

ADAPTING COASTAL CITIES AND TERRITORIES TO SEA LEVEL RISE IN THE CARIBBEAN REGION

Challenges and Leading Practices



OCEAN & CLIMATE
PLATFORM



SHARING SOLUTIONS WITH COASTAL
CITIES TO TACKLE SEA LEVEL RISE

Partner



An aerial photograph of a tropical beach. The water is a vibrant turquoise color, transitioning to a lighter shade near the shore. The beach is a mix of white sand and dark volcanic rocks. Several palm trees are scattered along the shoreline, and a few people can be seen swimming in the water. The overall scene is bright and sunny.

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The Ocean & Climate Platform, Who are we?

The Ocean & Climate Platform (OCP) is an international network bringing together more than 100 organisations from civil society (NGOs, research institutes, foundations, local authorities, international organisations, and private sector entities). Created in the run-up to COP21 in Paris, the OCP aims to promote scientific expertise on the major role played by the ocean and its ecosystems in the climate system, and to advocate for better consideration of these interactions by national and international decision-makers. Building on the wide-ranging expertise of its members, the OCP brings light to concrete solutions to protect the ocean, its biodiversity, and the climate.

The OCP's mandates in international fora

- The Ocean & Climate Platform holds the **observer status** to the **United Nations Framework Convention on Climate Change (UNFCCC)**, along with several key roles:

Focal point for "Ocean & Coastal Zones", Marrakech Partnership for Global Climate Action (MP-GCA), led by the High-Level Climate Champions, it mobilises non-state actors to raise ambition and accelerate climate action.

Expert for "Ocean and Coastal Zones", Nairobi Work Programme on Adaptation (NWP-Ocean), which provides a knowledge hub to better integrate marine and coastal issues in Parties' adaptation and resilience strategies.

Taskforce Lead for "Ocean and Coastal Zones", Sharm el-Sheikh Adaptation Agenda (SAA), which rallies both countries and non-state actors behind a shared set of adaptation actions.

Informal advisor for the Ocean and Climate Change Dialogue (OCD), mandated by the COP, it convenes Parties and non-party stakeholders to strengthen ocean-based action under the UNFCCC processes.

- The OCP has been participating in the **French governmental review of the IPCC reports**, including the Sixth Assessment Reports (AR6) and the Special Reports on 1.5°C and the Ocean and Cryosphere (SROCC).

- The OCP is also an observer organisation to the **United Nations Convention on Biological Diversity (CBD)** and to the **United Nations Economic and Social Council (ECOSOC)**.

- The OCP, together with the Varda Group, has been mandated by the governments of France and Costa Rica to facilitate the mobilisation of civil society for the preparation of the **3rd United Nations Ocean Conference (UNOC)** in Nice in June 2025.

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The Sea'ties Initiative

The Sea'ties Initiative aims to facilitate the development of public policies and the implementation of adaptation solutions to support coastal cities threatened by rising sea levels. Led by the Ocean & Climate Platform, the initiative is intended for elected representatives, administrators and stakeholders involved in this transition as a forum to exchange knowledge and experiences of sustainable solutions towards coastal resilience. Sea'ties is an international initiative which mobilises coastal experts and cities from five regions of the world featuring a diversity of climatic, geographic, social, economic and political contexts. A diversity of solutions has already been implemented across the world and can be inspirational for other coastal cities and territories. By making connections between real world experiences and characterising them through illuminating scientific works, we can promote the most suitable practises and support the choices of political decision-makers and regional administrators.

Primary goals

1/ **Compile scientific knowledge and data** into accessible summaries and databases, identifying and analysing solutions deployed by coastal cities across the world.

2/ **Foster the emergence of good practices and facilitate the exchange of knowledge and experiences** between coastal stakeholders during regional workshops. Leverage collective reflection for the identification of enabling factors for the deployment of sustainable adaptation solutions.

3/ **Encourage the integration of adaptation challenges into public policies** by promoting real world experience complemented with scientific knowledge, and by submitting policy recommendations to decision makers so they can integrate the most suitable solutions into their international and national public policies.

Regional workshops

Six regional workshops were organised between 2021 and 2024, mobilising experts and key stakeholders working on adapting coastal cities and territories to sea level rise. By facilitating the exchange of knowledge, practices and experiences; and highlighting the plurality of approaches and solutions implemented across the world, these workshops informed the production of recommendations and the advocacy work of the Ocean & Climate Platform.



Reference tools and documents

The Sea'ties Initiative contributes to the enhancement and diffusion of knowledge on adaptation issues through the production of scientific papers, reference tools and documents to the address of the scientific community, policymakers, and the public.

• [Policy Recommendations for Coastal Cities to Adapt to Sea Level Rise](#)

The Policy Recommendations for coastal cities to adapt to sea level rise draw upon the expertise and on-the-ground experiences of over 230 stakeholders mobilised during regional workshops and are supported by 80 organisations worldwide. Intended for local, national, regional and international decision-makers, they highlight four priority actions: (1) Solutions: Planning long-term adaptation responses tailored to the local context, (2) Social justice: Prioritising social imperatives in adaptation policies, (3) Knowledge: Developing new ways to generate and share operational knowledge on adaptation, (4) Finance: Building a sustainable finance approach for coastal cities.

• [Regional and thematic reports](#)

Sea'ties organised a series of regional and thematic workshops, informing reports that analyse challenges, showcase leading practices, and offer actionable recommendations to help coastal cities adapt to sea level rise. These include regional reports titled "Adapting Coastal Cities and Territories to Sea Level Rise: Challenges and Leading Practices" for [Northern Europe](#), the [Mediterranean](#), [North America](#), [West Africa](#), and the [Pacific](#).

Additionally, a thematic brief, "[Nature-based Solutions for Resilient Coastal Cities](#)" was developed to explore key levers to implement NbS for coastal adaptation.

• [The Sea'ties Declaration](#)

Initiated by the OCP, the French Government and the City of Brest, with the support of ICLEI and Race to Resilience, the Sea'ties Declaration commits more than 70 mayors, governors, and city networks across the world to the challenges of adapting coastal cities and territories to sea level rise. Highlighting four priority strategies, the Declaration is a call to accelerate adaptation action addressed to the international community.

• [Scientific Article - Designing Coastal Adaptation Strategies to Tackle Sea Level Rise](#)

The article "Designing Coastal Adaptation Strategies to Tackle Sea Level Rise" is a synthesis of scientific literature and presents four archetypes of adaptation strategies to sea level rise. These are analyzed according to their governance modalities and characterized based on their degree of implementation complexity. This synthesis was co-written by scientists from the RTPi-Sea'ties, co-led by the OCP and CNRS, and was published in the Journal Frontiers in Marine Science, Ocean Solutions section in November 2021.

• [The Blue-Tinted White Paper, Investment Protocol: Unlocking Financial Flows for Coastal Cities](#)

Adaptation to Climate Change and Resilience Building highlights the financial gaps and opportunities for coastal cities' adaptation and provides recommendations to unlock financial flows at scale.

• [Policy Brief - Adapting Coastal Cities and Territories to Sea Level Rise](#)

The policy brief "Adapting Coastal Cities and Territories to Sea Level Rise" addresses the challenges faced by stakeholders in the field of adaptation, and highlights the essential elements of a sustainable transition of coastal territories.

• [Map of Solutions](#)

The Map of Solutions is an interactive cartography listing adaptation responses implemented around the world. It provides project leaders with feedback, takeaways, and cautionary remarks to inform the design and the implementation of adaptation.

Editorial

CITY OF POINTE-À-PITRE, GUADELOUPE

The coastline lies at the heart of Pointe-à-Pitre's identity. The city's economic activities, social connections, cultural identity, and political life are deeply intertwined with it. However, this coastline is now facing multiple threats.

Impacted by the growing effects of climate change, particularly sea level rise, Pointe-à-Pitre recognises the significant challenges it faces. The threats of erosion, flooding, and coastal degradation jeopardize not only the city's infrastructure but also its quality of life and long-term future. Aware of the pressing need for action, the city has resolutely committed to fostering sustainable resilience through an approach that prioritises the protection of its residents while promoting responsible land use planning.

Nevertheless, we recognise that these issues extend beyond the municipal framework. The scope of the necessary transformations demands solidarity between territories, as well as regional and international cooperation. The signing of the Sea'ties Declaration in 2022 already demonstrated Pointe-à-Pitre's determination to adopt a global, ambitious, and collaborative approach to tackling these challenges.

In this spirit, Pointe-à-Pitre hosted the Sea'ties workshop from October 23 to 25, 2024, bringing together elected officials, practitioners, representatives of agencies, and civil society from coastal cities across the Caribbean. The workshop facilitated the exchange of knowledge and reflections on innovative and tailored solutions to address our needs.

By continuing this dialogue and multiplying collaborations, coastal cities in the Caribbean will pool their resources to better confront common challenges. These exchanges will strengthen local capacities and pave the way for a resilient, sustainable future marked by innovation and shared prosperity.

Harry Durimel
Mayor of Pointe-à-Pitre



Editorial

CITY OF KINGSTON, JAMAICA

Coastal cities like Kingston and Pointe-à-Pitre stand on the frontlines of climate change, grappling with the growing challenges of sea level rise, the urban heat island effect, and environmental degradation. For Kingston, rising seas threaten vital infrastructure, cultural heritage sites, and our vibrant coastal ecosystems. These changes are not abstract - they are already here, altering lives and livelihoods, especially for those most vulnerable.

The heat island effect compounds these issues, particularly in densely populated urban centers. Elevated temperatures not only strain public health and energy systems but also have cascading impacts on ocean ecosystems, further endangering coral reefs and mangroves that protect our coastlines. Left unchecked, these interconnected challenges will intensify, undermining our resilience against hurricanes and other climate-driven disasters.

In Kingston, we have embraced a multifaceted approach to resilience-building. From retrofitting aging infrastructure to withstand extreme weather to restoring mangroves in the Palisades-Port Royal Protected Area, our action reflects a commitment to safeguarding our future.

However, no city can confront these challenges alone. Solid waste management remains a critical issue, impacting the health of Kingston Harbour and

the ecosystems that depend on it. Poor practices contribute to the degradation of coral reefs and mangroves, compromising their ability to shield us from hurricanes. Addressing these issues requires cross-disciplinary expertise and international collaboration.

This is why convening like the Sea'ties workshop matters. They provide a platform to share strategies, build capacity, and deepen regional ties. Kingston and Pointe-à-Pitre and other Caribbean cities can leverage our shared vulnerabilities and expertise to advance innovative, scalable solutions. By working together, we can ensure that our coastal cities are not only resilient but also thriving hubs of sustainable development.

The time to act is now. Through bold leadership and regional cooperation, we can turn shared challenges into shared triumphs, safeguarding our coastal heritage for generations to come.

His Worship the Mayor of Kingston
Cllr. Andrew A. Swaby, J.P



PURPOSE OF THIS BRIEF

This report draws on discussions held during the Sea'ties workshop "Adapting coastal cities and territories to sea level rise in the Caribbean", held on October 23-25, 2024, in Pointe-à-Pitre, Guadeloupe, complemented by 37 individual interviews held between April and September 2024, with experts working across the Caribbean region. The workshop was organised by the Ocean & Climate Platform in partnership with the French Office for Biodiversity, the Fondation de France, and Coastal Quest, with financial support from the Government of Monaco. It mobilised 40 stakeholders, including elected officials, government officials, practitioners, scientists, and NGO representatives, from 12 countries and territories to discuss adaptation practices and needs encountered in the region. Starting with an overview of sea level rise impacts and adaptation trends in the Caribbean, the discussions delved into strategies for conceiving long-term adaptation in conditions of chronic climatic stress, the importance of guiding adaptation policies with locally-relevant and timely knowledge, approaches to building resilient economies and infrastructure, and mechanisms for financing adaptation efforts.

Intended for decision-makers, urban planners, practitioners, and all stakeholders involved in adapting coastal cities and territories to sea level rise, this report provides insight into challenges faced by coastal cities, explores avenues for solutions, and highlights some of the leading practices emerging from the Caribbean. It addresses the challenges of building long-term coastal resilience in the face of chronic climatic stress, enhancing operational knowledge and adaptive capacities, and improving financing mechanisms to support the adaptation of coastal cities. This report is part of a wider series of regional studies, and it complements the conclusions of previous reports, dedicated to the regions of Northern Europe, the Mediterranean,² the U.S. West Coast,³ West Africa,⁴ and the Pacific.⁵

1/ Ocean & Climate Platform. (2022). Adapting Coastal Cities and Territories to Sea Level Rise in Northern Europe: Challenges and Best Practices. Ocean & Climate Platform. 39 pp. https://ocean-climate.org/wp-content/uploads/2022/10/Seaties_Northern-Europe_Report-1.pdf

2/ Ocean & Climate Platform. (2022). Adapting Coastal Cities and Territories to Sea Level Rise in the Mediterranean Region: Challenges and Best Practices. Ocean & Climate Platform. 48 pp. https://ocean-climate.org/wp-content/uploads/2022/10/Seaties_Report_Mediterranee_Final.pdf

3/ Ocean & Climate Platform. (2023). Adapting Coastal Cities and Territories to Sea Level Rise in North America - U.S. West Coast: Challenges and Leading Practices. Ocean & Climate Platform. 56 pp. <https://ocean-climate.org/wp-content/uploads/2023/04/Adapting-coastal-cities-and-territories-to-sea-level-rise-in-NorthAmerica-%E2%80%93-US-West-coast-Challenges-and-Leading-practices.pdf>

4/ Ocean & Climate Platform. (2023). Adapting Coastal Cities and Territories to Sea Level Rise in West Africa: Challenges and Leading Practices. 60 pp. https://ocean-climate.org/wp-content/uploads/2023/08/Report_Seaties_Adapting_Coastal_Cities_SLR_West-Africa_Final-1108.pdf

5/ Ocean & Climate Platform. (2024). Adapting Coastal Cities and Territories to Sea Level Rise in the Pacific: Challenges and Leading Practices. Ocean & Climate Platform. 48 pp. <https://ocean-climate.org/wp-content/uploads/2024/02/Seaties-Regional-Report-Pacific.pdf>

ACRONYMS AND ABBREVIATIONS

5Cs: Caribbean Community Climate Change Centre

AR6: IPCC Sixth Assessment Report

BRGM: French geological survey

CANARI: Caribbean Natural Resources Institute

CARICOM: Caribbean Community

CBO: Community-Based Organisation (sans les "s" donc)

CCRIF: Caribbean Catastrophe Risk Insurance Facility

DAPP: Dynamic Adaptive Policy Pathways

DRR: Disaster Risk Reduction

GDP: Gross Domestic Product

IOCARIBE: Intergovernmental Oceanographic Commission of UNESCO for the Caribbean and Adjacent Regions

IPCC: Intergovernmental Panel on Climate Change

LPP: Livelihood Protection Policy

MAR: Mesoamerican Reef

MRE: Monitoring, Reporting, and Evaluation

NbS: Nature-based Solutions

NGO: Non-Governmental Organization

PPP: Public-private partnership

RCP: Representative Concentration Pathway

SLR: Sea Level Rise

TC: Tropical Cyclone

SUMMARY FOR POLICYMAKERS

Caribbean low-lying, densely populated coastlines are already highly vulnerable to the impacts of sea level rise. A one metre rise by the end of the century could displace communities, damage critical infrastructure, and profoundly disrupt livelihoods and economies. In addition, the degradation of coastal and marine ecosystems reduces their natural ability to protect shorelines from erosion and storm surges, exacerbating communities' exposure to sea level rise and extreme weather events, including tropical cyclones. Targeted adaptation measures are urgently needed. However, they currently tend to be limited in scale, reactive rather than proactive, and chronically underfunded, falling short of addressing the magnitude of the risks posed by sea level rise.

1

BUILDING LONG-TERM COASTAL RESILIENCE UNDER CHRONIC CLIMATIC STRESS

- Combine **short-term disaster response with long-term measures** by adopting flexible planning approaches that anticipate transformative measures, such as planned relocation, while enabling low-regret and transitional actions to address both immediate and slow-onset change.
- Prioritise integrated strategies** that align stakeholders and policies, to maximise resources and opportunities for solutions while avoiding risk transfer and strengthen regional cooperation in critical sectors like tourism and ports to ensure coordinated efforts.
- Foster locally-led adaptation** by engaging and empowering communities early and continuously into the adaptation process.

2

IMPROVING OPERATIONAL KNOWLEDGE AND CAPACITIES TO ADAPT

- Develop **downscaled, multidisciplinary, and timely data on risks and vulnerabilities** to inform dynamic adaptation planning. Use dedicated tools to translate complex data into actionable insights for informed decision-making. Establish robust frameworks for monitoring, reporting, and evaluation to track progress and ensure effective adaptation outcomes.
- Encourage local research and observation capacities** by promoting pilot projects, collaborations between cities, universities, and the private sector, and by leveraging community-driven participation in data collection, mapping, and coastal monitoring.
- Empower local capacities and regional expertise** through training programmes and leveraging of regional cooperation and knowledge-sharing initiatives.

3

FINANCING COASTAL CITIES ADAPTATION

- Enhance local financial engineering capabilities** to secure and manage international funding and institutionalise adaptation financing within national priorities to streamline access to resources.
- Promote community-driven adaptation** by designing tailored grants and ensuring adequate budgets to support inclusive participation throughout all stages of planning and implementation.
- Mobilise diverse financing mechanisms** and sources to increase funds, provide flexibility in addressing cities' needs, and incentivise microinsurance policies to protect communities against residual risks. Bolster national budgets for adaptation through sector-specific levies and taxes earmarked for coastal adaptation.



INTRODUCTION

Current and projected sea level rise in the Caribbean

Sea levels in the Caribbean region have already risen by approximately twenty centimetres since the mid-20th century, in line with the global average, and with localised variations. Projections for sea level rise (SLR) at the 2100 horizon range from 0.29 to 0.59 metres under a low-emission scenario (RCP2.6) to 0.63 to 1.01 metres under a high-emission scenario (RCP8.5).⁶ Caribbean islands and their coastal cities and communities are highly vulnerable to SLR and other compounded impacts of climate change such as intensifying tropical cyclones (TCs), sargassum influxes, and altered rainfall patterns. TCs in particular, cause rapid erosion, beach loss, and flooding. According to the IPCC AR6, the cumulative impacts of slow-onset SLR and chronic TCs could lead to widespread devastation across the region. Meanwhile, as marine and coastal ecosystems deteriorate due to ongoing anthropogenic pressure, so does their ability to provide coastal protection - leaving shorelines more vulnerable to wave erosion and storm surges - and health, sustenance, recreation, and economic co-benefits.

Factors contributing to the vulnerability of Caribbean societies to sea level rise

Caribbean countries predominantly feature low-lying and highly developed shorelines, with half of the region's population living within 1.5 km of the coast.^{7,8} This proximity makes them highly exposed to coastal hazards. Indeed, a 1-metre rise in sea level could permanently displace at least an estimated 110,000 people in the Caribbean Community (CARICOM) nations.⁹ Informal settlements are particularly vulnerable due to their exposure in the low elevation zone, inadequate housing conditions, and lack of infrastructure needed to withstand coastal hazards.

Livelihoods and economies are closely dependent on coastlines, hence particularly vulnerable to sea level rise. Critical coastal infrastructure, such as power plants, roads, airports and seaports, face increased exposure to flooding. For instance, with a 1-metre rise in sea level, close to 80% of harbour facilities in the Caribbean will

6/ Oppenheimer, M., B.C. Glavovic, J. Hinkel, R. van de Wal, A.K. Magnan, A. Abd-Elgawad, R. Cai, M. Cifuentes-Jara, R.M. DeConto, T. Ghosh, J. Hay, F. Isla, B. Marzeion, B. Meyssignac, and Z. Sebesvari, 2019: Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegria, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 321-445. <https://doi.org/10.1017/9781009157964.006>.

7/ Mimura, N., L. Nurse, R.F. McLean, J. Agard, L. Briguglio, P. Lefale, R. Payet and G. Sem, 2007: Small islands. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 687-716.

8/ Mycoo, M.A. Beyond 1.5 °C: vulnerabilities and adaptation strategies for Caribbean Small Island Developing States. *Reg Environ Change* 18, 2341-2353 (2018). <https://doi.org/10.1007/s10113-017-1248-8>

9/ Simpson, M.C.1,2, Scott, D.2,3, Harrison, M4., Sim, R.3, Silver, N.5, O'Keeffe, E.6, Harrison, S.4, Taylor, M.7, Lizcano, G.1, Rutt, M.3, Stager, H.2,3, Oldham, J.3, Wilson, M.7, New, M.1, Clarke, J.2, Day, O.J.2, Fields, N.2, Georges, J.2, Waithe, R.2, McSharry, P.1 (2010) Quantification and Magnitude of Losses and Damages Resulting from the Impacts of Climate Change: Modelling the Transformational Impacts and Costs of Sea Level Rise in the Caribbean (Full Document). United Nations Development Programme (UNDP), Barbados, West Indies.

suffer inundation in the future.¹⁰ Meanwhile, most small island economies are heavily dependent on tourism. For instance, the sector accounts for an average of 60% of St Kitts and Nevis' GDP,¹¹ 65% for Saint Lucia,¹² and over 80% for Antigua and Barbuda.¹³ This sector, primarily concentrated in coastal areas, is the most vulnerable to disruption due to SLR. A 1-metre rise in sea level could affect 29% of all resort properties in the region and damage 49% due to storm surges and coastal flooding. The loss of beaches - a current key driver of the sector's attractiveness - further exacerbates the sector's vulnerability.

Loss of culture, heightened by displacements due to flooding that prevent the continuation of local practices, threatens adaptive capacities as societies have developed indigenous and local knowledge-based responses to living in dynamic environments susceptible to climate variability and extremes.

Current trends in adaptation strategies for Caribbean countries and cities

Adaptation in the Caribbean region often happens incrementally, in reaction to extreme climate events, tends to be limited in scale, sectoral, and does not currently match the magnitude of adaptation needs.

Coastal protection infrastructure such as groynes, rock wall, breakwaters, has received the greatest investment but tends to be thought of in isolation, disrupts natural coastal processes, and unintentionally worsens erosion. Additionally, maintenance is costly

10/ Simpson, M.C.1,2, Scott, D.2,3, Harrison, M.4., Sim, R.3, Silver, N.5, O'Keeffe, E.6, Harrison, S.4, Taylor, M.7, Lizcano, G.1, Rutt, M.3, Stager, H.2,3, Oldham, J.3, Wilson, M.7, New, M.1, Clarke, J.2, Day, O.J.2, Fields, N.2, Georges, J.2, Waithe, R.2, McSharry, P.1 (2010) Quantification and Magnitude of Losses and Damages Resulting from the Impacts of Climate Change: Modelling the Transformational Impacts and Costs of Sea Level Rise in the Caribbean (Full Document). United Nations Development Programme (UNDP), Barbados, West Indies.

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13/ World Travel & Tourism Council. (2022). Travel and tourism in the Caribbean. <https://wtcc.org/Portals/0/Documents/Reports/2022/Travel-and-tourism-in-the-caribbean.pdf>



and resource-intensive. Land reclamation has also been implemented for decades to address land shortages arising from population growth, enabling many cities such as Port of Spain in Trinidad and Tobago, and Pointe-à-Pitre in Guadeloupe, to expand available space for housing and industrial development. Meanwhile, accommodation, such as elevating roads or buildings, has not been contemplated as a widespread option due to prohibitive costs.

Beach nourishment has also been employed, to protect assets and infrastructure, notably in tourist areas. However, islands have limited sand stocks and sediment extraction can aggravate risks and accelerate ecosystem deterioration if implemented without necessary precautions and regulations.

Increasingly, Caribbean states and territories are exploring Nature-based Solutions (NbS). NbS approaches entail a range of options, including restoration and conservation, ridge-to-reef geared towards watershed management, and hybrid options such as artificial reefs. Success of these measures against extreme events varies but NbS can play an important part in a portfolio of adaptation strategies. In 2017 in Saint-Martin, the dense indigenous vegetation belt that had been preserved buffered the waves of TCs Irma and José, reducing the extent of marine inundation and shoreline retreat to a 30-m-wide coastal strip. In contrast, shoreline retreat exceeded 160 m in deforested areas.^{14,15}

Relocation and planned resettlement are increasingly occurring but remain an adaptation option of last resort due to the high economic and sociocultural costs incurred, and implementation complexity. Notably, Jamaica has already equipped itself with a Resettlement Policy Framework aligned with its National Development Plan, and towns such as Petit-Bourg in Guadeloupe and Le Prêcheur in Martinique have implemented it.

14/ Virginie Duvat, Valentin Pillet, Natacha Volto, Yann Krien, Raphaël Cécé, Didier Bernard, High human influence on beach response to tropical cyclones in small islands: Saint-Martin Island, Lesser Antilles, *Geomorphology*, Volume 325, 2019, Pages 70-91, ISSN 0169-555X, <https://doi.org/10.1016/j.geomorph.2018.09.029>.

15/ Valentin Pillet, Virginie Duvat, Yann Krien, Raphaël Cécé, Gael Arnaud, Cécilia Pignon-Mussaud, Assessing the impacts of shoreline hardening on beach response to hurricanes: Saint-Barthélemy, Lesser Antilles, *Ocean & Coastal Management*, Volume 174, 2019, Pages 71-91, ISSN 0964-5691, <https://doi.org/10.1016/j.ocecoaman.2019.03.021>.

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BARRIERS TO COASTAL ADAPTATION COMMONLY FACED BY CARIBBEAN COASTAL CITIES:

Governance and capacity challenges hinder cities' efforts for long-term adaptation.

Difficulties in articulating the need for both emergency responses and long-term adaptation.

The imperative for immediate recovery from TCs and competing short-term development priorities often overshadows the need for long-term adaptation strategies. The gradual nature of SLR can lead to the underestimation of its urgency and is further exacerbated by mismatching political cycles that prioritise short-term gains and commitments.

Regional cooperation is underutilised due to economic, governance, and social disparities between nations. Limited funding and opportunities for developing joint initiatives reflects this issue, impeding stronger collective action and mutual learning. Cities are often further isolated from these efforts as regional cooperation primarily remains state-driven.

The lack of coordination across government departments, local authorities and stakeholders hinders effective adaptation planning. Local authorities often struggle to develop and manage

adaptation strategies, due to limited capacities, insufficient institutional support and guidance. Challenges include weak governance mechanisms for urban planning, misaligned tourism policies and building codes, a lack of integrated policies across sectors, and insufficient enforcement of existing rules.

Uneven localised knowledge limits the development of informed adaptation strategies

Data on SLR, vulnerability, and risks is uneven across the region. Some countries, like Barbados and Jamaica, have more robust datasets, while others, such as Haiti and Dominica, face challenges linked to limited resources and capacity constraints.

Downscaled information on the risks, vulnerabilities, and solutions is lacking at the local level. Knowledge gaps include limited regional climate modelling, insufficient localised understanding of impacts of SLR and of available adaptation measures, as well as a lack of proper monitoring tools to track changes.

Accessing and sharing knowledge, while crucial to addressing some critical knowledge gaps, remains underdeveloped due to inconsistent protocols, methodologies, and limited awareness of available organisations and platforms. Limited data sharing among municipal and governmental departments further hinders progress.

Capacity constraints and underutilisation of local knowledge and expertise present challenges to adaptation planning. The region needs to expand the cadre of skilled workers in areas like data collection, climate modelling, technical analysis, and project preparation - including feasibility studies, grant writing, etc. Local communities often possess valuable insights into local environmental conditions and traditional practices that can complement scientific data and can be leveraged to strengthen and sustain responses.

Financing shortages and dependence on external funding constrain the ability to take effective and transformative action

Budgetary constraints limit the availability of national adaptation funds, while capacity gaps at the municipal level impede coastal cities from accessing existing resources. Meanwhile, countries grapple with escalating debt burdens due to the financial impact of climate and natural disasters, such as TCs.

Reliance of States on international finance - which is often considered insufficient, difficult to access, and/or unsuitable - contributes to growing debt. Eligibility criteria from funders (e.g., income levels of states) and complex, lengthy funding procedures can be misaligned with local needs. In addition, development banks generally work with national governments, allocating funds to broader national priorities rather than directly to cities.

Inequitable distribution and accessibility of adaptation funds, particularly for frontline communities, and inadequate insurance systems driven by factors such as high premium costs and limited understanding of insurance, are often cited as barriers to coastal resilience.



1 BUILDING LONG-TERM COASTAL RESILIENCE UNDER CHRONIC CLIMATIC STRESS

1.1. Pathways for addressing sudden and slow onset events simultaneously with limited capacities

Planning with **Dynamic Adaptive Policy Pathways (DAPP) to support long-term, low-regret planning in conditions of uncertainty.** This approach consists in setting out alternative actions over different time horizons, capable of evolving according to changing physical and social conditions. DAPP enables coastal cities to start with immediate and feasible options while paving the way for longer-term and transformative ones, and avoiding lock-in. Importantly, DAPP relies on strong monitoring, leadership, and stakeholder engagement.

Developing a risk management framework that includes both short-term disaster response and long-term adaptation strategies. The established experience of Disaster Risk Reduction (DRR) in the Caribbean region - including early warning systems, risk awareness efforts, as well as supporting networks and institutional frameworks - can be capitalised upon to better anticipate and prepare for SLR and extreme events, and improve the flexibility of adaptation pathways.

Identifying and mapping vulnerable populations, critical coastal infrastructure and ecosystems is essential for effective adaptation planning. Indeed, prioritising areas most at risk of both sudden shocks and long-term stressors helps target areas most in need of intervention and focus resources where they have the greatest impact.

Integrating NbS as part of wider adaptation strategies, as they are often more flexible, cost-effective, and inclusive than traditional engineering methods, and provide low-regret options for adapting to coastal challenges under various climate scenarios. To ensure healthy and functioning ecosystems, it is indispensable to address the multiple anthropogenic stresses they are subjected to (e.g., land-use change and fragmentation for urban, industrial, or tourism development). In line with this, the [JA-RIV project](#) in Guadeloupe focuses on restoring the Jarry marshland located in an economical area - involving addressing unauthorised occupancy, ecological restoration (abiotic parameters), soil decontamination, and awareness raising.¹⁶

Preparing for transformative actions such as planned relocation of infrastructure and activities, and re-settlements may be necessary in some areas. Such transformative actions can provide opportunities to enhance social justice and improve the wellbeing of the most vulnerable. They necessitate to be guided by comprehensive and inclusive vulnerability assessments, involving continuous and meaningful engagement of affected stakeholders and populations, and to be supported by adequate legal and financial arrangements. The municipality of Le Prêcheur, in Martinique, is taking such a proactive approach through its relocation strategy - the [OPHROM project](#).¹⁷ Notably, the municipality is planning to relocate schools and build new houses in higher, safer grounds.

16/ Conservatoire du Littoral. Projet JA Riv. <https://www.conservatoire-du-littoral.fr/211-projet-ja-riv.htm>.

17/ Ocean & Climate Platform. Map of Solutions. Habitat Renewal Actions in the French Overseas Territories (OPHROM). <https://ocean-climate.org/en/habitat-renewal-actions-in-the-french-overseas-territories-ophrom/>.

1.2. Overcoming incremental and fragmented action towards integrated and coordinated adaptation

Implementing integrated adaptation plans at the appropriate geographic scale. As impacts of SLR and adaptation often extend beyond the municipal boundaries, cities' adaptation plans should encompass the full ecological and socioeconomic continuum of the coastline and inland territories to avoid the transfer of risks and impacts, and maximise adaptation benefits. This involves enlarging the scope to consider the sediment-cell scale, entire watersheds, whole of islands, across urban, peri-urban and rural areas, or other relevant units.

Addressing siloed governance and land use planning to develop a systemic approach to coastal resilience. Policy integration across sectors such as housing, transport, and infrastructure is essential for cohesive adaptation action. Meanwhile, effective public and private land management, including the regulation of coastal development as well as the preservation and restoration of ecosystems, and the management of real estate, is important to control urban sprawl along vulnerable coastlines. Implementing existing Integrated Coastal Management frameworks helps coordinate efforts across sectors and levels of governance (from local to national). To support land management that ensures the preservation or restoration of coastal habitats, the Conservatoire du Littoral acquires vulnerable areas, converting them into public property for long-term protection. It also manages these areas in ways that balance environmental conservation with local socio-economic needs. In the [JA-RIV project](#) for instance, small businesses in the Jarry area receive technical support to vacate and restore coastal spaces, with extensions granted if necessary to allow for smooth transitions.

Integrating informal settlements and traditional land-tenure systems into adaptation policies and processes. Governments might offer conditional land-use rights in these areas, to encourage safer, regulated development, while providing the resources and protection for residents to adapt or relocate safely. In [Petit-Bourg, Guadeloupe](#), around forty households have been relocated from the "50 pas géométriques"

zone - a 50-meter coastal strip where construction is banned due to high cliff erosion rates, yet where communities have long settled.¹⁸ The ongoing relocation effort has so far been successful, in part due to offering relocated families ownership rights to their new properties - an option unavailable in their previous homes. This approach helped secure community buy-in while addressing the logistical and emotional challenges of relocation (see case study 1 below).

Strengthening coordination among national, regional, and local governments to align policies, action plans, and tools for local implementation. In sectors such as tourism, regional cooperation is especially vital. Indeed, adapting hotels, cruise operations, and recreational coastal activities requires coordinated standards across the Caribbean to prevent uneven regulations that could drive businesses to less restrictive areas, undermining both adaptation efforts and livelihoods. In line with this, the Caribbean Tourism Initiative focuses on enhancing the sector's resilience to SLR and aligning it with broader climate goals by fostering regional cooperation, involving the private sector, and promoting improved practices across the region.

1.3. Fostering locally-led approaches and community engagement

Ensuring that adaptation strategies are grounded in local and indigenous knowledge, needs and aspirations. Building trust through early and sustained engagement, transparent communication, and capacity-building of all relevant stakeholders including the most vulnerable groups, can facilitate social acceptance and avoid maladaptation. Providing direct and immediate benefits to local communities can further ensure long-term support to adaptation.

Adopting locally-led approaches to develop context-specific solutions and strengthen local economies. This involves the promotion of skill-building initiatives to pave the way for resilient jobs and

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¹⁸/ Municipality of Petit-Bourg. *Mise en sûreté des habitants menacés par le risque d'effondrement de la falaise littorale.* <https://www.ville-petitbourg.fr/mise-en-surete-des-habitants-menaces-par-le-risque-deffondrement-de-la-falaise-littorale/>.

activities, and to encourage cross-sector collaboration to align adaptation efforts and maximise their impacts. Sectoral adaptation should also be driven by local stakeholders and populations. Community-based tourism can empower local communities and help retain financial benefits within the region. The Caribbean Natural Resources Institute (CANARI)

is actively involved in promoting community-based tourism initiatives across the regions, through providing small and micro-enterprises capacity-building support and grants to strengthen their businesses and adapt their activities to climate change. Additionally, CANARI is leading efforts to scale up NbS as part of these projects.



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Reducing coastal risks in Petit-Bourg through planned relocation



SUMMARY

The town of Petit-Bourg initiated a relocation project to protect families in at-risk areas of Bel Air and Bovis from coastal erosion, aiming to ensure their safety while offering them the opportunity of acquiring ownership of their homes. Developed through consultation, the project provides tailored relocation solutions and support to minimise disruption and maintain community ties. Furthermore, emphasis is placed on managing the vacated spaces to ensure they are secured, prevent reoccupation, and facilitate acceptance of the transition. The use of educational tools, combined with personalised support and mediation, has been pivotal to the project's success.

CLASSIFICATION

-  **Risks:** erosion, landslides, collapse of the coastal cliff
-  **Typology of solutions:** relocalisation
-  **Geographical location:** Petit-Bourg, Guadeloupe
-  **Budget:** Approximately €4M (land charges, study costs, notary fees, neutralisation and security work, social support, communication, remuneration of agents)
-  **Stakeholders:** Local authorities; public services; French geological survey, Agence des 50 pas géométrique, businesses and professional organisations
Project duration: Project initiated in 2012 and ongoing

OBJECTIVES

To reduce risks for populations exposed to coastal erosion while improving their living conditions through a relocation strategy that integrates resettlement and redevelopment of evacuated areas.



ACTIVITIES

As part of its relocation project for the at-risk sites of Bel Air and Bovis, the town of Petit-Bourg implemented a strategy to address coastal risks while improving living conditions. Priority areas were identified in collaboration with the BRGM, revealing a correlation between poor living conditions and exposure to risks, which secured necessary funding for relocation activities. An urban and social project management was set up to assist families with their relocation, complementing a thorough consultation process, as well as a communication campaign.

The proposed relocation solutions prioritise homeownership by offering an affordable monthly fee (€150/month for 15 years) and a symbolic purchase at the end of the lease. The initiative has already delivered 14 homes in 2020, with a second phase comprising 25

homes to be completed by the second quarter of 2025. To minimise disruption and ensure a smooth transition, particular care is given to supporting families during the relocation process. The relocation site is located close to the original housing areas, maintaining proximity to the town centre. Additionally, existing neighbouring connections have been preserved, where desired, in the allocation of the new homes.

To prevent the reoccupation of evacuated sites and facilitate acceptance and transition for relocated families, demolition and site securing are quickly completed after relocation. A broader reflection is underway regarding the redevelopment of the spaces, including cliff securing and the potential creation of stormwater management areas and renaturation initiatives. The project to secure and enhance the coastline in areas where there is a serious threat to human life is divided into several phases over the long/medium term.

RESULTS

Out of 40 families, 32 have already been relocated to safety. Most families who had built their own homes have now become homeowners under a social rent-to-own loan scheme. The tenant households have been rehoused in social rented accommodation. Pending delivery of the second rent-to-own housing programme, 4 households have been temporarily rehoused in social rented accommodation, with 100% of the rent paid by the government. 9 families have yet to be rehoused, some of whom have been given priority and will benefit from the new homes, while others are still opposed to the project.

KEY TAKEAWAYS



- Partnership and local governance:** The relocation project in Petit-Bourg is based on a collaboration between the municipality, the Prefecture, and the various government departments, the Agence des 50 pas géométriques, and SPHLM, the agent, which is assisting the municipality with operational implementation. This partnership brought together the expertise and resources necessary to meet the challenges of relocation. Each stakeholder played a complementary role, ensuring effective coordination and tailored support.
- Long-term commitment to the population:** Numerous consultation meetings, the use of educational tools, and personalised support and mediation have helped establish a relationship of trust with residents and understand their needs.
- Locally tailored solutions:** The homeownership schemes and relocation offer were designed to meet the needs of populations whose profiles were often excluded from traditional financing options. These solutions prioritise housing types that avoid apartment blocks, instead favouring homes that foster a close connection to the land.
- Management of freed spaces:** To avoid reoccupation and prepare for sustainable development, the evacuated sites are quickly demolished and secured.



2 IMPROVING OPERATIONAL KNOWLEDGE AND ENHANCING CAPACITIES TO ADAPT

2.1. Understanding local risks and vulnerabilities over time

Assessing local vulnerabilities and opportunities for informed adaptation plans. Site-specific physical and socio-economic data are crucially needed to capture the unique vulnerabilities of each city and neighbourhood, to improve projections, and ensure informed policies in the present and future. Besides, robust local data is often a prerequisite to accessing funding for adaptation but is rarely available. To address this, the [Integrated Coastal Management programme \(AP GIL\)](#) piloted by Cerema, CACEM and CAESM, has carried out an in depth analysis and produced a diagnosis for two coastal areas in Martinique, with rendering via WebGIS of multi-hazard sensitivities and vulnerability scores for neighbourhoods and projects.¹⁹

Monitoring, reporting, and evaluation (MRE) is essential to track changing socio-economic and physical conditions, effectiveness of adaptation measures, and to make necessary adjustments to ensure the continued relevance of adaptation action. The [Adaptom project](#) evaluates NbS in French overseas territories through a methodology that assesses environmental impacts and the benefits of interventions.²⁰ Applied in the [ZAB initiative](#)²¹ in Martinique, aimed at reducing harbour basin agitation through mangrove expansion,

19/ Cerema. Appel à partenaires pour la gestion intégrée du littoral. <https://www.cerema.fr/fr/appel-partenaires-gestion-integree-du-littoral>

20/ ADAPTOM Project. Evaluer les solutions fondées sur la nature pour s'adapter au changement climatique dans les outre-mer: ADAPTOM - Caraïbe. <https://adaptom.recherche.univ-lr.fr/caraibe/>

21/ ZAB project - - Expérimentation d'une solution technique basée sur la mangrove pour la protection du port de plaisance de l'Etang Z'abricots. France Villes et Territoires Durables. <https://francevilledurable.fr/realisations/projet-zab-projet-dexperimentation-dune-solution-technique-basee-sur-la-nature-mangrove-pour-la-protection-du-port-de-plaisance-de-letang-zabricots-martinique/>

the methodology has identified promising outcomes while pinpointing technical vulnerabilities, facilitating iterative improvements. Meanwhile, Regional partnerships play a role in facilitating the exchange of lessons learnt across the region, such as the [CaribCoast project](#) which seeks to enhance regional knowledge on coastal risk prevention and standardise methods for MRE.²²

2.2. Supporting and mobilising local expertise

Building the capacity, knowledge, and practical skills for adaptation at city-level through regional cooperation and peer-knowledge exchange. Training programmes, ocean literacy working groups - such as those developed by IOCARIBE - and the pooling of regional knowledge and lessons learnt can build local expertise.

Strengthening regional and local research capacities is crucial to ensure data relevance and inform action at the appropriate temporal and spatial scales. Strengthening research capacities through projects led by regional research centres, universities, and observatories is key to providing the evidence base needed for decision-making. For instance, the [Observatoire de la Dynamique du Littoral Martiniquais \(OLIMAR\)](#) monitors and analyses the coastal dynamics of Martinique's shorelines to inform local policy.²³ Similarly, the [CoastPredict](#) project advances coastal modelling and forecasting.²⁴ Experimenting with pilot projects can further support the development, testing, and

22/ CaribCoast. <https://www.carib-coast.com/>.

23/ Observatoire de la dynamique du Littoral Martiniquais (OLiMar). <https://www.observatoire-olimar.fr/fr>.

24/ CoastPredict: Integrated Coastal and Ocean Observing System. <https://www.coastpredict.org/>.



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advancing of local solutions.

Mobilising local communities and stakeholders in data collection, coastal observation, and monitoring activities can ensure access to locally relevant data, in addition to raising awareness of SLR, fostering understanding of risks, and promoting a sense of ownership over adaptation efforts. Community-driven mapping of assets and cultural resources can provide valuable insights for comprehensive risk assessments. Importantly, local and indigenous knowledge plays an important role in driving locally appropriate adaptation strategies.

2.3. Translating complex data into actionable information for decision-makers.

Harnessing climate services and developing decision-support tools to translate data into actionable information. Incorporating local and regional datasets to simulate current and future impacts of SLR under various scenarios can support policymakers in understanding long-term risks. The Caribbean Institute for Meteorology and Hydrology (CIMH) provides tools like the [Caribbean Climate Outlook Forum \(CariCOF\)](https://rcc.cimh.edu.bb/caricof/) for seasonal climate insights.²⁵ Similarly, the Caribbean Community Climate Change Centre (5Cs) developed the [Caribbean Climate Online Risk and Adaptation Tool \(CCORAL\)](https://ccoral.caribbeanclimate.org/),²⁶ a risk-based decision-support tool that

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25/ Caribbean Institute for Meteorology and Hydrology (CIMH). CARICOF: Caribbean Climate Outlook Forum.. <https://rcc.cimh.edu.bb/caricof/>.

26/ Caribbean Coastal Risk and Adaptation Tool. <https://ccoral.caribbeanclimate.org/>.

integrates coastal climate resilience across sectors such as infrastructure and water management.

Leveraging user-friendly visualisation tools, such as dashboards and interactive mapping tools, can be particularly effective to convey complex data. For instance, *Fugro* provides tools capturing, analysing, and rendering both geohazards and risks to assets to simplify and facilitate understanding of risks. Similarly, the [Climate and Ocean Risk Vulnerability Initiative \(CORVI\)](#) incorporates environmental, economic, and social risks to help local decision-makers identify priorities for action, and Resallience worked with the Government of Barbados and IFC to develop 3D climate risk identification and resilience tools that support the prioritisation of investments opportunities based on resilience targets.²⁷

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27/ Stimson Center. CORVI Report: Climate and Ocean Risk Vulnerability Index. <https://www.stimson.org/2020/corvi-report-climate-and-ocean-risk-vulnerability-index/>.

CaribCoast: Pooling knowledge and co-creating Coastal Resilience



SUMMARY

The CaribCoast project, through its network of regional experts, has enhanced the understanding of coastal hazards related to erosion and marine submersions in the Caribbean, while improving the tools available to facilitate risk management. Special attention was given to sharing knowledge and experiences with local stakeholders and the general public to raise awareness about the challenges of coastal adaptation.

CLASSIFICATION

-  **Risks:** erosion ; submersion
-  **Typology of solutions:** Research-Action ; Capacity-building, knowledge sharing activities
-  **Geographical location:** Jamaica, Trinidad and Tobago, Puerto Rico, Martinique, Guadeloupe, Saint-Martin
-  **Budget:** €3,021,890
-  **Stakeholders:** Research Institutes; Public Services
-  **Project duration:** 4 years (2018-2022)



OBJECTIVES

The CaribCoast project, coordinated by BRGM, aimed to establish a regional network of experts focused on coastal risk prevention. The project facilitated the harmonisation of monitoring, prevention, and risk management activities related to erosion and marine submersion. It also promoted a deeper understanding of natural phenomena and coastal hazards to support the adaptation of Caribbean coasts to climate change.

RESULTS

The project delivered two mapping platforms: one focused on the vulnerabilities of Caribbean coasts ; and another on current and future hydrodynamic modeling in the region, including simulations of cyclones, tsunamis, and ocean currents. Additionally, it produced a series of practical guides and scientific articles on coastal erosion management and the contributions of nature-based solutions to coastal resilience. These tools and resources have helped document and deepen the understanding of coastal dynamics.

ACTIVITIES

The project implemented observation and modeling programmes to study coastal dynamics and the impacts of climate change in various countries and territories of the region. CaribCoast also developed decision-support tools designed to assist local policymakers in crafting adaptation strategies tailored to their specific territories. These tools incorporated co-benefits of nature-based solutions, for instance through leveraging coral reefs, seagrass beds, and mangroves, by evaluating their feasibility and effectiveness. Various awareness-raising activities were organised to facilitate data sharing and best practices, and several ecosystem restoration initiatives were undertaken.



KEY TAKEAWAYS

- **Regional collaboration and networking:** The creation of a network of experts spanning multiple Caribbean countries has enabled the pooling of knowledge and experiences. This regional partnership has facilitated the development of tools that enhance the understanding and ownership of coastal challenges by local stakeholders, as well as more harmonized coastal risk management.
- **Production of actionable data:** Data collection and model generation have provided new insights into the region's coastal dynamics. Additionally, the planning support tools developed offer precise and accessible analyses for decision-makers, thereby aiding in the identification of locally tailored solutions.
- **Ecosystem restoration across various Caribbean territories:** Mangroves in the Bahamas, seagrass meadows in Puerto Rico, coral reefs in Tobago, and coastal vegetation in Guadeloupe.



3 FINANCING COASTAL CITIES ADAPTATION

3.1. Building local and national financial capacities to support long-term adaptation

Enhancing local financial engineering capacities to improve cities' ability to conduct their adaptation. Providing technical assistance to facilitate access to funding - through support for designing bankable projects, managing funds effectively, and identifying alternative revenue streams - can play a pivotal role in ensuring the financial sustainability and long-term success of adaptation efforts. Technical assistance and capacity-building programmes can be delivered in partnership with key regional partners such as the Organisation of Eastern Caribbean States, the Caribbean Development Bank, and the Caribbean Community Climate Change Centre.

Enshrining coastal adaptation as a national priority to streamline access to financing. Integrating a comprehensive adaptation and disaster risk financing strategy into a country's broader development framework can establish a clear pathway for cities to access international and domestic financing.

Strengthening national budget capacities to secure long-term funding for adaptation, reduce debt and complements short-term, project-based international funding. National resilience funds could foster financial independence and improve access to adaptation funds for municipalities. This entails diversifying revenue sources through sector-specific levies and taxes, such as environmental levies on coastal development and coastal and marine based tourism, which should be implemented synergically across the region to prevent unfair competition. In addition, local taxes could be earmarked for coastal adaptation and contribute to socially-driven financial strategies. The [Banque des Territoires](#)²⁸ reflects this principle of socially-driven, impact investing by utilising resources primarily derived

from individuals saving accounts held by the French population, alongside public funds and investments. These resources enable the financing of territorial development, particularly actions related to climate change adaptation. The Banque des Territoires not only provides investment loans but also financial engineering support.

3.2. Fostering community-driven and inclusive adaptation financing

Sea Adopting a community-centred approach in grant design to ensure locally relevant adaptation planning. Local communities should be involved in the grant process - from planning and writing to implementation and evaluation. In line with this, NGOs and, when possible Community-Based Organisations (CBOs), should be included as grant applicants and fund managers can ensure contextually appropriate interventions, and help ensure that funding reaches the frontline groups that require prioritised support.

Securing sustained and adequate budgets for long-term community engagement. The long-term success of coastal adaptation initiatives hinges on active and informed participation, along with a sense of ownership of adaptation efforts. This requires investing in community resilience by dedicating funds to education, skill-building activities, and organisational strengthening of CBOs and NGOs in the long-term to inform and empower community engagement.

28/ Banque des Territoires. <https://www.banquedesterritoires.fr/>



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3.3. Diversifying financing mechanisms to unlock funds

Mobilising diverse mechanisms can unlock untapped funds for coastal cities' adaptation and redirect resources from investments with less impact. Research suggests diverse opportunities such as blue and green bonds, debt-for-climate swaps, carbon offset, and blended finance, that can be combined to improve flexibility and address evolving needs of coastal municipalities. However, these options necessitate further exploration and robust regulatory frameworks to ensure social and environmental sustainability. The [MAR+Invest](#) project is a blended finance mechanism designed to foster a sustainable ocean-based economy in the Mesoamerican Reef (MAR)²⁹. It supports market-based initiatives that promote reef health, community resilience, and revenue generation, while addressing early-stage capital gaps and delivering technical assistance. With a focus on long-term conservation and strong social criteria, MAR+Invest contributes to reducing the threats to the MAR, with benefits for coastal resilience at large. Likewise, The Nature Conservancy, in collaboration with the Global Fund

29/ MAR Fund. MAR+Invest: Blended Finance for a Sustainable Ocean-Based Economy. <https://marfund.org/en/mar-invest/>.

for Coral Reefs, leverages blended finance through the [BahamReefs initiative](#)³⁰ to deliver impact funding in The Bahamas. This initiative focuses on livelihoods by developing a pipeline of investable opportunities in the Blue Economy that address climate change, support coral reef health and coastal communities.

Derisking private investment through collaboration with national, local governments, and private stakeholders to make adaptation projects more attractive to investors. Establishing co-financing programmes tailored to the specific needs of each coastal city can provide the resources needed to fill the gap left by limited national budgets. Regional hubs such as the [Caribbean Climate-Smart Accelerator](#)³¹ and the [Caribbean Climate Innovation Centre](#)³² support regional innovation linked to coastal resilience and can connect cities with investors. Private entities can contribute by adapting infrastructure to sea level rise, such as raising buildings, and beyond their assets by collaborating with local stakeholders to protect and restore ecosystems like coral reefs and

30/ The Nature Conservancy. BahamaReefs: Using Blended Finance to Achieve Sustainable Outcomes. <https://www.nature.org/content/dam/tnc/nature/en/documents/ImpactFundingForBahamaReefsFactsheet.pdf>.

31/ Caribbean Climate-Smart Accelerator. <https://www.caribbeanaccelerator.org/>.

32/ Caribbean Climate Innovation Centre. <https://caribeancic.org>



Debt-for-nature in The Bahamas

The Bahamas' debt-for-nature deal, brokered by Standard Chartered, swaps USD 300 million of the nation's debt for funds dedicated to marine conservation. The initiative, involving partnerships with The Nature Conservancy, Inter-American Development Bank, Builders Vision, and AXA XL, aims to protect ecosystems like coral reefs and mangroves, enabling the management of almost 6.8 million hectares of Marine Protected Areas and the completion of a national Mangrove Management Plan, contributing to safeguarding coastlines from storms. This landmark deal leverages innovative financial instruments, including private credit insurance, and is expected to channel USD 124 million toward sustainable environmental protection. An endowment, projected to grow to USD 20 million by 2039, should ensure funding for marine conservation in The Bahamas beyond the project's 15-year term. This mechanism could be adapted for replication, with cities co-developing localised projects aligned with state-level initiatives, such as restoring urban and peri-urban wetlands.

mangroves, supporting coastal adaptation at the destination scale. Jamaica has been a pilot country for the International Finance Corporation to develop [Climate-smart Public-private partnerships \(PPP\) frameworks](#) (technical and legal guidelines), with the aim to develop and build the country infrastructure with an increased role for the private sector.³³ Hence, Jamaica is supposedly the first country in the world to integrate climate resilience into its PPP framework.

Introducing micro-insurance policies for coastal communities and small businesses to cover residual risk from climate impacts. These targeted insurances, with lower premiums, can be designed to support vulnerable populations disproportionately affected by SLR. The [Livelihood Protection Policy](#) offered by the CCRIF is a parametric microinsurance that was notably used in Saint-Lucia after TC Matthew in 2016, providing quick payouts to support the recovery of vulnerable populations such as fishers and farmers.³⁴ In addition to supporting recovery, insurance could incentivise preemptive action by offering discounts to stakeholders who implement adaptation projects.

33/ World Bank. Climate-smart public-private partnerships: Legal and regulatory framework. <https://ppp.worldbank.org/public-private-partnership/climate-smart/climate-smart-clean-technology-ppps/climate-smart-ppp-legal-and-regulatory-framework>

34/ Caribbean Catastrophe Risk Insurance Facility (CCRIF). Livelihood Protection Policy (LPP). <https://www.ccrif.org/projects/crai/livelihood-protection-policy-lpp?language.content.entity=en>

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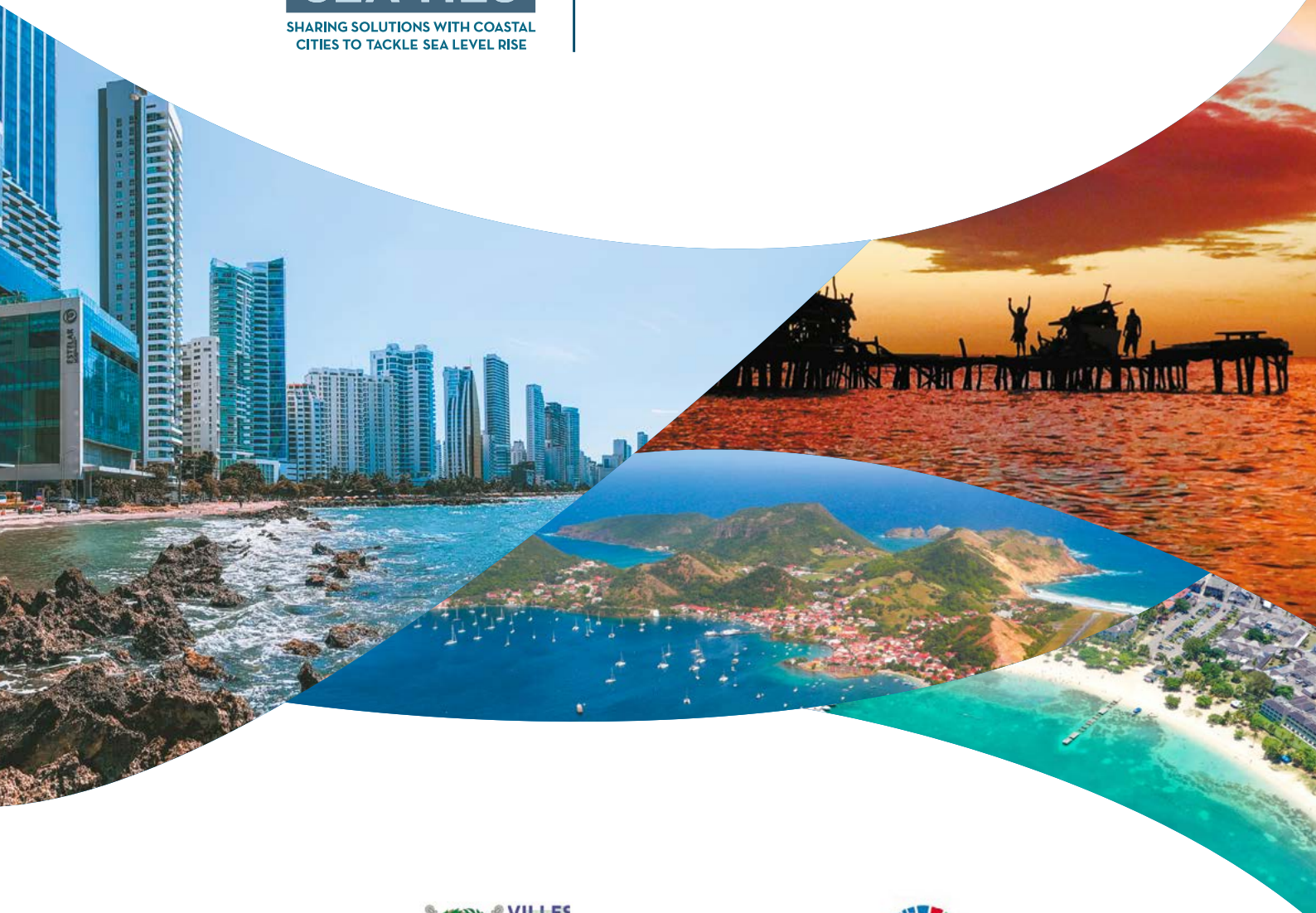


SHARING SOLUTIONS WITH COASTAL
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