

**Global Supply Chain Forum  
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**Climate change adaptation, resilience-  
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ports**

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**Impacts and Economic Implications of Disasters  
on Critical Transport Infrastructure in the  
Caribbean**

Presentation by

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# Impacts and Economic Implications of Disasters on Critical Transport Infrastructure in the Caribbean

*Presented by  
Willard Phillips  
UN-ECLAC*





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The Caribbean region is **extremely vulnerable to natural hazards** and the effects of major hurricanes driven by climate change in 2017 confirm this reality. In this **highly trade and tourism-dependent** region, **seaports and airports are critical infrastructure** since they facilitate the delivery of goods necessary for economic and social activities.

In many Caribbean states **seaports also receive cruise-ships** which are a major component of the region's tourism services economy, and are **indispensable for disaster response**, including the receipt of emergency supplies typically necessary for restoring normalcy after an extreme event. Island ports are therefore **central to the Caribbean supply chain**, and service disruptions can generate significant concomitant effects to Caribbean economy and society.





# Impacts of Disasters on Critical Coastal Transport Infrastructure



## Sea-ports

Climate driven Sea-Level-Rise often exceeds the global average in the Caribbean and has resulted in significantly higher storm surges which accompany tropical cyclones. Under these conditions, seaports are subject to more significant impacts including damage to piers, breakwaters, and navigational systems, as well as flooding, and damage to warehousing, HVAC systems and port equipment.



## Airports

Most Caribbean airports are located on the coastal zone. Hence, they are often impacted by flooding of runways, aprons and terminals; damage/destruction of navigational and communication aids, and damage of HVAC systems.



## Coastal roadways

Seaports and airports are typically linked by major roadways/highways along the coastal zone. These are also typically disrupted/damaged with the occurrence of natural events.



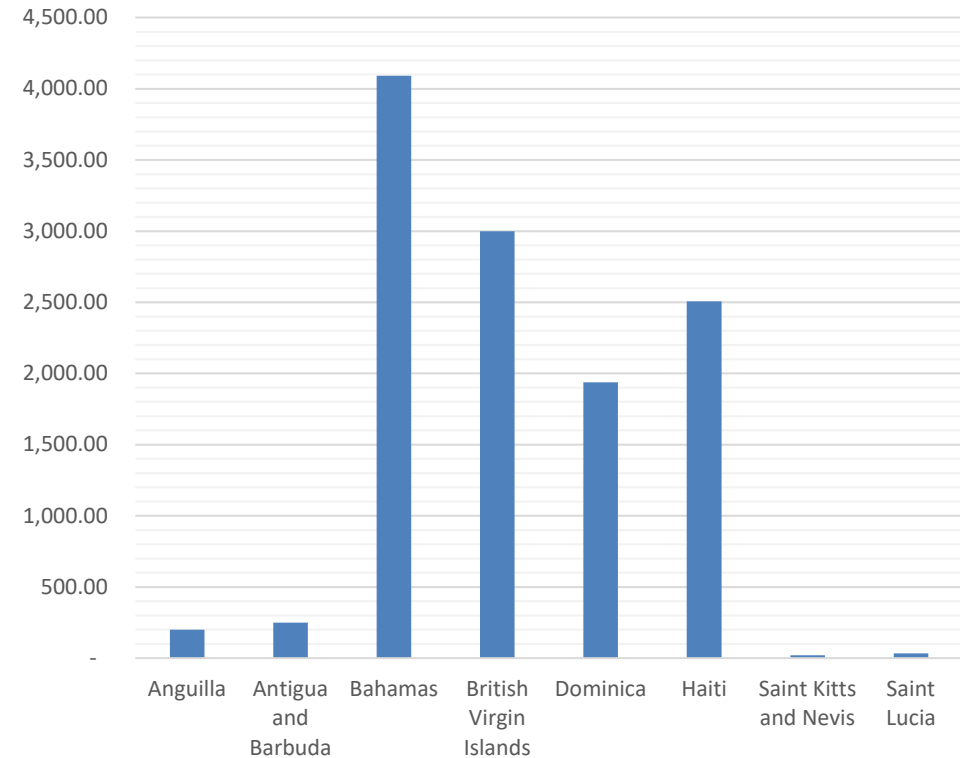


## Economic Impacts

This is often very significant for Caribbean SIDS, for which disasters caused a total loss of USD22 billion or roughly 2.4% of GDP for the region as a whole between 1950 – 2016 (IMF, 2018). For example, in 2017, Dominica suffered total damage and loss of USD1.2 billion. This was in excess of 226% of GDP. Similarly, in 2019, Hurricane Dorian caused damage and losses excess of USDUS \$3.4 billion in The Bahamas, exacerbating debt levels and other fiscal stresses.



### Economic Cost of Disasters - 2015 - 2023 Selected Caribbean Countries (USD Millions)



Source: CEPALSTAT



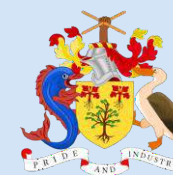


## Impacts on Sea-Ports

Damage of port infrastructure, often results in temporary suspension of commercial shipping and cruise services. Economic losses can increase very quickly. Direct impacts assessed between 80% - 200% GDP. Also, disruption of trade flows of both goods and services; and loss of revenues (fees and taxes) due to shutdowns.

There's also typically damage to roads, ramps, piers, railings and electricity and telecommunications systems

For instance, Dominica experienced damage and losses in excess of 226% of GDP due to Hurricane Maria in 2017.





## Impacts on Airports

Damage to infrastructure, and losses due to suspension of services can be substantial for airports. This was the case for St. Maarten, where Hurricane Irma caused USD2.1 billion in damage and loss. Of this amount, the tourism sector suffered losses of USD855.5 million. Airport closure was responsible for a significant share of such losses.







Cruise port and marina services critical for Caribbean economies

## Implications

Increased frequency of extreme weather events means increased challenges to port infrastructure in the future. Also, for *both* seaports and airports there will be greater costs for adaptation to the threats from sea-level rise. Increased ambient temperatures will also make it difficult for port workers which could in turn affect worker productivity and port efficiency. Disruptions of cruise shipping and marina services are also likely to increase. These are all important subsectors for the economies of Caribbean SIDS. Finally, from the standpoint of climate mitigation, changing IMO standards and regulations for ship bunkering will have further impact on the efficiency of providing this service in Caribbean sea ports.



## Strategic Issues - Recommendations

- Minimizing operating costs – improving operational efficiency
- Attracting and maintaining liner shipping connectivity
- Enhancing port resilience
- Accommodating cruise and domestic passengers
- Training of human resource
- Protecting Port Environment
- Utilizing port services in restoring normalcy and building redundancy
- Promoting overall mainstreaming of climate change adaptation in port management



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# Thank you!

