

2 STEPS DOWN THE DEBT SPIRAL: COVID-19 AND TROPICAL CYCLONES SEVERELY LIMIT THE FISCAL SPACE OF MANY SMALL ISLAND DEVELOPING STATES

WITH TOURISM BEING ONE OF THE SECTORS MOST AFFECTED BY COVID-19, MANY SIDS ECONOMIES FIND THEMSELVES CRITICALLY HIT BY THE PANDEMIC, ADDING TO THE CONTINUED FINANCIAL STRESS THROUGH TROPICAL CYCLONE-INDUCED LOSSES. CLIMATE MODELS PROJECT RISKS TO FURTHER AGGRAVATE.

Executive Summary

- Many Small Island Developing States (SIDS) economies are heavily dependent on tourism. For the 13 Caribbean SIDS considered here, **total contributions of tourism** to GDP amount to **28% on average**, and exceeding 40% for the most dependent countries. At the same time, tourism is one of the worst affected sectors by the pandemic, with declines in the international tourism industry expected to range between 60% and 80% in 2020 and an uncertain outlook.
- Many SIDS are particularly vulnerable to tropical cyclones. Averaging over the past 20 years, losses due to tropical cyclones amounted to **3.7% of the GDP each year** for Caribbean SIDS. For the most affected countries, average yearly losses even reached 21.2% of GDP.
- **Tropical cyclone risks** are projected to get worse with **annual damages expected to increase on average by 22%** and reaching potentially up to 40% over the next 10 years due to climate change and economic growth.
- COVID-19 and tropical cyclones add up to a **substantial financial burden for many SIDS**, severely limiting their fiscal space. Even before the pandemic hit, the **average debt to GDP ratio** reached **60% for Caribbean SIDS**. Without holistic international debt relief efforts, many public services, including continued efforts for disaster risk reduction, climate adaptation and mitigation, risk to become unachievable.

Economic vulnerability

By their very nature and topography, Small Island Developing States (SIDS) economies are highly vulnerable to external shocks: Their domestic markets are small, they are typically dependent on a limited natural resource base, exports are diversified to a very low degree only and their remoteness poses further hurdles to trade (UNCTAD, 2020 and UN General Assembly, 2019). Thus, for many SIDS tourism is an important source of income and employment. To assess the double burden many SIDS are currently shouldering due to COVID-19- and natural disaster-induced losses, this briefing paper analyses data from 13 Caribbean SIDS¹. As table 1 shows, tourism (including its indirect and induced impacts such as purchases made by the direct travel- and tourism-related sectors) contributes on average 28% to GDP. Tourism plays a particularly important role in Antigua and Barbuda, Grenada, St. Lucia and The Bahamas where the total contributions of tourism to GDP amounts to over 40%.

¹ These 13 Caribbean SIDS are Antigua and Barbuda, Barbados, Belize, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, The Bahamas, Trinidad and Tobago.

Table 1: Tourism contribution to GDP

Country	Total contribution of tourism to GDP in % (2019)
Antigua and Barbuda	42,7%
Barbados	30,9%
Belize	37,2%
Dominica	36,9%
Dominican Republic	16,3%
Grenada	40,5%
Haiti	8,4%
Jamaica	31,1%
St. Kitts and Nevis	28,2%
St. Lucia	40,7%
St. Vincent and the Grenadines	28,6%
The Bahamas	43,3%
Trinidad and Tobago	7,8%

Total contribution to GDP refers to the GDP generated directly by the Travel and Tourism sector plus its indirect and induced impacts. Source: World Travel and Tourism Council (<https://tool.wttc.org>)

impacts of the current pandemic, there are more channels through which it affects the SIDS economies. For example, remittances play an important role for many SIDS, ranging between 1 and 8% of GDP on average and reaching almost 40% of GDP in Haiti.² Global remittance flows are expected to decline by 20% in 2020 due to the global economic downturn – the strongest reduction in recent history.³ For many SIDS, the reduction in transfers might be even larger given that the majority of the remittances is sent from the US. Furthermore, the global economic downturn reduces international demand and thus adversely impacts trade flows.

At the same time, tourism is one of the sectors most affected by the pandemic. Due to the lockdown and continuing travel restrictions, the international tourism industry is expected to decline by 60% to 80% in 2020 (OECD 2020), with unclear prospects for 2021. Table 2 presents expected GDP losses due to tourism receipt shortfalls for several Caribbean SIDS. Following a recent UNCTAD report (UNCTAD, 2020), we consider three different scenarios. The optimistic scenario assumes a complete standstill of the tourism industry for 4 months, equivalent to a 75% lockdown during a bit more than 5 months. The intermediate scenario assumes an 8 months complete lockdown (equivalent to an 75% reduction in all touristic activities over almost 11 months). Finally, the dramatic scenario assumes COVID-19 related travel restrictions are going to continue well into 2021, resulting in a 12-months complete lockdown, or, equivalently, an 75% reduction in all tourism-related activities for 1 year and 4 months.

While the disruptions in tourism flows and the resulting declines in tourism receipts are probably the most directly visible economic

² <https://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS>.

³ <https://www.worldbank.org/en/news/press-release/2020/04/22/world-bank-predicts-sharpest-decline-of-remittances-in-recent-history>.

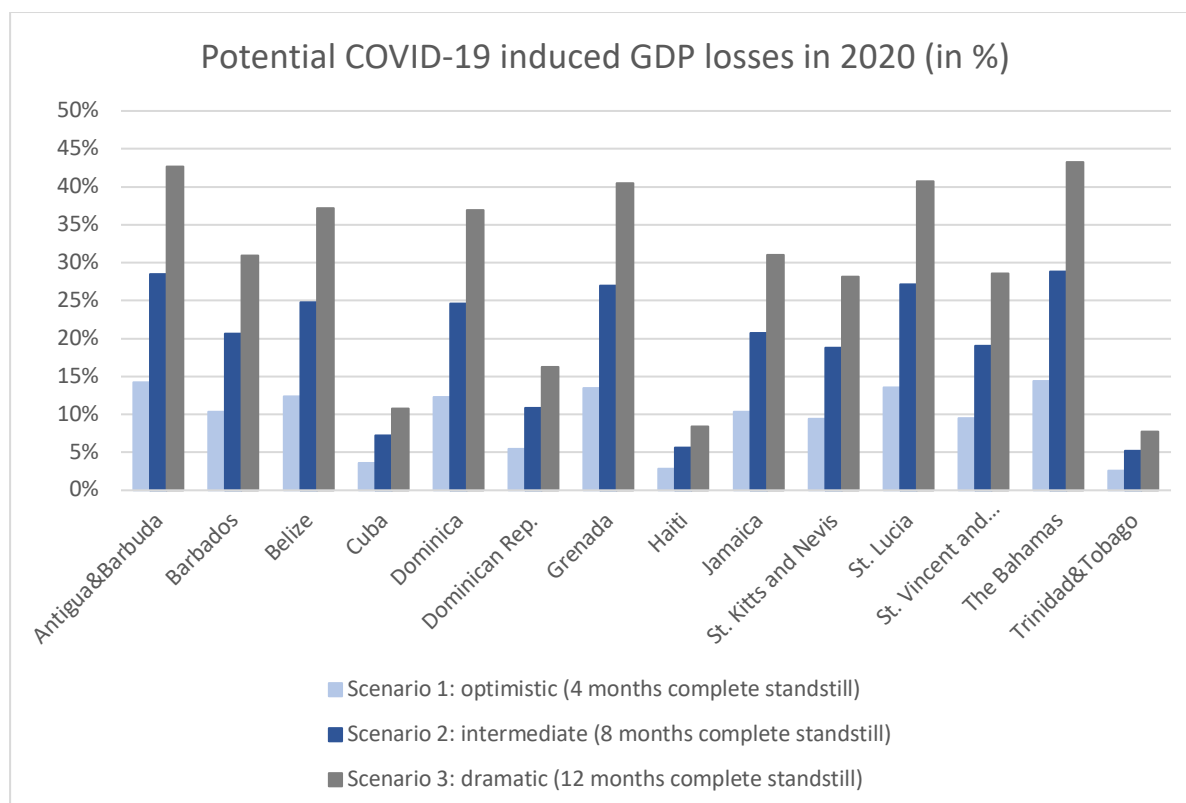


Figure 1: Expected GDP losses in 2020 due to COVID-19 induced travel restrictions. Expected GDP losses are based on the total contributions of tourism to GDP and the three different scenarios on the end of travel restrictions (based on UNCTAD, 2020). More information can be found on gitlab at <https://gitlab.com/climateanalytics/climada>.

Continued financial stress from tropical cyclones

Adding to their vulnerability to the current COVID-19 pandemic, SIDS are particularly vulnerable to natural disasters, especially the Caribbean SIDS located in the so-called hurricane alley. Tropical cyclones are dangerous and very costly extreme weather events. While the current pandemic represents an unprecedented situation, tropical cyclones occur regularly, albeit with a different frequency and magnitudes in the Caribbean Sea. Over the past 20 years, some of the Caribbean SIDS considered in this Briefing Paper were hit by a major hurricane (very intense tropical cyclone of category 4 or 5) up to 8 times (EM-DAT, 2020). As Table 2 shows, losses due to the most recent very intense tropical cyclones were substantial. In 2017, Hurricane Maria hit Dominica, Puerto Rico and Antigua and caused catastrophic devastation of the islands. Total losses amounted to over 200% of the GDP in Dominica. Shortly afterwards, it was followed by Hurricane Irma, which together with Hurricane Maria, caused losses the size of 46% of the GDP in Antigua and Barbuda.⁴ Hurricane Dorian, which made landfall just a year ago, resulted in massive damages of about 3.4 billion USD in The Bahamas, equivalent to more than a quarter of the country’s GDP (Zegarra et al., 2020). Many affected areas are yet to recover from Dorian’s impacts.

To illustrate the continuous financial burden tropical cyclones impose on many SIDS, Table 2 also presents weather-related losses averaged over the period 1998-2017. On average, countries incur costs the size of 3.7% of the GDP *each year*, with yearly average costs amounting to more than 1/5 of the GDP in Dominica.

⁴ <https://www.gfdrr.org/en/publication/hurricane-irma-and-maria-recovery-needs-assessment-antigua-and-barbuda>

Table 2: Weather-related losses.

Country	Annual average 1998-2017	Most recent major tropical cyclone	
	Losses per unit of GDP in %	Year	Losses per unit of GDP in %
Antigua and Barbuda	4.1%	2017	45.9%
Barbados	0.1%		
Belize	3.0%	2016	5.7%
Dominica	21.2%	2017	215.4%
Dominican Republic	0.3%	2017	0.3%
Grenada	7.1%	2005	15.7%
Haiti	2.6%	2016	17.7%
Jamaica	0.7%		
St. Kitts and Nevis	4.2%	2017	11.9%
St. Lucia	0.9%	2016	0.9%
St. Vincent and the Grenadines	1.2%	2016	0.2%
The Bahamas	2.1%	2019	26.5%
Trinidad and Tobago	0.0%		

Source: Eckstein et al. (2019) and Zegarra et al. (2020).

Tropical cyclone risks projected to get worse in the next decade

Tropical cyclone risks are projected to further aggravate in the future. The intensity of tropical cyclones is closely linked to sea surface temperatures and indeed, climate models project an increase in the most intense tropical cyclones with global warming (Knutson et al., 2020). Whether the frequency of tropical cyclones in the North Atlantic will change with global warming is however less certain (Bhatia et al., 2018; Knutson et al., 2020). What is more, the impacts from tropical cyclones are expected to worsen in the future: The warmer atmosphere can carry more water and thereby bring heavier precipitation (Knutson et al., 2019) and sea levels rise will cause more severe storm surges (Woodruff et al., 2013).

Results from a probabilistic natural catastrophe damage modelling exercise (CLIMADA, see box below as well as Aznar Siguan and Bresch, 2019) presented in Table 3 project annual damages from tropical cyclones to increase by between 12 and 40 percent over the next 10 years alone (column 3). These additional damages can partly be attributed to a growing non-financial asset base which translates into a higher absolute asset value that could potentially be destroyed.⁵ At the same time, column 2 of Table 3 shows that between 39 and 77% of the losses projected for the year 2030 result from an increase in tropical cyclone intensity due to climate change.

⁵ Information on the assumed growth rate as well as sensitivity analyses using different growth rates can be found on gitlab at <https://gitlab.com/climateanalytics/climada>.

Table 3: Projected future damages from tropical cyclones based on the CLIMADA damage model

Country	Increase in Expected Annual Damage between 2020-2030	Climate Change Fraction of Increase in Expected Annual Damages
Antigua and Barbuda	20%	48%
Belize	21%	50%
Dominica	18%	59%
Grenada	14%	77%
Haiti	40%	36%
Jamaica	22%	56%
St. Kitts and Nevis	30%	39%
St. Lucia	26%	43%
St. Vincent and the Grenadines	22%	53%
Median	22%	50%

Policy implications: Debt relief

The recovery from the COVID-19 pandemic is all but certain, but a comparison to previous crises with an important impact on tourism could provide some orientation. In particular, world arrivals returned to previous volumes 11 months after the SARS outbreak in 2003, 14 months after the September 11th attacks and 19 months after the economic crisis in 2008 (UNWTO, 2020). Similarly, the International Monetary Fund predicts a GDP contraction of 9.4% in Latin America and the Caribbean for 2020 while growth is expected to resume in 2021 (IMF, 2020). At the same time, research indicates tropical cyclones will continue to hit the SIDS, slowing down recovery from COVID-19 impacts and probably causing further catastrophic devastation and severe losses and thus hindering recovery of tourist arrivals to pre-COVID levels. In addition, the loss risk is projected to further aggravate, increasing by 22% over the next decade already.

Put together, COVID-19 and tropical cyclones add up to a substantial financial burden for many SIDS. This seriously impacts liquidity access and the fiscal space of these governments that also “lack the leverage to revise the terms by which we can access concessional finance or restructure debt” (AOSIS, 2020). Even before the pandemic hit, the average debt to GDP ratio reached 60% for the SIDS considered here (UN General Assembly, 2019). Many Caribbean countries pay almost 25% of their export earnings to service annual external debt obligations.⁶ In turn, the scope for building resilience, including important climate adaptation and disaster mitigation investments, reduces significantly. This double burden also threatens to undermine sustainable development gains that have been made by the region in recent years.

What is more, this year’s tropical cyclone season has just started. There is high agreement between different forecasting groups that this year’s hurricane activity will be above average⁷. COVID-19-induced financial stress threatens to limit the resources available for cyclone protection and recovery. In the midst of a pandemic, the prospect of many cyclone-affected people seeking refuge in crowded

⁶ Exact numbers for each country can be viewed here:

https://data.worldbank.org/indicator/DT.TDS.DECT.EX.ZS?end=2018&name_desc=false&start=1970&view=chart

⁷ Forecasts from different entities can be accessed and compared here:

<https://seasonalhurricanepredictions.bsc.es/predictions>.

shelters combined with strained medical services in a post-hurricane situation is worrisome for many governments in the region.

This briefing paper therefore echoes calls for coordinated international debt relief efforts. Depending on the specific needs of each country, these could take the form of debt forgiveness, suspension of debt servicing, debt swaps or debt restructuring and could be combined with to-be-developed innovative financing mechanisms. While the IMF approved debt relief for 25 countries already in April (IMF, 2020b), of which three SIDS (Haiti, Sao Tomé and Príncipe, Solomon Islands), more needs to be done. Several researchers suggest a debt standstill for developing countries as a response to the current pandemic (Bolton et al., 2020).

Furthermore, the Economic Commission for Latin America and the Caribbean (ECLAC) acknowledged already in 2015 that for many Caribbean countries, the debt burden as well as the growth prospects are strongly intertwined with climate-related natural disasters. ECLAC, working together with highly indebted countries in the Caribbean, have therefore jointly developed a *debt for climate adaptation swap* to reduce the countries' debt burden and at the same time help achieve the Sustainable Development Goals.⁸ Achieving sustainable and climate-resilient development as outlined in the SAMOA pathway will be costly for many SIDS, as the UN Secretary-General cautioned (UN General Assembly, 2019). This is of particular concern as many SIDS continue to face challenges in accessing concessional financial resources from multilateral donors (UN General Assembly, 2019) or are even prevented to do so due to eligibility criteria insensitive to the special circumstances of SIDS (AOSIS, 2020). The Association of Small Island States (AOSIS) therefore urgently called in a recent statement on debt for a holistic approach, including liquidity support and debt service suspension, the possibility for SIDS to effectively engage in the global financial system and a SIDS vulnerability assessment (AOSIS, 2020). Similarly, ECLAC very recently reiterated its call for the implementation of this debt relief initiative in light of the additional financial burdens posed by the COVID-19 pandemic⁹.

Methodological approach

CLIMADA - A probabilistic natural catastrophe damage model

The projections on damages from future tropical cyclones are based on a probabilistic natural catastrophe damage model called CLIMADA.

CLIMADA allows to estimate the expected economic damage as a measure of past disaster losses, the incremental increase from economic growth and the further incremental increase due to climate change. The economics of climate adaptation methodology as implemented in CLIMADA provides decision makers with a fact base to understand the impact of weather and climate on their economies, including cost-benefit perspectives on specific risk reduction measures.

For the analysis in this briefing paper, we use (1) data (1950-2018) from IBTrACS (International Best Track Archive for Climate Stewardship) as basis for the probabilistic modelling of the tropical cyclone hazard, (2) LitPop (Nightlight and Population) exposure data to estimate gridded asset value distributions (Eberenz, 2020) and (3) a damage function for wind-induced damages on physical asset values (Emanuel 2011).¹⁰ We apply a constant depreciation rate of 2% to account for the

⁸ For more information on the proposal, see here:

<https://www.cepal.org/sites/default/files/news/files/nydbetreliefcaribbeannovember2017.pdf> and on the reiterated call for its implementation here:

https://www.cepal.org/sites/default/files/presentation/files/final-finalids_session_at_hlpf_2020_abi9_1.pdf.

⁹ See this presentation by ECLAC's Executive Secretary Alicia Bárcena:

https://www.cepal.org/sites/default/files/presentation/files/final-finalids_session_at_hlpf_2020_abi9_1.pdf.

¹⁰ Note that damages stemming from storm surge are not considered in this analysis.

depreciation of the capital stock and a growth rate of the asset values equal to the median of the capital stock growth rate from the Penn World Tables (Feenstra et al., 2015) over the past 20 years.

We calculate the annual expected damages and the magnitudes of extreme events of different return periods to capture the occurrence of very intense tropical cyclones. Additionally, we provide an indicator of the fraction of the climate change-induced risk which is dependent on the global warming level and thus, mitigation action.

The code and the output data are available on gitlab (<https://gitlab.com/climateanalytics/climada>).

The analysis in this briefing paper focuses on a sample of Caribbean SIDS with high exposure to tropical cyclones for demonstration purposes.

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