensuring that these countries are better equipped to face future climate challenges and safeguard their developmental gains.

Cost benefit of different debt relief options. It is also important to understand the cost implications of various debt relief options. In Figure 24, we have provided the estimated costs associated with each debt relief option for SIDS, offering an understanding of the financial outlays required for their implementation.

The debt restructuring option emerges as the most expensive, with a cost of US$49.62 billion. It is closely followed by debt swap, which has an associated cost of US$40.09 billion. The resilience bond is also a significant cost, priced at US$32.08 billion. The pause clause stands moderately in the spectrum, with a cost of US$28.65 billion. Among all the options, parametric insurance is the most affordable, with a cost of US$23.69 billion.

Figure 25 provides the estimated benefits each option can potentially yield.

In terms of benefits, parametric insurance and debt restructuring stand out, offering estimated benefits of US$49.35 billion and US$49.62 billion respectively. These two are the top options in terms of financial gains or reliefs. Debt swap follows closely, providing benefits worth US$40.09 billion, while the resilience bond offers benefits amounting to US$32.08 billion. A significant point to note is that the pause clause does not offer any real benefit as it merely involves postponement of debt payment.

To synthesise our analysis, the BCR that parametric insurance provides is 2.08, while debt swap, debt restructuring, and resilience bond options all have a BCR of 1.00. Pause clause does not offer any real benefit to the country.

5.1.1.2 Impact of layering debt relief on debt stock reduction

As of the latest available figures for 2021, US$153.75 billion is the total debt stock of SIDS (n-33). The impact of layering debt relief measures on the reduction of debt stock is presented in Figure 26.

In this analysis, we have only considered parametric insurance, debt swap and resilience bonds, as pause clause and debt reprofiling only impact debt servicing. A real reduction in overall debt stock would only be achieved by these measures.

Figure 24. Estimated cost of different debt relief solutions

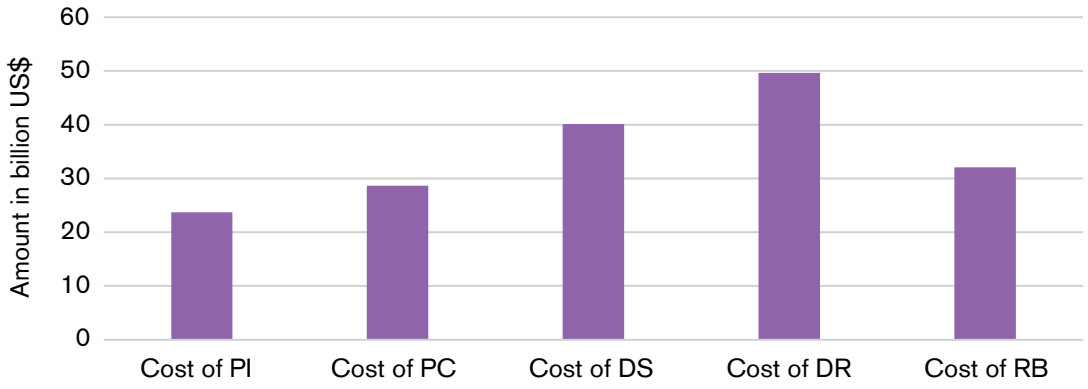


Figure 25. Estimated benefit of different debt relief solutions

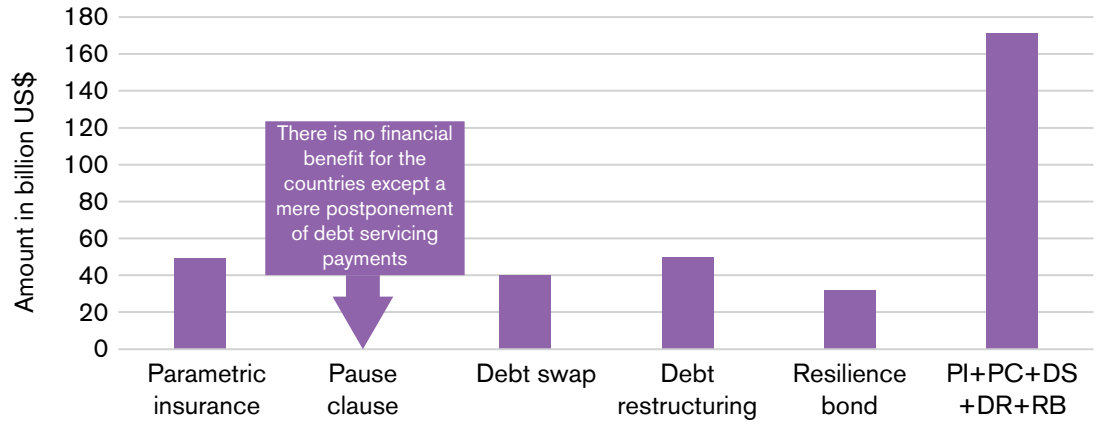
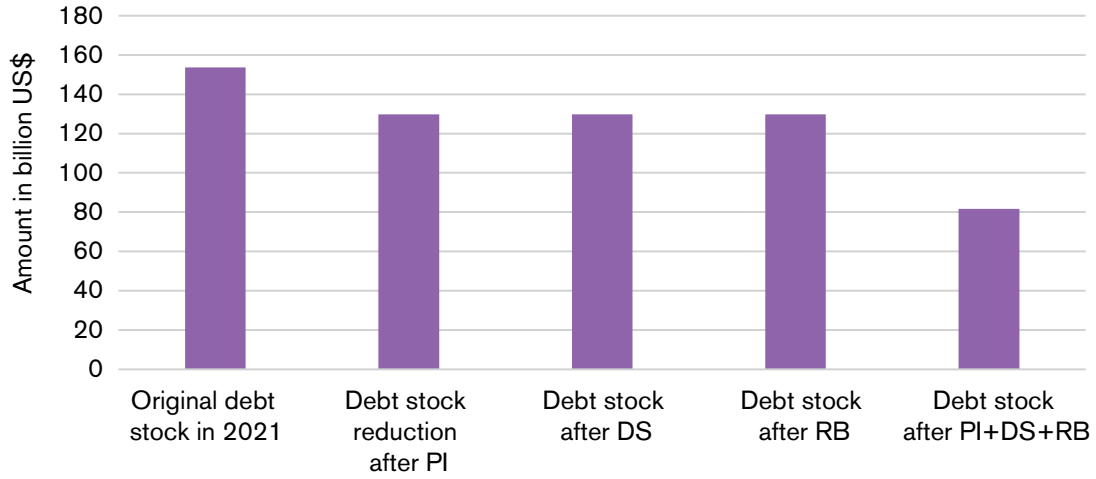


Figure 26. Impact of debt relief measures on debt stock reduction



To work out the layering, we defined the following conditions:

- **Parametric insurance:** When the LEP reaches 5%, the payout is activated, and the insurer disburses an amount equivalent to the debt stock.
- **Debt swap:** The creditor country or organisation agrees to relieve 10% of debt stock for investment in climate/nature or resilience-building measures.
- **Resilience bond:** The resilience bond helps countries raise capital for projects that enhance resilience to climate change and natural disasters, equivalent to 20% of debt stock.

Impact on GDP growth. Such a layering can help SIDS reduce debt stock, promote sustainable recovery and promote GDP growth. We simulated the change in GDP growth rate due to different debt stock reduction

options, based on the assumptions used in an IMF working paper by Greenidge et al. (2012), which developed an econometric model examining the long-run relationship between public debt and economic growth among 12 SIDS. Using the assumptions used in the paper we applied the conversion factor on each debt relief option — a 1% point increase in debt-to-GDP ratio would result in a 0.082%-point decline in the growth rate, given that the debt-to-GDP ratio is above an estimated threshold of 54.7%. Therefore, to achieve a minimum 1%-point increase in the growth rate, a 12.2%-point reduction in the debt-to-GDP ratio would be required. For each debt relief option, we ran 500 simulations on their actual growth data covering the last 31-years (1990–2021), and then worked out the mean probability of growth values. Figure 27 provides the probability of growth rate occurrence with different relief options.

Based on the probability of growth rate occurrence, we worked out the average change in growth rate due to debt reduction from different relief options, which is presented in Figure 28.

The analysis presented in this section is based on certain assumptions and the actual calculations might vary, depending on actual data on interest rates, repayment terms, conditions of different creditors, and so on. Our purpose in presenting this analysis is to illustrate why one debt relief measure might only provide partial support to a country struggling with debt default and would not be sufficient to take them out of a vicious cycle of indebtedness, and why layering might be needed.

Figure 27. Probability of growth rate occurrence with different relief options

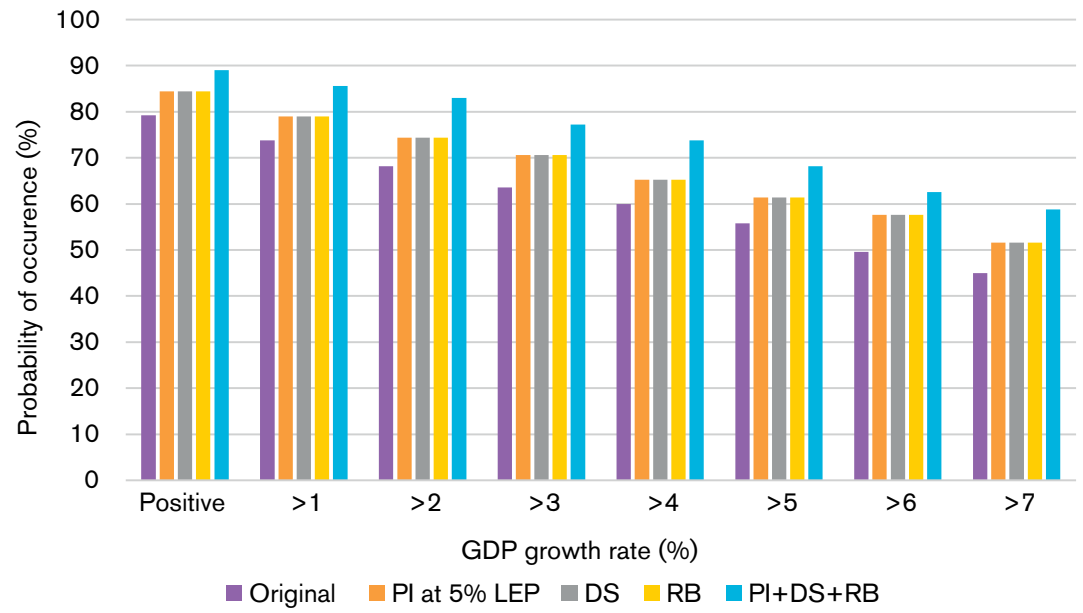
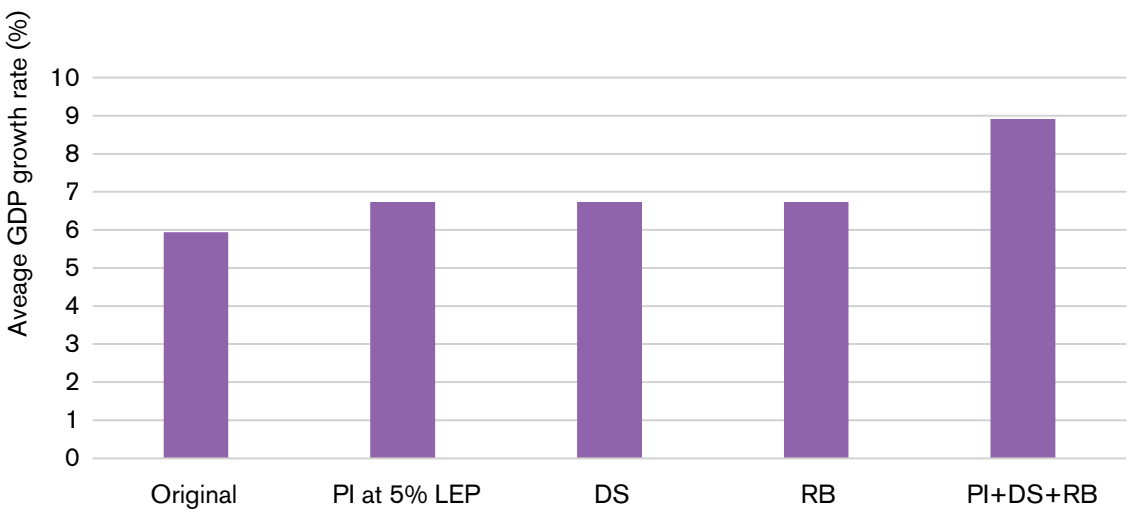


Figure 28. Probability of growth rate with different relief options



5.1.3 Advantages of layering debt relief and climate financing options

A combination of different debt relief and climate finance support can create more fiscal flexibility and less indebtedness for countries experiencing disaster cycles. Such a combination can be advocated as part of the risk layering approach alongside other risk mitigation and support mechanisms (such as humanitarian assistance or ODA). Some of the advantages offered by the layering approach are:

Comprehensive risk management. Different debt relief measures address different aspects of risk management. Parametric insurance provides coverage against specific climate-related events, such as cyclones or droughts, allowing countries to access immediate funds for response and recovery. Debt reprofiling and swaps provide opportunities to restructure debt payments and secure more favourable terms, easing the burden of repayment. Resilience bonds, on the other hand, enable countries to raise funds specifically for climate resilience projects. Layering these measures allows for a comprehensive approach to risk management, considering both immediate and long-term needs.

This layered approach will also recognise the multidimensional nature of climate impacts and the diverse financial needs that arise at different stages of recovery and resilience building. It will allow countries to access various sources of funding, align debt restructuring with climate objectives, and leverage private investment for sustainable and long-lasting solutions.

Enhanced financial flexibility. Layering multiple debt relief measures will provide SIDS with increased financial flexibility. Each measure will be able to tackle a specific aspect of debt management, allowing countries to access immediate relief, insurance coverage, restructuring options and innovative financing mechanisms. By combining these measures, countries can optimise their financial resources, manage debt obligations effectively, and allocate funds towards recovery and resilience-building initiatives. By layering different options, a country can also have a more robust financial safety net that can help them better manage future crises and minimise the negative impacts of climate change on their economy and communities.

Tailored solutions for specific needs. Each debt relief measure serves a specific purpose and can be tailored to meet the unique needs and circumstances of a given country. Layering these measures provides a more customised approach to debt management and climate resilience. For example, a country may opt for parametric insurance to cover immediate response costs, while simultaneously pursuing debt reprofiling to ease debt burdens and free up resources for longer-term recovery. Combining measures allows countries to design a comprehensive strategy that aligns with their specific requirements.

Diversification of financing sources. The combination of debt relief measures will provide SIDS with more diversified sources of finance. Parametric insurance and resilience bonds, for instance, offer alternative channels for accessing financial resources beyond traditional borrowing. Besides this, countries will also need access to humanitarian assistance, climate finance and ODA support. By diversifying their sources of funds, countries can reduce reliance on a single avenue and create a more robust and sustainable financial framework to address climate-related challenges.

5.1.4 Key considerations for layering of debt relief options

It is important to note that these advantages may vary depending on the specific context and implementation of debt relief measures. Additionally, the success of layering debt relief measures would rely on effective coordination, collaboration among stakeholders, particularly different types of creditors (including private creditors), and careful consideration of each measure's terms and conditions to ensure they complement each other and align with the country's adaptation goals and priorities. Some of the key considerations for layering of debt relief options that would be essential to designing an effective model are:

Debt sustainability assessment. The aim of combining debt relief and climate finance should be directed towards alleviating a country's debt burdens and improving their debt sustainability outlook, in other words, the country's ability to continue paying their debt, based on their growth rate, tax and revenue collection. Assessing debt sustainability typically involves analysing a country's ability to service its debt obligations without endangering its long-term fiscal health. Therefore, when designing a combination of different debt support measures, it will be important to consider factors such as debt-to-GDP ratio, debt service payments, debt maturity profiles and the country's capacity to generate enough revenue to continue paying its debt.

This assessment would also need to consider the types of climate disaster a country is exposed to, the current and likely future scale of impacts, which sectors of the economy, geographies and communities may be most impacted, what impact climate shocks might have on their GDP and tax/revenue collection, and how shocks might impact their ability to service debts. This will help in understanding the level of debt relief, period of relief and climate finance that will be needed by a country to tide it over a crisis and build long-term resilience without creating an additional debt burden. It would also help in assessing which of the debt relief options might work in different phases of disaster, individually

or in combination. But before deciding the optimum mix of different layers of debt relief and climate finance packages, a comprehensive multidimensional risk assessment would also be needed to identify potential risks and challenges associated with combining different debt relief options. This would include:

(i) Evaluation of the risks related to market conditions, including potential fluctuations in interest rates or exchange rates

(ii) Assessing insurance triggers and potential limitations of parametric insurance

(iii) Identifying legal and contractual risks associated with debt reprofiling, swaps, or bond issuances.

Based on the risk assessment, the layers of different debt relief measures will need to ensure adequate mitigation strategies for potential risks, to ensure the effectiveness and sustainability of the combined relief measures.

Financial implications. The value of a combined package of debt relief would need to be assessed against the financial implications of different debt relief options. This would require assessing the costs associated with implementing each option alone and in combination — undertaking a cost–benefit analysis, including how a pooled approach to supporting debt relief might work in comparison to individual support, liquidity or potential savings it would create in debt servicing payments, and its impact on the country's fiscal space. To assess the financial cost benefit of layering debt relief measures, it will also be important to consider the creditor profile and whether the private creditors would come on board. This will define how debt relief might pan out. If private creditors don't agree the debt relief may only be partial.

Ideally, such an analysis will need to consider the existing debt profile, the scale and nature of debt taken by country after a climate crisis and how it is spent, in other words, how much of the new debt goes in to servicing existing debt, or providing immediate relief after a disaster or long-term resilience building. This should also explore whether the terms of debt for a country change after each climate crisis and whether this has a significant implication on borrowing costs and credit rating, including the type of creditors countries have access to or whether there are only a particular type of creditor available to countries as a last resort.

The financial assessment will also need to include the availability or lack of availability of additional sources of finance such as climate finance, humanitarian assistance, ODA or FDI, and the form (grant, loans or concessional loan) in which they flow into the country, and consider the feasibility of securing favourable terms, such as grants, lower interest rates or longer repayment periods in debt restructuring options.

The cost assessment would also need to carefully weigh the trade-offs between fiscal costs of implementing the debt relief options and not providing such support, in terms of impacts on SDG achievement, risks to growth, debt default and cost of debt restructuring after a country slips into economic crisis. Such an assessment will need to use the existing evidence on how much GDP of a country goes into debt servicing, compare debt and debt servicing over years with changes in budget allocation for different ministries (for example, agriculture, forestry, health, education and industry) and understand the effect of reduced budgets on jobs created in these sectors and a reduction in resilience investments. Reducing these investments makes it difficult for these countries to anticipate, respond to and recover from climate impacts, resulting in loss and damage. In these contexts, the benefits of providing this debt relief can far exceed the investment.

Policy coherence. When developing the debt relief package, it is important to ensure that the selected debt relief options align with the country's climate change adaptation and mitigation strategies and overall sustainable development objectives and contribute to the country's growth targets, national development priorities, Nationally Determined Contributions, National Adaptation Plans and Nationally Appropriate Mitigation Actions. Integration with existing policies and plans will enhance policy coherence and promote a coordinated approach to debt relief and resilience building.

Along with policy coherence, it will also be necessary to assess regulatory and legal frameworks for implementing the chosen debt relief options. It will be important to assess whether the country's legal system supports the proposed measures and whether any regulatory reforms or adjustments are needed. Addressing legal complexities and ensuring regulatory compliance will be vital for successful implementation of the combined debt relief measures.

The impact of the chosen measures will need to be assessed on:

(i) Macroeconomic stability. It will be crucial to consider the potential implications of the measures on inflation, exchange rates, fiscal sustainability and debt sustainability. The package should be designed in a way that it supports macroeconomic stability and avoids any adverse effects that could hinder long-term economic growth.

(ii) Social and environmental impacts. It is important to assess how the package of options contributes to social inclusion, poverty reduction and environmental sustainability. The measures should support equitable and sustainable development, avoiding negative consequences for vulnerable groups and ecosystems.

The debt relief measures will have to be flexible enough to accommodate evolving circumstances and changing policy and regulatory environments. The adaptability of the combined relief measures will ensure that they remain relevant and effective in supporting the country's recovery and resilience-building efforts. To ensure this, there will be a need to establish robust monitoring and evaluation mechanisms to track the progress and effectiveness of the combined debt relief measures. Regular evaluation of the effectiveness of the combined relief measures, and review and feedback mechanisms, will facilitate necessary adjustments or refinements based on results.

Stakeholder engagement and coordination. When developing a package of different debt relief and financing options, stakeholder engagement and coordination will play a crucial role in ensuring the effectiveness, transparency and legitimacy of the process — especially with those who will be affected by, or have a stake in, the debt relief and financing options. This will include government agencies, financial institutions, civil society organisations, local communities, international partners, and particularly the creditors. The debt profile of a country includes different types of creditors, who provide debt under different conditionalities. As an increasing proportion of global South debt is now owed to private creditors, and almost half of external debt and interest payments by low- and lower-middle-income countries are to private lenders (Jones, 2022), it will be important to have this group at the table. Excluding private sector creditors may lead to incomplete debt resolutions and hinder a country's ability to achieve long-term financial stability and sustainable development. It will be important to bring these creditors on board right from the early stages of designing a debt relief package and to explore which solutions might work for which type of creditor.

Ensuring the representation and participation of different types of stakeholders throughout the process will also help in getting diverse perspectives and inputs and promote open and transparent communication. This will encourage creditors to express their views, concerns and suggestions to foster an inclusive and participatory decision-making process. This will help in developing debt relief packages that are practically viable.

Along with stakeholder engagement, adequate institutional capacity and coordination mechanisms will be necessary for effective implementation and management of the combination of debt relief and financing options. This may require a comprehensive country-level diagnostic of existing institutional frameworks to identify potential gaps and areas for improvement. This may include assessing a country's technical capacity and expertise to implement and manage the chosen debt relief options, evaluating whether the necessary institutional structures, human resources and technical skills are in place, identifying any capacity gaps and developing plans for strengthening capacity, including training programmes or technical assistance, to ensure effective implementation of the combined relief measures. Strengthening coordination arrangements and institutional governance among relevant government agencies, financial institutions and international partners will be essential to ensure policy coherence, flow of funds and efficient implementation.

5.2 Complete write-off or buyout of SIDS debt stock

For many SIDS, debt poses a significant constraint that limits their ability to maintain expenditure in crucial sectors such as healthcare, education and infrastructure. But now, they must also address a more pressing concern: climate resilience. The very same funds that are currently directed towards debt servicing could be invested in projects aimed at bolstering resilience against the impacts of climate change. Whether it is investing in providing social safety nets to people exposed to climate disasters, or promoting sustainable agriculture to ensure food security in the face of unpredictable weather patterns, or creating infrastructure that can withstand intense cyclones, there's an urgent need to redirect resources to resilience building.

A radical proposal — a complete write-off or buyout of all SIDS debt stocks is needed to correct the historical imbalance, in which they face recurring catastrophic climate change impacts despite not contributing to it. It will provide them with a level playing field to focus on future climate resilience. This approach is essential when viewed through the lens of solidarity and shared future.

A complete write-off or buyout would also provide SIDS with the opportunity to invest in research, knowledge sharing, community-based projects and capacity-building initiatives that will empower them to anticipate, respond to, and recover from climate impacts.

5.2.1 What could complete debt write-off or buyout lead to?

The total debt stock of SIDS (n-33) as per the latest available figure for 2021 is US$153.75 billion. The complete write-off or buyout of debt for SIDS would be in the range of US$165–175 billion assuming growth in the debt levels and figures for 39 SIDS.

A complete write-off or buyout of SIDS debt will not only offer immediate fiscal relief but can also act as a catalyst for sustainable, inclusive growth and faster progression towards achieving the SDGs.

Impact on GDP growth. In Figure 29 we have analysed the projected effect of the write-off option on the GDP growth rate of SIDS.

The actual GDP growth rate of SIDS in 2019 was 0.53. If complete debt write-off was done for the same year the GDP growth would have been 12.73. Similarly in 2020, a COVID-19 and high disaster year, the GDP growth rate was –12.42. If debt write-off was done in that year the negative GDP growth would have been restricted to –0.22.

This is because a debt write-off would provide immediate relief and infuse liquidity into the economy, acting as an immediate financial catalyst. Historically, debt servicing has consumed substantial portions of national budgets for close to 70% of SIDS, who are forced to divert funds that could otherwise be used to support growth. With this burden alleviated, governments would be able to allocate resources, possibly adopting expansionary fiscal policies, which could catalyse job creation, stimulate infrastructure development, and spur demand, all of which collectively can have a multiplier effect on economic activity. As consumer spending and business activities escalate, it would have a positive impact on GDP. Furthermore, in the absence of overarching debt, these nations could potentially benefit from reduced borrowing costs. When lenders perceive a country as lower risk, they are more likely to offer loans at more favourable interest rates for resilience and development projects. The increased economic activity resulting from such investments could potentially augment government revenue via taxes, which, when reinvested, could sustain and potentially elevate GDP growth over extended periods.

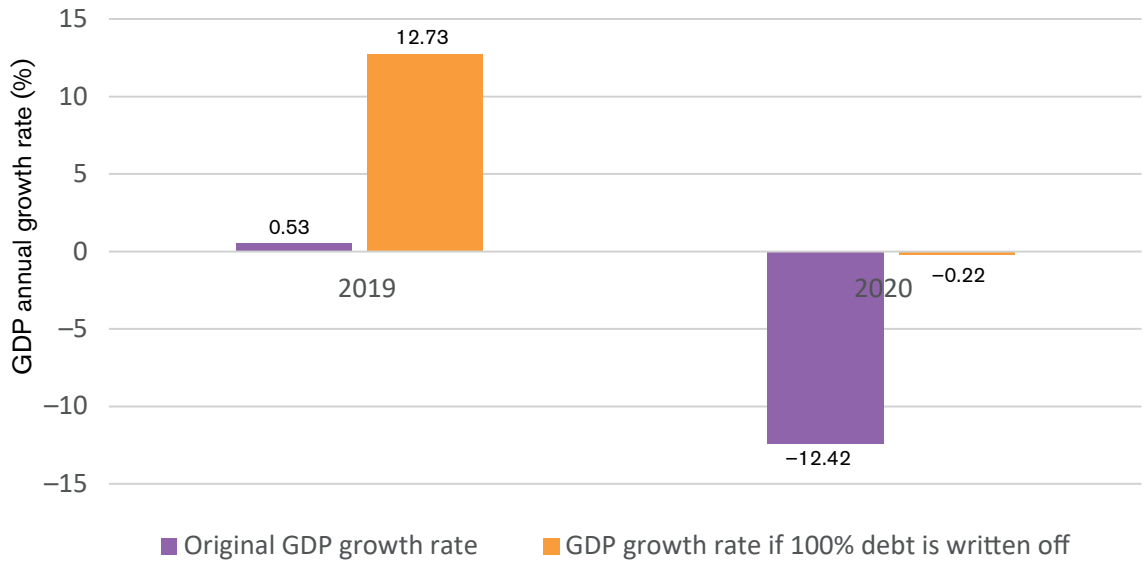
Investment in social protection, SDG and climate resilience. With the alleviation of debt, there would be an opportunity for SIDS to channel investments into building resilience against climate threats. For example, to improve infrastructure, they could embark on constructing robust seawalls or cyclone shelters to protect communities from climate impacts. Beyond physical infrastructure, they can also invest in community resilience, disaster preparedness, research in climate-resistant crops to ensure longer-term food security, conservation of marine ecosystems protecting biodiversity and bolstering fisheries, which are a significant source of livelihood for many SIDS. With more predictable fiscal space, SIDS could allocate more funds to social safety nets, such as unemployment benefits, pensions, child protection schemes and health insurance. Social protection programmes can help governments to address inequality and poverty, ensuring that vulnerable populations are taken care of, leading to a more inclusive growth and development trajectory.

5.2.2 Key considerations for debt write-off or buyout

The decision to write-off or buyout SIDS debt, while transformative, will require a multifaceted approach. Key considerations for effective debt write-off or buyout include:

Economic impact. The relief from debt write-off, while providing immediate fiscal breathing room, could also support a vision for the long-term health of the economy. This will require re-evaluation and potential reshaping of domestic fiscal and monetary policies. The funds that once went towards debt servicing can be

Figure 29. Projected effect of write-off option on GDP growth rate of SIDS



channelled to pivotal areas that address both present and future challenges. Investing in resilience building can fortify SIDS against external shocks, particularly from climate change. Prioritising low-carbon growth can help SIDS focus on sustainable growth. Simultaneously, ramping up investments in foundational sectors like infrastructure, education and healthcare will help drive community-level resilience in these sectors.

Legal and contractual implications. The SIDS' accumulated debt portfolio is governed by a series of contracts, each with its set of terms, conditions and legal provisions. Disentangling from these obligations would not only be a financial exercise but also a legal one. Contracts would require careful renegotiation to ensure they do not lead to legal disputes or financial penalties. It would be important to undertake a meticulous review of these agreements, consulting with legal experts to ensure that the debt alleviation process carefully considers and manages any potential consequences for SIDS.

Impact on international financial markets. Financial markets thrive on stability and predictability. A complete debt relief for SIDS would unsettle markets due to its unprecedented nature. Credit rating agencies might recalibrate their ratings in response, which in turn could influence the cost and availability of future borrowings for SIDS. Furthermore, the global investor community with its diverse set of actors could interpret this move in various ways. Some might see it as an indication of potential economic growth, making SIDS an attractive investment destination. Others, more cautiously, might perceive total debt relief as an indication of potential financial mismanagement, making them wary of future investments.

It would be important to manage these perceptions via outreach to different stakeholder groups. It would also be useful to bring together a range of stakeholders in this process, from the governments, civil societies and the private sector to external entities like the World Bank and the IMF, each bringing their unique perspective to the table. Ensuring their insights are integrated into the debt relief provisions would not only enrich the process but also secure wider support, lending legitimacy and credibility to such an initiative. Coordinated efforts, especially with major international bodies, would ensure a decision is not just symbolic but also beneficial in real terms to all involved.

Long-term development strategy. With the significant fiscal resources that would be freed from debt servicing, SIDS would have a unique opportunity to design their path forward. Their strategy would need to incorporate a judicious mix of immediate needs and long-term goals. Given the heightened vulnerability of SIDS to climate change, a significant investment would need to be directed towards climate resilience. From infrastructure that can withstand both slow-onset and rapid climatic events, to initiatives that conserve and rejuvenate their rich biodiversity, the SIDS would need to design resilience measures to proactively ensure a sustainable future for their communities.

6

Future protection

The increasing frequency and intensity of climate-related events pose a continuous threat to the economies and livelihoods of SIDS. SIDS have repeatedly faced devastating economic setbacks due to climate-related disasters. As noted previously, the damages inflicted by a single extreme event have in some cases surpassed the annual GDP of the affected SIDS. These shocks have not only reversed developmental gains but also strained their financial capacities, limiting their ability to rebound effectively. In Figure 30 we have provided the loss and damage caused by disasters in SIDS (1990–2021) based on the EM-DAT emergency events database for SIDS.

While debt relief is much-needed to provide immediate fiscal breathing space after such disasters there is also a need to immunise SIDS against future climate-induced financial shocks. Without a more long-term, protective measure in place, these countries will remain precariously exposed. Even after large-scale debt relief now, they could still be exposed to similar crises in future.

The 'future protection' concept is rooted in the idea of insulating these vulnerable nations from extreme economic fallout due to future climate impacts. The proposition is to limit the economic losses experienced by any individual SIDS from climate-related disasters to a level from which they can easily get their economy back on track without resorting to debt. This is planned to be achieved through an integrated approach that combines insurance with other funding mechanisms that helps cover the losses from events that are beyond insurable limit through a guarantee or coverage against economic losses beyond a predetermined threshold.

By establishing such a protective mechanism, these vulnerable nations could ensure a cap on potential economic damages, introducing a much-needed layer of financial predictability amidst the uncertainties of climate change. Beyond this immediate safeguard, the benefits of such an insurance and funding mechanism would extend to reinforcing their economic sovereignty. Post-disaster payouts through insurance and other protection mechanisms would ensure that the economic

Figure 30. Loss and damage caused by disasters in SIDS (1990–2021)

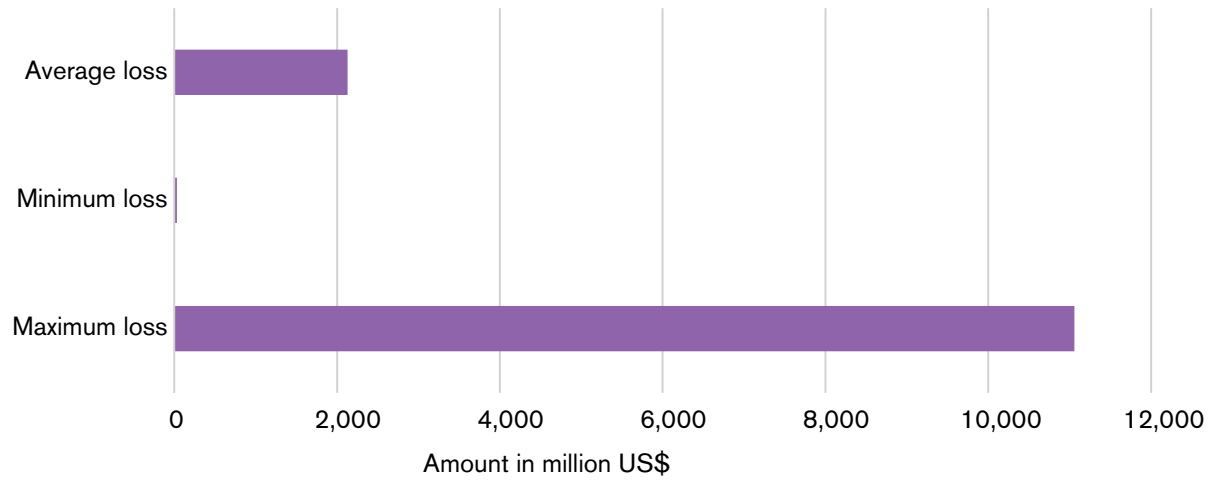
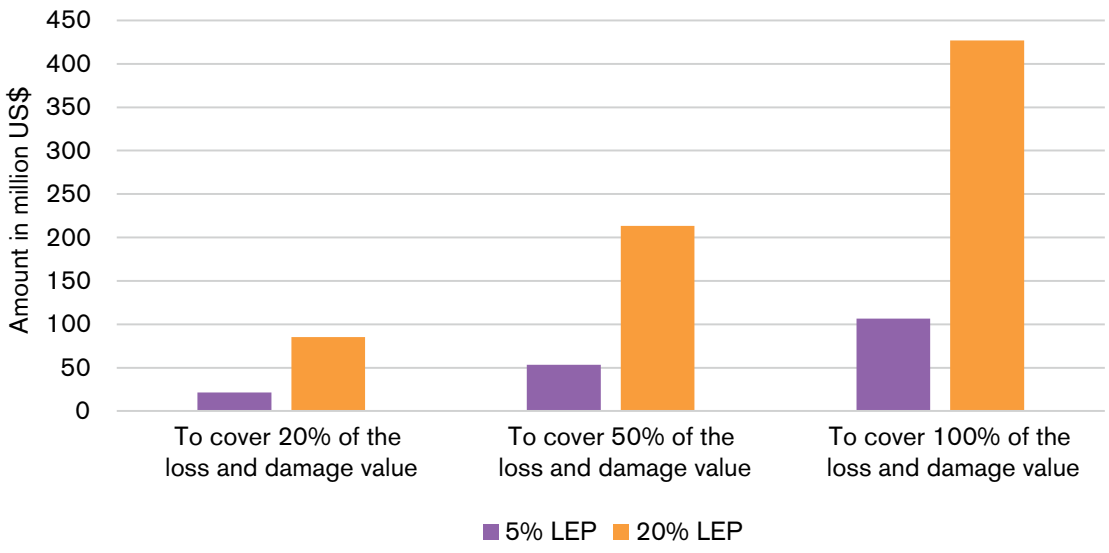


Figure 31. Cost of parametric insurance to cover the disaster losses per year in SIDS



growth of SIDS is not constrained and they are not pushed into debt to finance recovery efforts. This would not only empower them to act promptly but also diminish their reliance on external humanitarian aid or loans, minimising the risk of further indebtedness in the wake of disasters. Moreover, this protective measure would instil confidence, both for potential investors and community. It will act as a safety net to foster a sense of security and stability, crucial for future socioeconomic wellbeing of SIDS.

6.1 Mechanics of future protection

In the Figure 31 we have shown the cost of parametric insurance to cover the disaster losses per year in SIDS at 5% and 20% LEP to cover 20%, 50% and 100% of loss and damage value. This analysis is based on the loss and damage to GDP suffered by SIDS in the last 30 years.

The trade-offs between the cost of providing protection against such losses would need to be weighed carefully against the risk to growth, debt default and costs of debt restructuring that would need to be undertaken later, if such a support is not provided. Our analysis shows that the BCR of parametric insurance to cover the losses caused by disasters at 5% LEP is 2.5, and 1.09 for 20% LEP. The longer-term benefits of covering the insurance premium can far exceed the investment in premiums. Direct support to SIDS for insurance costs and other financing mechanism that covers losses beyond insurable losses can stabilise their growth, reduce poverty and allow them to invest in social protection.

6.2 Key considerations for future protection

Some of the key considerations that would be essential for ensuring effective cover for SIDS are:

Risk pooling and premium structure: By aggregating the climate-related risks of various SIDS, the initiative could distribute the potential financial burdens of climate disasters more evenly. This would mean that the occasional heavy payouts to an individual SIDS due to a catastrophic event could be balanced out by periods with minimal or no payouts. This would help make the insurance premiums affordable and cover events that are deemed as uninsurable. Over time, pooling reduces the unpredictability of insurance payouts, leading to a more sustainable and affordable system. Such a system would become crucial, especially when considering that some SIDS might experience severe impacts infrequently, but with devastating consequences when they do occur (Bharadwaj, Mitchell and Karthikeyan, 2023).

Several countries have already established insurance risk pools. In many cases, these programmes have been established to provide affordable insurance coverage for 'uninsurable' risks through private markets. In others, they promote solidarity by establishing regional risk pools to spread out the impact of losses. The Caribbean, Pacific islands and African Union, for example, have set up the Caribbean Catastrophe Risk Insurance Facility (CCRIF), the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) and the African Risk Capacity (ARC) Insurance Programme respectively (see Box 3). These regional pools provide significant advantages (Cebotari and Youssef, 2020).

BOX 3. RISK POOLING

Countries in the Caribbean, the Pacific islands and African Union have transferred their risks to three well-established regional pools that provide lower insurance premiums:

RISK-POOLING INITIATIVES	HAZARDS INSURED
CCRIF (2007)	Earthquake, tropical cyclone (hurricanes), excess rainfall, drought
PCRAFI (2013)	Tropical cyclone, earthquake/tsunami, excess rainfall
ARC (2013)	Drought, extreme weather (excess rainfall, heatwaves and tropical cyclones)

First, they provide insurance coverage at significantly lower cost than if countries had to purchase it individually. Second, they provide quick payouts following disasters, which help members maintain essential government functions. Third, the policyholders own the facility (CCRIF, PCRAFI, ARC), which allows benefits to accrue to members either through dividend payments or lower premiums.

Future protection will need a similar SIDS-wide risk-pooling approach to ensure that the premiums are affordable, and the coverage meets the requirements of the countries. By offloading some portion of risk, the insurance company will be able to reduce its overall risk and can keep premium costs lower for all of its clients (Cebotari and Youssef, 2020). As risk pools grow, the cost of operation and reinsurance in global capital markets drops, which could in turn help lower premiums. Regional pools can also facilitate access of smaller countries within SIDS to insurance and reinsurance markets by increasing the size of the aggregate portfolio, offering country-specific risk models and reducing administrative costs.

BOX 4. PARAMETRIC VERSUS TRADITIONAL INSURANCE

Parametric, or index-based, insurance, is a non-traditional insurance that provides payouts based on a trigger event. Trigger events can include environmental parameters like wind speed or rainfall measurements. Once parameters are reached, the payout is processed without the need to verify losses. In comparison, traditional indemnity insurance reimburses for the total value of the loss after an event like a flood or storm. To quantify loss, a representative from the insurance company assesses the damage.

Parametric insurance is suited to hard-to-model, low-frequency but high-intensity losses. These include catastrophic perils, weather-related risks or economic activities. They can also cover risks that lack a sufficient history of losses captured as insurance-readable data.

Payout triggers. The agility of the insurance mechanism is determined by its payout triggers. Rather than relying on post-event assessments, which can be time-consuming, indexed (see Box 4) triggers based on objective data would be more efficient to implement. For instance, if a set index like storm intensity or sea-level measurement exceeds a predetermined threshold, the payout process can be initiated automatically (Bharadwaj et al., 2023). Further nuancing the mechanism, the magnitude of the payout could vary depending on the severity of the climatic event. This will ensure that the financial support provided aligns with the scale of the disaster.

Coverage scope. Parametric insurance, while offering advantages, will only pay out after a certain level of risk is reached. This trigger might occur for several reasons. For example, the strength of a disaster might be measured in a different location from where it occurred. As a result, it might not reach the level needed to trigger the insurance. Similarly, the risk of actual losses might also exceed modelled losses. To address these issues, parametric insurance needs better location-specific and comprehensive climate risk modelling to define triggers and thresholds for insurance payouts.

The distribution of future climate impacts and their associated damages, from both slow-onset and extreme weather events in climate models, are generally shown as averages. High probability events, for example, tend to appear as a huge peak on a graph. Conversely, rare events with potentially disastrous effects appear with low probability. But even with relatively low probability, the outcomes of these rare events can be catastrophic and cause loss and damage.

Countries need insurance protection against a full range of events. To provide this, insurance products need to change how they consider climate modelling outputs.

Taking an average of different global climate models is common practice, but this produces results that may be very different from how climate impacts actually unfold. Averaging all the results obscures the range of likely impacts, and the range of less likely, more catastrophic events — the very ones that usually cause greater loss and damage — tend to get neglected.

The trigger measurement and design for insurance coverage should be fit for purpose for a range of these possible extreme weather events. The probability of these major disasters is small; but rapid — and potentially large — insurance payouts are more valuable in mitigating their effects on possible debt default and its cascading effect on growth. Similarly, the higher frequency of smaller disasters may also require coverage to help countries rebuild, because even recurring moderate events can cause significant damage. The design of the triggers will need to consider all the types of events that could have an impact on the country's fiscal performance.

Premium payment. Given the widely acknowledged fact that SIDS face a disproportionate brunt of climate change while contributing minimally to global emissions, the idea is for these premiums to be borne by international climate finance mechanisms or a dedicated global fund. Potential contributors to this fund might include established international climate funds, philanthropies or private sector entities seeking to contribute meaningfully towards global climate responsibility. The fund may need to respond to some critical questions to make such a model work at scale:

- What conditions would be attractive to insurers and reinsurers to keep premiums as low as possible?
- How can the risk pool work for a diversified portfolio of countries, given that some will be at higher risk than others and may need access to insurance support more often than others?
- What conditions would allow international climate finance to support risk-pooled debt finance at scale?
- How can the non-insurability of some events be addressed? How might reinsurance or a guarantee from the global fund work for high-severity events to limit the magnitude of potential losses for insurers?

In addition to covering premiums and guarantees for protecting the economic losses, the global fund could support longer-term adaptation and resilience building in SIDS. This would support risk reduction and thereby help reduce the magnitude of future losses and bring down the cost of premiums in the long run.

Comprehensive risk modelling and data analytics. The global fund would also need to play a leading role in developing risk analytics and modelling tools. What risks should insurance cover? What is the likely frequency and size of losses that will need to be covered? This assessment will help in pricing, the design of the trigger thresholds and structuring the provision of adequate insurance coverage. Improved measurement will also help lower insurance costs.

Catastrophe risk modelling, developed by the insurance industry, uses data on parameters that describe the magnitude, frequency and geographic distribution of potential losses. This enables insurers to price and structure coverage correctly. The development, calibration and use of such models require multidisciplinary technical expertise and experience of interpretating of model output. However, the input data for such models are often unavailable or incomplete (UNISDR, 2017). Incomplete knowledge of hazard events and their impact means more uncertainty for insurance pricing. To address these needs and reduce uncertainties, the global fund would need to invest in collecting and modelling hazard, exposure and vulnerability data. This would support the design of appropriate trigger mechanisms and avoid basis risks. In the context of insurance, basis risk occurs when there's a mismatch between the payout from an insurance product and the actual loss suffered. For example, in weather index-based insurance, a payout might be triggered when rainfall drops below a certain level in a particular region. However, if that region experiences a loss due to a localised weather event that doesn't affect the entire region, the index might not trigger a payout. Conversely, the index might trigger a payout even if the region hasn't suffered a loss. Both scenarios create basis risk. In the context of climate change and weather-related risks, basis risk can be a significant concern, especially when implementing large-scale insurance schemes that must account for highly localised and variable climate phenomena.

The data collection and models could be developed in collaboration with national meteorological and climate modelling experts. These could include academics; national meteorological, hydrological and geological services; and other government and nongovernmental agencies that collect and maintain sectoral data, such as the national bureau of statistics. The process could build capacity to promote sustainable maintenance of the risk data. Further, engaging in-country stakeholders would ensure that SIDS government needs and requirements are considered in the design of the triggers and thresholds. Stakeholders can also ensure that development of in-country technical and operational capacities for data collection and risk analytics supports the design of triggers and insurance coverage. Finally, an inclusive approach will help ensure transparency regarding the source and analysis of risk parameters.

Establish collaboration between multiple stakeholders. Collective buy-in would be crucial to make such a global fund work. Key partners, and their roles, could include:

(i) Participating SIDS governments, and their relevant finance and environment ministries, their role being to highlight their needs and requirements for debt relief and how to structure the debt relief to support adequate time for recovery from disasters

(ii) Major public and private sector creditors, Paris Club creditors, the IMF, the World Bank and other international and regional development banks, their role being to provide funding support and design the structure and modality for retrofitting insurance with existing debts or imbedding it with those planned in future

(iii) The insurance and reinsurance industries, their role being to help co-design the insurance product and risk-pooling arrangements to provide optimum coverage of risks

(iv) National technical agencies, data providers and the risk modelling community, their role being to support availability of data and more accurate risk modelling

(v) Academia, centres of excellence and nongovernmental organisations (NGOs), with a role to bring in a local/grassroots perspectives to understand the needs, vulnerabilities and priorities of local communities and incorporate them in the design of insurance cover.

By weaving together these mechanisms, the SIDS 'future protection' could emerge as not just a financial safety net but a model for solidarity and shared responsibility in the era of climate change.

7

Longer-term resilience investments

For SIDS, the challenge of climate adaptation and resilience is existential and is exacerbated by the need to manage economic and natural disaster shocks. Over 10% of the population of many SIDS will be threatened by chronic coastal flooding or permanent inundation by 2100, displacing close to 40 million people. Kiribati and Tuvalu are at risk of disappearing by the end of this century, due to rising sea levels. This is a real threat and land has been purchased on Fiji's Vanua Levu Island to accommodate future climate-induced migration from Kiribati (UNCTAD, 2022). The majority of Pacific SIDS will need to relocate some communities within the next two decades. The food security of SIDS is also under threat: for example, fish provides up to 90% of dietary protein in some Island States, but fish biomass is projected to decline by up to 25% by 2100 due to overfishing and climate change (UNCTAD, 2022).

In theory, resilient infrastructure, proactive adaptation through nature-based solutions and community-level resilience should enable SIDS to deal with some of these impacts. However, resourcing for such strategies is low due to the debt crisis, which reduces their capacity to manage immediate crises and resilience needs, let alone achieve long-term adaptation.

7.1 Why resilience bonds?

Resilience and green bonds (See Box 5) offer transformative potential to help SIDS overcome this challenge, if properly designed and executed. At their core, these bonds offer direct financing for initiatives aimed at bolstering resilience to climate-induced impacts. This ranges from funding the establishment of robust infrastructure, such as storm-resistant housing and sea walls, to backing sustainable endeavours like renewable energy projects, reforestation efforts or biodiversity conservation. These projects can help SIDS manage immediate impacts of climate change and also pave the way for sustainable economic growth.

From an investment perspective, introducing these bonds would diversify the financing toolkit available to SIDS, offering an alternative to traditional loans or aid. This can alleviate some pressure from their already-strained budgets.

7.2 Key consideration for resilience bonds

Strategic planning and project viability. Any resilience or green bond initiative for SIDS, will need a robust strategic plan anchored in clear objectives. This would involve ensuring that bond proceeds are earmarked exclusively for genuine resilience building or environmentally friendly projects. Feasibility studies might need to precede any bond issuance, providing a breakdown of project viability, associated costs, timelines and anticipated outcomes. Given the unique vulnerabilities of SIDS to climate change, a comprehensive risk assessment might be crucial. This would entail an in-depth analysis of potential hazards, vulnerabilities and impacts, offering a blueprint for structuring the bond to address the identified challenges.

Transparency, accountability and certification. Transparency and accountability are the bedrocks of any bond's success. Investors need assurance that their capital is being utilised ethically and effectively. To ensure this, mechanisms that facilitate regular reporting, third-party audits and ongoing monitoring of bond proceeds, would be required. Additionally, acquiring certifications from reputable entities can bolster investor

BOX 5. WHAT IS A RESILIENCE BOND?

A resilience bond is like a special type of loan given to a country or organisation, specifically for projects that help them better handle and recover from disasters, especially those caused by climate change. For example, to build stronger houses along the coastline that can withstand storms, or to develop farming methods that can cope with changing weather. The idea is to ensure that communities are better prepared for challenges and can bounce back more quickly after they experience them. Those who buy these bonds are essentially lending money for these projects. In return, they get their money back with some interest after a set period.

The money for the resilience bond is returned to the investors with interest through what is known as bond 'redemption'. The money to pay back the bondholders – both the principal and the interest – typically comes from:

- Revenues generated from projects: The projects or initiatives funded by the bond might generate income. For instance, if the bond funds the construction of a resilient infrastructure project like a toll bridge, the tolls collected could be a source of revenue.
- Budgetary allocations: Governments might allocate a portion of their budget for bond repayments. This would especially be the case if the bond doesn't directly fund income-generating projects.
- Refinancing: At times, the issuer might take a new loan or issue a new bond to repay an existing one. It would be like replacing an old debt with a new one, often with better terms or interest rates.
- Savings from reduced disaster impacts: Since the bond funds projects that reduce the impacts of disasters, the savings accrued (such as less money spent on disaster recovery) can also be a source for repayments.

confidence, providing a seal of approval that the bond will genuinely contribute to environmental betterment or resilience. Engaging a broad spectrum of stakeholders, from grassroots communities to international organisations, can further enrich this process. Their insights and expertise would ensure that the bond issuance and its subsequent utilisation align seamlessly with ground-level necessities. Also, engaging community in crowdsourcing data on monitoring the verification of the impacts of the project would increase accountability and reduce the cost of monitoring.

Legal and financial frameworks. Creating a conducive legal and regulatory environment will be essential. This would need to be tailored to facilitate the issuance of bonds while safeguarding SIDS' and investors' interests. Considering the intricacies of global finance, challenges tied to currency denomination and exchange rate fluctuations might also need to be addressed upfront. These issues can significantly influence the bond's appeal to both domestic and foreign investors. Furthermore, bond pricing and bond duration would need to strike a balance, making it attractive for investors and feasible for issuers in the context of investment needs.

Capacity building and market engagement. The global bond market is intricate, and for SIDS, there would be a need for a steep learning curve. Capacity-building initiatives can empower SIDS and deepen their understanding of market dynamics, financial nuances and the effective management of bond proceeds. At the same time, there would be a need for proactive market engagement. Raising awareness among potential investors about the particular challenges faced by SIDS and the multifaceted benefits of these bonds could help drive demand and foster a larger investor base.

Post-issuance management and utilisation. Issuing a bond is only half the journey: the real challenge lies in post-issuance management. Efficient utilisation of funds, channelling them into designated projects, is a task that requires proper oversight. A rigorous project management approach, complemented by regular evaluations and progress reports, could ensure that SIDS are able to report on tangible development and resilience-building outcomes.

By addressing these requirements, SIDS can harness the potential of resilience or green bonds, generating substantial funds for investment in longer-term resilience building.

8

Legal and advisor support

In the rapidly evolving global finance landscape, SIDS may find themselves at the intersection of vulnerability and opportunity. Many SIDS have limited capacity when it comes to navigating the intricate world of debt restructuring, credit agency negotiations and the broader financial ecosystem, which puts them in a disadvantageous position. The intricacies of international finance and debt negotiations, compounded by the nuanced economic and environmental challenges facing SIDS, often tilt the balance against them, resulting in less favourable terms or missed opportunities.

Increasingly, SIDS are also engaging with private creditors, who now hold a significant portion of SIDS debt. Private creditors often employ intricate loan agreements, drafted by seasoned financial experts, which may contain terms that are not immediately clear or favourable to the nations involved. For many SIDS, the fine print and long-term implications of such contracts are hard to decipher, given their limited expertise in this field.

Given the huge disparity in negotiation power and expertise between SIDS and large financial entities or private creditors, there is a pressing need for a dedicated facility. We are proposing the creation of a '**SIDS global debt and investment platform'**, to help SIDS deal with these challenges.

8.1. How can a SIDS global debt and investment platform help?

The proposed platform could provide structured support to all SIDS, providing assistance with debt contract/deal management and investment deal teams, supplementing local capacity and strengthening data, technical capacity and navigating political negotiations. The platform can provide advisory support and legal aid to negotiate the terms of future debt, restructuring of existing debt or debt alleviation efforts, negotiations on credit ratings and terms of debt, and support in designing the terms of resilience bonds and insurance products. More specifically the platform could help in:

Addressing debt and climate impact intersectionality. The vulnerability of SIDS to climate impacts may be perceived as high economic risks by creditors and they may accordingly reduce their credit scores. This can increase the cost of borrowing for SIDS. Some SIDS might have the expertise for negotiations with creditors to ensure they are not unduly penalised with poor rating due to climate risk exposure, but others may need support. This platform could offer advice, ensuring SIDS can secure favourable lending terms or debt relief agreements. It can also create a comprehensive database of all SIDS, that can support data analytics, bringing in geopolitical insights, and technical expertise to craft comprehensive strategies that resonate with the diversified challenges and the need for investment in resilience.

Examining credit rating nuances. Credit ratings dictate borrowing costs and have a huge impact on country debt challenges. The impacts of climate change and other risks on credit rating can be challenging to grasp. A dedicated advisory platform for SIDS could play a pivotal role in serving as a bridge between SIDS and credit rating agencies, ensuring that the rating methodologies holistically capture the particular challenges facing SIDS countries, instead of applying generic criteria that might overlook nuances.

Harnessing resilience bonds and insurance markets. The financing avenues of resilience bonds and insurance products, though beneficial, can be laden with complexities, such as the pricing of the products/premiums and risk assessment. The platform could provide comprehensive guidance on leveraging these financial instruments, tailored to the particular requirements of SIDS.

Capacity building. The platform can support gradual capacity building for SIDS by enabling knowledge transfer, upskilling government negotiators, local legal teams, NGOs and advocacy organisations on topics such as debt management investment negotiations, thereby fostering a self-reliant, sustainable ecosystem of expertise with in SIDS.

Leveraging collective political strength. By unifying the collective interests of all SIDS, the platform could offer a consolidated voice and strategy in international negotiations, securing terms that truly resonate with SIDS' needs and aspirations.

Such a platform would not only bridge the capacity gap but also ensure that the interests of SIDS are robustly represented, and their challenges and aspirations are effectively addressed in financial negotiations. This dedicated help could ensure they fully understand, evaluate and negotiate these agreements in a way that safeguards their interests both now and in the future.

9

The way forward

Characterised by limited resources, geographical isolation and a heightened susceptibility to climate impacts, SIDS find themselves bearing the heavy burden of climate change, despite contributing little to it. Climate impacts are pushing SIDS into vicious cycles of debt, due to repeated economic, development and infrastructure damage caused by more intense and frequent climate events.

As the effects of climate change escalate, the capacity of SIDS to counteract these impacts is diminishing proportionally with their increasing financial burdens. Each dollar channelled into debt repayment limits potential investments in climate resilience and adaptation. Consequently, every climate setback does not only signify immediate damage, it further erodes countries' future resilience capacity, deepening their financial challenges. To navigate this intricate conundrum, we have set out four strategies aimed at guiding SIDS towards sustainable debt management, an issue which needs to be addressed comprehensively.

Debt alleviation undoubtedly brings much-needed financial relief to these nations, facilitating more effective resource allocation. However, this is only one component of the solution needed to address the multi-faceted debt challenge. Addressing individual challenges can alleviate specific pressures, but a holistic, sustainable solution necessitates support across all four identified areas.

The increasing manifestations of accelerating climate change underscore the importance of establishing future protection mechanisms now. By setting such measures in place, SIDS can be better equipped to weather potential economic or environmental crises. Investments in longer-term resilience are paramount, with an emphasis on initiatives that bolster nations' inherent ability to withstand and recover from external disturbances such as climate change and economic shocks. Yet, as they navigate the complex corridors of international treaties and contracts, SIDS can benefit immensely from tailored legal aid and advisory services. Such support will ensure they are well-prepared to negotiate agreements that serve their best interests.

It is crucial to recognise that for this holistic and sustainable solution to take shape, international cooperation and commitment will be needed. Institutions such as the World Bank, the IMF and the Asian Development Bank, along with developed countries and philanthropic entities, must rally to pledge their support. This not only involves addressing the four key areas, but also includes the provision of climate finance, concessional finance and grants under the principles of climate justice and solidarity.

The challenges faced by SIDS highlight the importance of creating a united approach and shared responsibility. This should be seen as a collective endeavour to ensure that these states have the means to protect themselves from grave threats to their survival.

References

Aboneaaj, R, Estes, J and Landers, C (2022) The ABCs of Sovereign Debt Relief Center for Global Development. www.cgdev.org/publication/abcs-sovereign-debt-relief

Assa, J and Meddeb, R (2021) Towards a Multidimensional Vulnerability Index. DOI: 10.13140/RG.2.2.17634.45763

Bharadwaj, R, Mitchell, T and Karthikeyan, N (2023) Protecting against sovereign debt defaults under growing climate impacts: role for parametric insurance. www.iied.org/21426iied

Buhr, B, Volz, U, Donovan, C, Kling, G, Lo, Y, Murinde, V and Pullin, N (2018) Climate Change and the Cost of Capital in Developing Countries. Imperial College London, SOAS University of London and UN Environment. https://eprints.soas.ac.uk/26038/

Cebotari, A and Youssef, K (2020) Natural Disaster Insurance for Sovereigns: Issues, Challenges and Optimality. IMF. www.imf.org/-/media/Files/Publications/WP/2020/English/wpiea2020003-print-pdf.ashx

Centre for Research on the Epidemiology of Disasters (n.d.) EM-DAT The International Disaster Database.

Chocolate Class (2 May 2019) São Tomé & Príncipe: Back to its Roots, But Shifting its Focus. https://chocolateclass.wordpress.com/2019/05/02/sao-tome-principe-back-to-its-roots-but-shifting-its-focus/

FCDO (2023) UK–Small Island Developing States (SIDS) development partnership summary, July 2023. www.gov.uk/government/publications/uk-small-island-developing-states-sids-development-partnership-summary/uk-small-island-developing-states-sids-development-partnership-summary-july-2023

Fordelone, T, Tortora, P and Xia, J (2022) Recovering from COVID-19: How to enhance domestic revenue mobilisation in small island developing states. www.oecd.org/coronavirus/policy-responses/recovering-from-covid-19-how-to-enhance-domestic-revenue-mobilisation-in-small-island-developing-states-45f29680/

Fresnillo, I and Crotti, I (15 December 2022) Small Island Developing States drowning in debt and climate emergencies. www.eurodad.org/small_island_developing_states_drowning_in_debt_and_climate_emergencies

Global Center on Adaptation (n.d.) What are resilience bonds and how can they protect us against climate crises? https://gca.org/what-are-resilience-bonds-and-how-can-they-protect-us-against-climate-crises/#:~:text=Bonds%20are%20used%20by%20companies,specifically%20for%20climate%20resilient%20investment

Greenidge, K, Craigwell, R, Thomas, C and Drakes, L (2012) Threshold Effects of Sovereign Debt: Evidence from the Caribbean. DOI: 10.5089/9781475504507.001

Humphreys (2022) Exceedance Probability in Catastrophe Modeling. www.casact.org/sites/default/files/2021-03/02_humphreys.pdf

IIED (n.d.) Tackling the debt, climate and nature crises together. www.iied.org/tackling-debt-climate-nature-crises-together

IMF (2019) Heavily Indebted Poor Countries (HIPC) Initiative and Multilateral Debt Relief Initiative (MDRI)—Statistical Update. IMF Policy Paper No. 2019/028. www.imf.org/en/Publications/Policy-Papers/Issues/2019/08/06/Heavily-Indebted-Poor-Countries-HIPC-Initiative-and-Multilateral-Debt-Relief-Initiative-MDRI-48566

IMF (2023) Debt relief under the heavily indebted poor countries (HIPC) initiative. www.imf.org/en/About/Factsheets/Sheets/2023/Debt-relief-under-the-heavily-indebted-poor-countries-initiative-HIPC#:~:text=Debt%20Relief%20Under%20the%20Heavily%20Indebted%20Poor%20Countries%20(HIPC)%20Initiative,faces%20an%20unmanageable%20debt%20

IMF (n.d.a) Global Debt Database. www.imf.org/external/datamapper/datasets/GDD

IMF (n.d.b) Questions and Answers on Sovereign Debt Issues. www.imf.org/en/About/FAQ/sovereign-debt

IPCC (2023) Climate Change 2023: Synthesis Report. A Report of the Intergovernmental Panel on Climate Change. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC. www.ipcc.ch/report/ar6/syr/

Italian Ministry of Economy and Finance (n.d.) The Common Framework for debt treatment beyond the DSSI. www.mef.gov.it/en/G20-Italy/common-framework.html

Jones, T (22 January 2022) Growing global debt crisis to worsen with interest rate rises. https://debtjustice.org.uk/press-release/growing-debt-crisis-to-worsen-with-interest-rate-rises

Kalyan, K and Yihong, L (2022) The State of Climate Ambition. The Least Developed Countries (LDCs) Snapshot. www.undp.org/sites/g/files/zskgke326/files/2023-01/UNDP_The_State_of_Climate_Ambition_LDCs_Shapshot.pdf

Kose, MA, Kurlat, S, Ohnsorge, F and Sugawara, N (2022) A Cross-Country Database of Fiscal Space. *Journal of International Money and Finance* 128, 102682. DOI: 10.1016/j.jimonfin.2022.102682

Mohaddes, K, Kraemer, M, Burke, M, Klusak, P and Agarwala, M (25 March 2021) Rising temperatures, melting ratings. VoxEU/CPPR. https://voxeu.org/article/rising-temperatures-melting-ratings

Mustapha, S, Talbot, T and Gascoigne, J (2023) Innovations in Sovereign Debt: Taking Debt Pause Clauses to Scale https://static1.squarespace.com/static/61542ee0a87a394f7bc17b3a/t/643506609e2df202d2974606/1681196642102/230406_Innovations+in+Sovereign+Debt+Taking+Pause+Clauses+to+Scale_FINAL+%281%29.pdf

OECD (2022) Aggregate trends of climate finance provided and mobilised by developed countries in 2013–2020. www.oecd.org/climate-change/finance-usd-100-billion-goal.

OECD (2018) Characteristics and vulnerabilities of small island developing states. In: *Making Development Co-operation Work for Small Island Developing States* Ch 1. https://doi.org/10.1787/9789264287648-en

Searchlight (2 September 2011) SVG 'green gold' floored by again Black Sigatoka. www.searchlight.vc/front-page/2011/09/02/svg-green-gold-floored-by-again-black-sigatoka/

Thomas, A and Theokritoff, E (2021) Debt-for-climate swaps for small islands. *Nature Climate Change* 11, 889–891. DOI: 10.1038/s41558-021-01194-4

UN (n.d.) About Small Island Developing States. www.un.org/ohrlls/content/about-small-island-developing-states

UN-OHRLLS (n.d.) Financing for Small Island Developing States. Advance unedited copy. www.un.org/ohrlls/sites/www.un.org.ohrlls/files/financing_for_development_for_sids_report_advance_unedited.pdf

UNCTAD (2022) Revisiting development strategies for small island developing States in the post-pandemic competitive landscape UNCTAD Secretariat. https://unctad.org/system/files/official-document/ciiem6d2_en.pdf

UNISDR (2017) Developing Risk Assessment to Support Sovereign Risk Financing and Risk Transfer. www.undrr.org/publication/developing-risk-assessment-support-sovereign-risk-financing-and-risk-transfer

World Bank (n.d.a) Data. GDP (current US$). https://data.worldbank.org/indicator/NY.GDP.MKTP.CD

World Bank (n.d.b) International Debt Statistics (IDS). www.worldbank.org/en/programs/debt-statistics/ids

World Meteorological Organisation (22 May 2023) Economic costs of weather-related disasters soars but early warnings save lives. Press release. https://public.wmo.int/en/media/press-release/economic-costs-of-weather-related-disasters-soars-early-warnings-save-lives

Small Island Developing States (SIDS) are getting entrapped in financial quagmire due to climate impacts. This paper delves into the urgent financial plight of SIDS, examining the multifaceted challenges they face across social, environmental and economic domains. It argues for a comprehensive approach to debt relief, future protection, resilience investment and advisory support as necessary steps for the survival and sustainable development in these vulnerable regions.

IIED is a policy and action research organisation. We promote sustainable development to improve livelihoods and protect the environments on which these livelihoods are built. We specialise in linking local priorities to global challenges. IIED is based in London and works in Africa, Asia, Latin America, the Middle East and the Pacific, with some of the world's most vulnerable people. We work with them to strengthen their voice in the decision-making arenas that affect them — from village councils to international conventions.

iied

International Institute for Environment and Development
Third Floor, 235 High Holborn, London WC1V 7DN, UK
Tel: +44 (0)20 3463 7399
Fax: +44 (0)20 3514 9055
www.iied.org

Knowledge Products

Funded by:

Climate Emergency Collaboration Group and our frame funders Irish Aid and Swedish International Development Cooperation Agency (Sida)