POLICY BRIEF

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Climate Resilience in Small Island States: Realizing the Major Macroeconomic Benefits from Adaptation Investments

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ABSTRACT

Our recent research on the state and trends of climate adaptation finance needs in Small Island Developing States (SIDS) highlights that the total cost of adaptation for all SIDS is very small in the global context but very large for individual island nations.[1] The research highlights how exceeding the 1.5°C warming level will have catastrophic consequences for SIDS. In this policy brief, we review the large and increasing climate risks faced by island nations, the urgent need to close the financing gap, and the potential of the blue economy. We then offer recommendations for increasing resilience across all sectors in SIDS.

WHY FOCUS ON SMALL ISLAND STATES?

Previous reports in the State and Trends in Adaptation series from the Global Center of Adaptation (GCA) have focused on Africa, describing in detail the challenges countries face because of climate change. Our latest report expands GCA's deep analysis to a group of nations that typically gets less attention from the global climate change and adaptation communities – small island developing states (SIDS).

[1] Global Center on Adaptation. 2025. State and Trends in Adaptation Report 2025: Small Island Developing States. Rotterdam. https://gca.org/reports/sta25/

KEY MESSAGES:

1. **Small Island Developing States (SIDS) are increasingly affected by the growing impacts of climate hazards,** including tropical cyclones, storm surges, increases in temperature, heatwaves, droughts, coastal and riverine flooding, changing precipitation patterns, and sea level rise, among others.
2. **Disasters cost SIDS approximately 18% of their gross domestic product (GDP) on average,** significantly higher than the world average of around 3%.
3. **Annually, economic losses of $1.7 billion on average can be attributed to climate change in SIDS** (from 2000 to 2022). This constitutes 0.8% of the collective GDP of SIDS.
4. **A dollar invested in adaptation can generate an economic return of as much as 6.5 dollars** in avoided damages and new growth opportunities in SIDS.
5. **International adaptation finance flows to SIDS are only 0.2% of global climate finance and must grow six-fold to meet assessed needs.** The 39 SIDS nations are among the most vulnerable to climate change impacts and received just over $2 billion annually on average in international public climate finance for adaptation in 2021–2022.
6. **The adaptation finance needs of SIDS are not large in the global context and can be met with sufficient international political will and action.** The $12 billion in annual finance need is very large for SIDS economies but represents only 1.2% of all global climate finance and 4% of all global Overseas Development Assistance (ODA).

The 39 small island developing states (SIDS) are enormously diverse. Home to 65 million people, they are found in the Caribbean; the Pacific; and the African, Indian Ocean, and South China Sea. Some are comprised of low-lying islands, formed by coral atolls that rise above the ocean waves. Others contain towering peaks. These nations are biologically rich and varied, harboring 40 percent of the world's vital coral reef ecosystems and 20 percent of the total global biodiversity. Most of the funding for adaptation presently comes from the public sector. To tap a wide range of potential actors,it is necessary to build the enabling environment foradaptation investment and aggressively deploy innovative finance instruments at scale towards adaptation activities.

A total of 10,113 deaths associated with climate-related events were recorded in SIDS, of which an estimated 38% are attributable to climate change (a total of 3,806 deaths) (Figure 1). Nearly 20 million of the 46.6 million total numbers affected by extreme weather from 2000 to 2022 can be attributed to climate change. Climate change is responsible for 39% ($41.3 billion) of total economic losses[1] recorded (Figure 2), of which 65% are due to loss of life, measured as statistical loss of life (SLOL).

SIDS face many challenges. The most urgent is their extreme vulnerability to the consequences of climate change. Their collective greenhouse gas emissions add up to less than 1 percent of the global total, yet they are disproportionally likely to suffer from its impacts. Rising seas threaten to submerge communities in the Maldives and Marshall Islands, while increasingly powerful storms are taking an enormous human and economic toll, destroying or damaging ports, roads, hotels, airports, and other critical infrastructure from Tuvalu to Grenada. In 2017, tropical cyclone Maria caused extensive damage and destroyed most of the infrastructure in Dominica, for example, causing estimated damages of nearly US$1 billion, 226 percent of the nation's annual GDP with additional losses of US$380 million.[2]

Our analysis reveals that without immediate steps to build resilience and adapt to the impacts of climate change, the total damages across SIDS could climb to as much as US$476 billion by 2050, creating a huge drag on economic development, reversing years if not decades of economic progress in these nations.[3]

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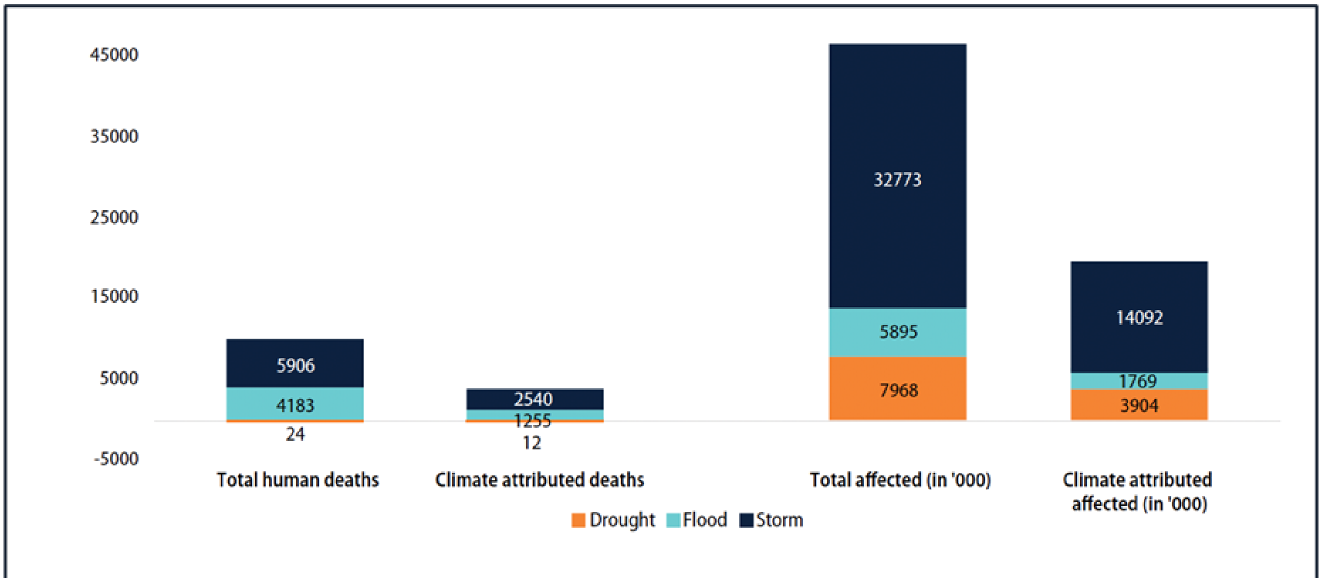
Figure 1. Climate-attributable Mortality and Number of People Affected in SIDS (2000–2022)



Note: Analysis is based on the disaster damage records of EM-DAT, using regional average FARs. Analysis includes 37 of the 39 UN Member SIDS, excluding Singapore and Nauru. All figures are in 2020 US$.

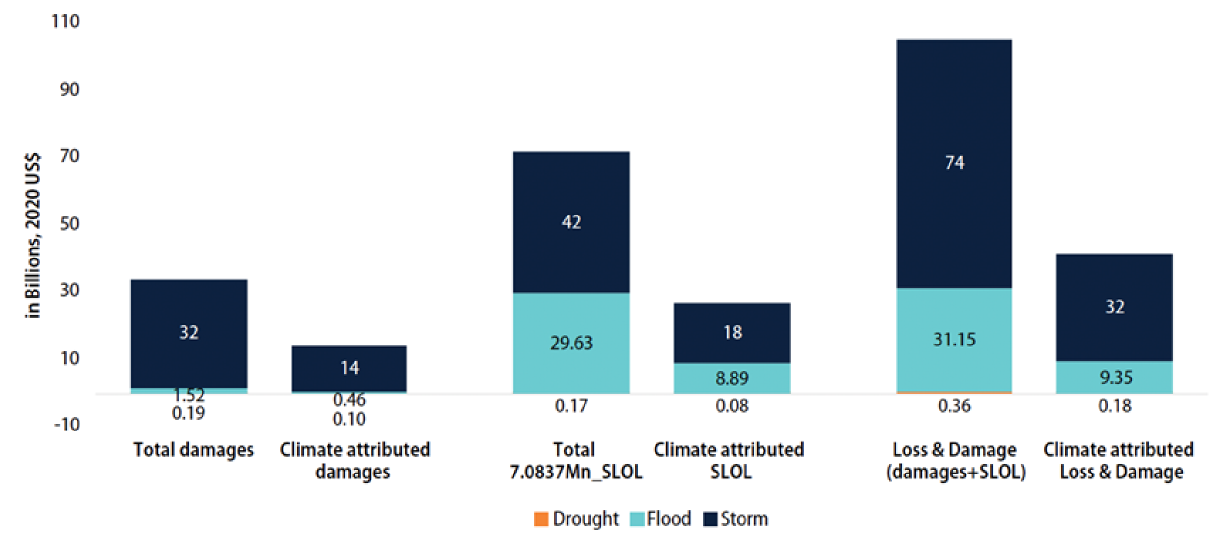
Source: Panwar et al. (2023a) The Costs of Inaction: Calculating climate change-related loss and damage from extreme weather in Small Island Developing States'.

[1] Total economic loss and damage includes both recorded damages from EM-DAT and SLOL.

[2] https://hlpf.un.org/sites/default/files/vnrs/2022/VNR%202022%20Dominica%20Report.pdf

[3] GCA 2025.Op.cit.

Figure 2. Climate-attributable Loss and Damage (economic losses) in SIDS (2000–2022)



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Source: Panwar et al. (2023a) The Costs of Inaction: Calculating climate change-related loss and damage from extreme weather in Small Island Developing States'.

INCREASING FINANCE FOR ADAPTATION

To quantify the level of investment in adaptation measures needed to reduce climate risks in the SIDS and to estimate the resulting benefits, our report undertook a rigorous macroeconomic analysis of six representative island states: the Comoros, Maldives, and Mauritius in the Indian Ocean; Fiji and the Marshall Islands in the Pacific; and Barbados in the Caribbean. The analysis used a Green Economy Model (GEM) and reliable, comprehensive, open-source databases to calculate costs and benefits under different climate scenarios and socioeconomic pathways.

SIDS are particularly vulnerable to climate impacts, not just because of their geographic locations, but also because their economies are highly dependent on tourism and trade. A severe storm that destroys or damages such critical infrastructure and assets as ports, hotels, and pristine beaches can therefore cripple economies for months or years after the event. Even if the world limits the global temperature rise to 1.5°C, the GDA modelling shows that SIDS will suffer climate-related losses of more than US$200 billion by 2050.

Using a bottom-up approach to calculate adaptation needs and benefits, the modeling shows that an investment of between US$54 billion and US$127 billion will cut climate damage as a share of GDP for these countries by more than 50 percent. Even using a discount rate of 10 percent, the benefit-to-cost ratio is surprisingly high – 6.5 for the Maldives and 5.6 for Barbados.

Overall, the benefits are 3.53 to 15.73 times larger than the costs, depending on the climate scenario and specific adaptation investment. Constructing or retrofitting roads and buildings to withstand fiercer storms is expensive, for example, with a lower return on investment. In contrast, expanding renewable energy, such as with distributed solar photovoltaic generation, is particularly cost effective because of the multiple benefits it provides. In addition to improving climate resilience, renewable energy replaces expensive fossil fuel imports and cuts energy spending, slashes air pollution and greenhouse gas emissions, and improves health. Similarly, resilience measures that improve economic and labor productivity, such as climate-smart agriculture and air-conditioned workplaces, also have high returns.

THE CHALLENGES OF CLOSING THE FINANCE GAP

Existing frameworks for climate and development finance are falling far short of the need in these highly vulnerable countries. The 39 SIDS are receiving just over US$2 billion annually in international public climate finance, with 67 percent going to just 10 countries. The amount needs to be increased at least six-fold to US$12 billion and spread more widely among all the countries, based on SIDS' own estimates.[4]

Substantial barriers stand in the way of providing this urgently needed support. Many climate finance mechanisms are not

[4] GCA 2025 op.cit.

designed with SIDS in mind, nor do they consider the unique situations and needs of the island nations. In addition, many nations lack the institutional capacity to measure and report physical climate risks, to track adaptation financing, and to transparently report that financing. Further constraints include the long distances between island nations and major global markets, which hamper trade; high finance transition costs; and the lack of historical climate data.

KEY SECTORS AND OPPORTUNITIES

The Blue Economy

Small island nations are renowned for their spectacular beaches, lagoons, coral reefs, mangrove forests, and other natural resources. These resources not only support some of the world's richest and most biodiverse ecosystems, but they also create a "blue economy" that is essential for the nations' economic health and future growth.

Climate change is a growing threat to this blue economy. In the Caribbean alone, island nations are projected to lose up to 3,900 km2 of land to rising seas and erosion by 2050, with estimated economic losses of US$406 billion to US$624 billion. Higher ocean temperatures and ocean acidification are bleaching coral reefs and harming highly productive coastal and marine ecosystems, threatening economically valuable fisheries. Extreme storms damage hotels and resorts, keeping tourists from visiting for months afterward.

It is necessary, therefore, for small island nations to slow and prevent coastal erosion, and to better protect tourism and fisheries, which are the two key industries for the blue economy.

Combatting Coastal Erosion

Coastal ecosystems are being threatened by sea level rise, destructive practices like poorly regulated sand mining, more powerful waves, and more extreme storms. The resulting losses are taking a huge human and economic toll. A World Bank study estimated that coastal degradation in Benin, Côte d'Ivoire, Senegal, and Togo adversely affected 1.4 million people in 2020.[5] It also causes 13,000 deaths per year, the study estimated. In a worst-case scenario, the disappearance of sandy beaches in Mauritius could cost the nation US$100 million per year by 2060 in lost tourist revenue. And in Jamacia, the loss of mangrove forests, which protect coasts from storms and waves, would increase damages to residential and industrial property by nearly 24 percent, or more than US$33 million annually, the World Bank estimates.

There is an urgent need, therefore, for island nations to first understand and monitor the extent of coastal degradation, using such tools as citizen science monitoring and geospatial analysis. Then they must work to preserve or expand existing ecosystems, such as by restoring mangroves and coastal wetlands, and revegetating dunes.

Protecting and Growing Tourism

Tourism-related revenues are central to the economic development and survival of small island nations. In 2023, tourism was responsible for 12.6 percent of their GDP, about three times higher than the average in developed economies. Extreme weather events exacerbated by climate change threaten this economic driver, causing both immediate and long-lasting effects. When Cyclone Pam hit Vanuatu in 2014, for example, the tourism sector suffered 26 percent of the total losses, and most major hotels were forced to close for three to six months to repair the damages. Moreover, storms can harm tourism even when there is no actual damage. After hurricanes Maria and Irma cut a destructive swath across one-third of Caribbean islands in 2017, the number of visitors to the remaining undamaged islands dropped by hundreds of thousands. The tourism sector is also under threat from slow-onset climate impacts, such as sea level rise, heat waves, coral bleaching, and ocean acidification.

Small island state governments can play a critical role in protecting this valuable industry by helping to enhance the resilience of resorts and other supporting infrastructure, conserving and restoring natural ecosystems, and improving disaster risk management and insurance.

Making Fisheries Sustainable

Fisheries are also essential for the economies of SIDS. They provide food, export revenue, and income, and contribute to the culture of both rural and urban communities. The total catch has grown significantly since the 1990s, peaking at nearly 2 million tons in 2019, more than half of which is tuna and tuna-like species taken from marine waters. About half of the fish are exported, with a value of about US$3 billion in 2022.

This industry is being threatened by both climate change and overfishing. Higher temperatures and ocean acidification are damaging coral reefs and other crucial habitats, for example. Under the high-emissions climate scenario (RCP8.5), fish harvests in the Pacific could drop 20 percent by 2050 and up to 50 percent by 2100. Moreover, an estimated 75 percent of Pacific Island communities dependent on coastal fisheries will be unable to meet their food security needs by 2030.

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[5] World Bank. 2019. "The Cost of Coastal Zone Degradation in West Africa." https://documents1.worldbank.org/curated/en/822421552504665834/pdf/The-Cost-of-Coastal-Zone-Degradation-in-West-Africa-Benin-Cote-dIvoire-Senegal-and-Togo.pdf

CONCLUSION: RECOMMENDATIONS TO INCREASE RESILIENCE IN SIDS

Improve Strategy, Planning, and Governance: SIDS should clearly outline their priority sectors in strategic adaptation documents, develop sector plans, calculate the financial needs for adaptation measures to help attract finance, strengthen monitoring and evaluation, and modernize national data infrastructure.

Educate and Empower Youth: There is a need to improve education and raise school enrollment rates in the small island nations to better prepare young people for a more uncertain future.

Increase Institutional Capacity: Governments need more detailed climate data, more information on areas and ecosystems at risk, stronger abilities to predict damaging events and to provide early warnings, and greater capacity to explore and procure innovative financing instruments. Regional efforts are needed to meet these challenges.

Implement Nature-based Solutions (NbS): In many cases natural resources and ecosystems can be much more cost-effective than "hard" solutions, such as levees, breakwaters, or sea walls. Nature-based Solutions include restoring mangrove forests, protecting coral reefs, maintaining or restoring wetlands and forests, and adding more green spaces to urban areas. These solutions can help support fisheries and tourism, protect freshwater supplies, increase biodiversity, reduce heat island effects, provide new recreational opportunities, and help to preserve cultural practices.

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