CSIS BRIEFS

Taiwan's Climate Adaptation Leadership in the Caribbean

Technology, Capacity, and Strategic Cooperation

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THE ISSUE

Climate change represents an existential threat for Caribbean Small Island Developing States (SIDS), where exposure to extreme climate events intersects with structural economic vulnerabilities, limited fiscal capacity, and high economic dependence on climate-sensitive sectors. As Caribbean states seek technical expertise in climate adaptation strategies such as water resilience, disaster preparedness, and agricultural security, Taiwan—itself an island—could be a natural partner with which to collaborate on innovative and impactful projects.

INTRODUCTION

Unlike larger and more developed economies, SIDS face a narrow margin for error as recurrent climate shocks are quickly translating into economic instability, particularly in the form of macroeconomic burdens and long-term development delays. Due to inferior infrastructure, low-income economies **suffer** much greater economic consequences from natural disasters and climate change than higher-income economies do.

Recent regional and global climate assessments consistently **identify** the Caribbean as one of the most climate-exposed regions worldwide. Caribbean SIDS **experience** higher average annual climate-related losses as a share of GDP than SIDS in any other subregion, with several Caribbean countries facing natural disaster–related losses equivalent to **5–20 percent** of annual GDP. These losses far outstrip the fiscal capacity of most regional governments, making climate change not only an environmental risk but a central macroeconomic issue.

Of the thirteen countries that recognize Taiwan as a sovereign state, seven are in the Western Hemisphere and five are in the Caribbean (Belize, Haiti, Saint Lucia, Saint Kitts and Nevis, and Saint Vincent and the Grenadines). As natural disasters such as **hurricanes**, droughts, floods, and landslides are expected to become more frequent and intense in the coming decades, Caribbean nations must continue to work on climate adaptation and climate resilience to preempt the worst impacts of natural disasters and acute weather events. In this regard, Taiwan has expertise and technology that could inform the climate policy debate in the Caribbean.

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Taiwan's voluntary **compliance** with the UN climate process, despite the fact that it is not a member of the United Nations Framework Convention on Climate Change, places the island country in a good position to exert leadership on the global stage, particularly as other countries seek to roll back their international assistance. Taiwan has decades of practice managing compound climate events and scarce fresh water, making it a living laboratory for climate adaptations that are relevant to coastal and small island states. Taiwan's technology-heavy approach to climate adaptation is especially relevant to Caribbean island states. Technology transfers, such those related to precision irrigation and disease surveillance, are particularly important given the Caribbean's need for more **investment** in meteorological and hydrological services to strengthen forecasts and provide life-saving early warnings. **Previous research** by the CSIS Americas Program in 2023 indicated that the targeted approach undertaken by the Taiwan International Cooperation and Development Fund (TaiwanICDF) is well poised to address climate resilience issues facing the Caribbean. In particular, Taipei's previous assistance in developing drought- and pest-tolerant crops in **Guatemala** and **Belize** could serve as the basis for further cooperation with other Caribbean partners.

This paper will first describe the various climate hazards and impacts facing small Caribbean island states, as well as their barriers to climate adaptation. It will then detail sectors in which Taiwan could cooperate with these states on climate change resilience, offering country-specific as well as general cooperation recommendations.

CLIMATE HAZARDS AND IMPACTS

ESCALATING CLIMATE HAZARDS

Caribbean climate risk is shaped by the interaction of high-impact sporadic events and slow, constant climatic stresses, both of which are becoming more severe and more frequent as global temperatures continue to rise. Acute shocks such as hurricanes, intense rainfall, storms, and flooding cause immediate and often widespread damage to infrastructure, housing, and productive sectors. From 2000 to 2022, Caribbean SIDS sustained more than **$91 billion** in collective indirect economic loss from severe weather events, while all other SIDS worldwide suffered around **$15 billion** in combined losses during that time. The increasingly **devastating effects** of severe weather events and the **high concentration** of infrastructure and economic activity along vulnerable coastlines puts Caribbean SIDS in a particularly precarious position.

Sea level rise in the Atlantic basin is occurring at a pace that is **faster** than the global average, accelerating coastal erosion, flooding, and ecosystem degradation. As rising seas increase saltwater intrusion into freshwater aquifers, the **supply** of water for agriculture, drinking, and productive uses has been undermined in the region. It is not just access to water that is threatened; across Caribbean SIDS, up to 1,500 square miles (roughly 3,900 square kilometers) of land could be lost due to rising seas and coastline erosion by 2050. In total, the economic value of land loss from sea level rise and associated erosion in these island nations is projected to reach between **$406 billion and $624 billion** by 2050.

Droughts and increasing rainfall variability further increase climate risk across the region. Prolonged dry cycles characterized by inconsistent precipitation patterns have heightened already constrained water resources and storage infrastructure. Severe drought episodes in **Saint Lucia**, **Saint Vincent** and the **Grenadines**, and **Belize** in 2015, 2019, and 2023–24 triggered widespread water rationing, disrupting agricultural production, tourism stability, and household consumption. These episodes demonstrate the **structural fragility** of water management systems in the aforementioned countries, leaving communities and productive sectors highly exposed to climate fluctuations. As climate change amplifies severe conditions in the water cycle, water insecurity is increasingly emerging as a constraint on economic activity, public services, and long-term development across the Caribbean.

Hurricanes are a particular threat, accounting for about **91 percent** of estimated economic losses attributable to climate change in the Caribbean. A lack of early warning systems across the region means that citizens are ill-prepared when disasters strike; at the same time, underdeveloped disaster preparedness plans leave local officials without the tools necessary to mitigate damage from hurricanes. While all SIDS suffer disproportionately from the effects of climate change, the uniquely devastating effects of hurricanes make Caribbean SIDS especially vulnerable to economic and physical destruction.

SECTORAL ECONOMIC IMPACTS

Climate risks in the Caribbean are primarily concentrated in a small number of highly exposed economic sectors—a state of affairs that amplifies climate change vulnerability and limits economic diversification options.

Agriculture and food systems are particularly sensitive to climate change. Caribbean farmers **rely** heavily on rainfall for cultivation, due to intrinsic characteristics such as **fragile soils** and limited **irrigation infrastructure**. Climate projections predict yield declines of **10–30 percent** by 2050 for key crops under current temperature increase scenarios.

The loss of the banana crop in Saint Lucia serves as a harrowing example of what may be in store for the region. From 1992 to 2004, Saint Lucia saw a nearly **70 percent decline** in banana exports due to hurricanes and Black Sigatoka disease. Today, Black Sigatoka is **spreading** more effectively due to climate change, making the country's banana industry only about half as productive per hectare as the international standard. Fortunately, the government of Saint Lucia asked Taiwan for help in this area, and the **Banana Black Sigatoka Disease Prevention and Treatment Project** was born. This project introduced new disease-resistant bananas and provided farmers with training on how to prevent the disease on their farms.

The agriculture sector's struggle in the face of climate change represents more than just a major economic loss; it also threatens rural livelihoods and increases food insecurity in a region where food import dependence has been growing rapidly. Every Caribbean SIDS has become increasingly reliant on food imports in the past two decades; many now import over **90 percent** of their food. On average, the region imports **67.5 percent** of all its food.

Tourism—the economic backbone of many Caribbean SIDS—is also increasingly exposed to climate-related stress. For example, tourism accounts for more than half of the GDPs of **Saint Lucia** and **Saint Kitts and Nevis**, and more than a quarter of that of **Saint Vincent and the Grenadines**. The Caribbean is more dependent on tourism than any other area of the world; the industry supports **2.5 million jobs** across the region. Nearly all tourism infrastructure is in high-exposure coastal zones, making the sector truly vulnerable to climate change impacts.

Fisheries and marine ecosystems are also under severe pressure across the Caribbean. Rising sea surface temperatures are driving more frequent marine heatwaves that increase risks of coral bleaching, ocean acidification, pollution, and overfishing—all of which threaten livelihoods in coastal communities. Hard coral cover in the Caribbean declined by **about 48 percent** from 1980 to 2024, and global projections indicate that **70–90 percent** of reef-building corals could be lost by 2050. The decline of coral reefs has negative economic and environmental impacts. Economically, reef loss threatens incomes and food access for households that depend on small-scale fishing and near-shore resources. The loss of coral reefs also reduces natural coastal protection from different climate risks such as storms, flooding, and erosion. This is particularly true in the case of the Caribbean, as critical infrastructure assets and population centers are concentrated along the coast. Taiwan faces the same risks, as its critical technological and military infrastructure, as well as population centers, are centered in coastal areas. Taiwan's **experience** using genetic technology and intentional infrastructure to protect its coral reefs makes it an optimal partner for Caribbean SIDS looking to protect the reefs that both undergird their tourism sectors and provide a natural defense against climate change.

SOCIAL AND HUMAN DEVELOPMENT IMPACTS

Beyond economic losses, climate change in the Caribbean is generating social and human development consequences. Rising temperatures are already **negatively impacting** labor productivity, especially in agriculture and construction. Heat-related health risks are projected to **rise** in the Caribbean, with direct implications for livelihoods, labor, and household welfare.

Furthermore, public health systems, which already suffer from financing and staffing concerns, also face climate-related impacts. Higher temperatures and changing rainfall patterns are expected to increase possibilities for vector-borne diseases. The World Bank **classifies heat** as an escalating risk in the Caribbean, jeopardizing urban services and health systems.

Over time, and especially in a region as vulnerable as the Caribbean, repeated climate shocks function less like isolated disasters and more like overall development shocks. They damage housing and local infrastructure, interrupt public services like education and health, and impact the most relevant sectors for the region's economic stability.

STRUCTURAL BARRIERS TO CLIMATE ADAPTATION IN CARIBBEAN SIDS

Despite widespread recognition of extreme climate risk and strong policy commitments at the international level, Caribbean SIDS suffer from deep structural barriers that constrain their ability to put in place efficient and sustainable climate change adaptation practices.

FISCAL CONSTRAINTS AND ADAPTATION FINANCING GAPS

Fiscal constraints constitute one of the most formidable challenges to climate adaptation in the Caribbean. Many Caribbean SIDS face high public debt, weak tax bases, and limited fiscal buffers, all of which significantly constrain governments' ability to finance large-scale investment projects to promote climate resilience. Public debt in several Caribbean countries exceeds **70–90 percent** of GDP, making it incredibly difficult to capture internal or external funding for adaptation goals. Global adaptation finance flows remain deeply misaligned with Caribbean needs. If funding stays consistent with 2022 levels, Caribbean SIDS will face a more than **$6.1 billion** average annual deficit compared to what is necessary to sufficiently adapt to the changing climate. Moreover, a large share of climate finance for vulnerable countries is delivered as **loans**, not grants; this tends to privilege project-based financing, limiting the continuity of efforts and hindering long-term adaptation effectiveness. As a result, repeated disasters force governments to reallocate already scarce resources for emergency response and reconstruction, causing them to enter a **rebuild-destroy-rebuild cycle** that limits their development potential.

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INSTITUTIONAL AND TECHNICAL CAPACITY LIMITATIONS

Institutional capacity constraints further undermine the effectiveness of climate adaptation efforts across the Caribbean. Latin American and Caribbean states allocate **very small proportions** of their annual budgets to disaster risk reduction, with **most of those funds** directed toward emergency response and recovery rather than prevention and risk reduction. This imbalance reflects not only the fiscal pressure that climate change exerts on Caribbean states, but also the limited institutional planning capacity to prevent and decrease disaster risk and to convert these adaptation efforts into national development strategies that allow countries to succeed in this area.

Early warning systems and hydrometeorological services, widely recognized as the most cost-effective adaptation investments, remain underdeveloped across the Caribbean. Even in cases where national-level systems are in place, many countries still lack **last-mile connectivity**—meaning that while a developed telecommunications system may exist, its ability to reach end users quickly and reliably is limited. This, in turn, **limits** the capacity of effective communication and warning systems to adequately serve rural, fishing, and coastal communities that are at higher risk of being affected by climate disasters.

Technical gaps constitute one of the main reasons for the lack of effective translation of climate information into actionable decisionmaking from governments. In many Caribbean countries, limited institutional capacity means that a small number of technical and prepared staff are responsible for multiple functions, from data collection to project design and reporting, as well as management; this reduces the effectiveness and continuity of governments' work. A World Meteorological Organization assessment identified persistent **deficits** in meteorological equipment, climate and hydrological modeling capacity, data management systems, and digital infrastructure, which further limits countries' ability to generate, analyze, and implement climate information for project efficiency and execution.

STRUCTURAL ECONOMIC VULNERABILITIES AND INFRASTRUCTURE GAPS

Caribbean economies are disproportionately made up of climate-sensitive sectors. Reliance on industries such as

tourism, fisheries, and construction means the economic effects of climate change are multiplied. For example, agriculture in the Caribbean continues to be characterized by **low yields and limited adoption** of climate-resilient technologies, which constrains farmers' capacity to adapt to extreme weather events. Similarly, lack of investment in addressing the effects of climate change on marine life and environments is resulting in declining fisheries and fewer opportunities for ecotourism. As these industries falter, investment becomes even more difficult. Thus, structural weaknesses perpetuate a cycle of ecological destruction and economic decline.

Large infrastructure and investment gaps are already hindering adaptation capacity in the region. To meet the United Nations' Sustainable Development Goals, Caribbean countries will require more than **$21 billion** in resilient infrastructure investment by 2030, particularly in water, sanitation, energy, transport networks, and digital infrastructure. Meanwhile, total foreign direct investment in the Caribbean in 2024 totaled just **$15.2 billion**. Due to this gap, progress has been slow, delaying development and leaving these economies particularly exposed to climate risks.

PRIORITY SECTORS FOR TAIWAN-CARIBBEAN CLIMATE COOPERATION

Taiwan has deep and varied **experience** in climate adaptation projects, making it an ideal partner for Caribbean SIDS seeking to mitigate the effects of climate change in innovative ways. Taiwan has dealt with many of the major climate challenges affecting Caribbean SIDS, such as **flooding**, **water insecurity**, and **coastal environmental degradation**. At home, Taiwan has been leading groundbreaking efforts to deal with climate challenges. From introducing **desalination plants** to **modernizing its ports**, Taiwan has developed numerous projects that can serve as illustrative examples for SIDS. Abroad, Taiwan has already made significant impacts in the agriculture, fisheries, and **water** sectors of several Caribbean nations. Its experience undertaking development projects in these nations is likely to increase the efficiency and effectiveness of new climate adaptation projects in the region, as Taiwan has existing relationships with relevant **government institutions** and **other stakeholders**.

Taiwan's comparative advantages align closely with the Caribbean's most urgent adaptation gaps. Effective cooperation should prioritize sectors where technological innovation, institutional strengthening, and long-term partnerships can generate high social and economic returns. In the following sections, this paper will discuss how climate-smart agriculture, water resilience, and disaster preparedness are key sectors in which Taiwan's experience can be especially helpful to Caribbean nations. Not only does Taiwan have expertise gained from working in these countries in the past, but its background working on these issues domestically also means it has the institutional knowledge necessary to make an impact. Successful partnerships in these areas will improve food and water security and help mitigate the effects of climate change in the region, helping Caribbean SIDS stave off an existential threat.

CLIMATE-SMART AGRICULTURE AND FOOD SECURITY

Agriculture remains one of the most **climate-sensitive sectors** in Caribbean SIDS, with declining yields, rising input costs, and growing pest and disease pressures undermining rural livelihoods and food security. Taiwan's agricultural sector deals with similar climate difficulties and has built agricultural infrastructure in ways that could easily translate to the Caribbean context. Taiwan's experience in developing drought- and pest-resistant **crop varieties**, **precision irrigation systems**, and **farmer training services** is highly relevant to the challenges that Caribbean SIDS face. Taiwan has deep expertise in reforming all areas of its agricultural sector—from modifying seeds to upgrading machinery and cultivation techniques—in order to make its small landmass as productive as possible. These strategies could be uniquely helpful for Caribbean SIDS, at both the policy-planning level and the farmer-implementation level. In fact, Taiwan has already spearheaded projects of this sort throughout the region. Through TaiwanICDF, Taiwan has supported climate-resilient agriculture in partner countries by **integrating** improved crop genetics, **on-farm water management**, and **farmer training programs**. These approaches can continue to help Caribbean states reduce dependence on food imports, stabilize rural incomes, and improve resilience to droughts and rainfall variability. The effects of such programs make a difference not only in an agricultural context, but also in an environmental and economic sense.

WATER RESILIENCE

Water scarcity is a dire constraint on economic development, public health, tourism, and agriculture across much of the Caribbean. **Saltwater intrusion**, the inability of **aquifers** to recharge, and limited **storage infrastructure** have intensified drought-related vulnerabilities in recent years. A lack of water resilience has cross-sectoral impacts, weakening Caribbean states' abilities to improve their agricultural output or develop industries that require water as an input. On a social level, water scarcity has **negative effects** on gender equality, household nutrition, and educational attainment.

Taiwan's experience in desalination, smart water management, and integrated watershed planning offers practical solutions. A combination of physical infrastructure and institutional knowledge, dispersed between different government entities and the private sector, gives Taiwan the ability to provide end-to-end support to shore up water resilience in the region. One example of such assistance has recently come to fruition in Saint Kitts and Nevis. Taiwan-supported desalination and monitoring projects in the country have dramatically **transformed** the water sector, demonstrating how technology transfers can strengthen resilience when paired with institutional capacity building.

EARLY WARNING SYSTEMS AND DISASTER PREPAREDNESS

Early warning systems represent one of the highest-return adaptation investments in SIDS—yet they remain underdeveloped in much of the Caribbean. Taiwan's **disaster management model** emphasizes high-frequency meteorological data, impact-based forecasting, and community-level alert systems. These tools are directly transferable to Caribbean contexts and can significantly reduce disaster-related mortality and economic losses, while protecting the tourism industry that comprises such a large part of these nations' economies.

Some examples of tangible projects where Taiwan's expertise could make an impact for Caribbean climate adaptation include hydrometeorological monitoring equipment, forecasting platforms, digital hazard mapping and landslide sensors, and communication systems for rural communities. Again, both technology and implementation act as constraints in the Caribbean context. While donations of the relevant sensors and other equipment are necessary, training for technicians can ensure that new technology is operated properly and efficiently, so that communities across Caribbean SIDS receive reliable communications regarding disasters.

Below are some specific recommendations for cooperation between Caribbean states and Taiwan. For these states, development assistance for climate adaptation, coupled with Taiwan's experience in these sectors, would be especially relevant.

RECOMMENDATIONS FOR COOPERATION ON CLIMATE ADAPTATION

CLIMATE DATA AND DISASTER PREPAREDNESS

A practical entry point for Taiwan is Saint Lucia, a country striving to enhance climate data and emergency systems. For example, Taiwan could leverage its strengths in **digital governance** and **disaster risk analytics** to help Saint Lucia develop an online climate information portal and strengthen climate services for key users (farmers, public utility providers, and emergency management). In addition, Taiwan could help Saint Lucia develop training for government officials on how to implement digital tools and climate data in their work. An employee of a government agriculture or environment department that is trained in using climate tools can more effectively make predictions, write budgets, and draft policy proposals. This is an area where Taiwan is specifically equipped to help; its experience managing typhoons and extreme rainfall events has led its meteorological services to increasingly **integrate** advanced modeling tools.

Saint Vincent and the Grenadines' **National Adaptation Plan** (NAP) stresses the importance of resource mobilization, monitoring, and institutional strengthening to sustain adaptation action. Taiwan could add value by embedding climate finance "project pipeline" support within its technical cooperation: helping government ministries translate sectoral priorities into fundable concept notes, strengthening results frameworks, and building monitoring and evaluation routines that match donor standards while staying country owned. This is an area where Taiwan's assistance could be especially catalytic because it could improve the Saint Vincent government's ability to attract larger pools of climate finance beyond bilateral support without losing alignment with the NAP.

Beyond physical infrastructure, the **Saint Kitts and Nevis National Climate Change Adaptation Strategy** highlights the need for information management, research, and monitoring as cross-cutting objectives to inform climate adaptation decisionmaking. Taiwan could support this by helping Saint Kitts and Nevis build practical climate risk decision tools for water and infrastructure operators: drought indicators linked to demand management triggers, monitoring dashboards for key assets, and standardized risk-screening methods for new investments. This could be complemented with technical exchanges that would leverage expertise built through Taiwan's strengthening of its own water resilience, which could help inform regulation, operating standards, and contingency planning. inform regulation, operating standards, and contingency planning.

Saint Kitts and Nevis' strategy also calls for integrated adaptation and disaster risk reduction to protect lives and property. Taiwan could provide targeted support to disaster preparedness efforts through improved hazard monitoring and forecasting workflows, last-mile risk communication practices, and training on how to operationalize early warning information for local authorities. Taiwan's **extensive** typhoon preparedness experience and its ongoing modernization of forecasting practices can be translated into capacity-building packages for small island emergency management that focus on actionable warnings, not just data collection.

Belize's National Climate Change Policy, Strategy and Action Plan emphasizes strengthening risk information, improving monitoring capacity, and ensuring that climate data are systematically **integrated** into planning and emergency response. This reflects the country's high exposure to hurricanes, flooding, drought, and coastal hazards, all of which require more robust forecasting and communication systems to reduce economic losses and protect vulnerable communities. Taiwan could support Belize in this area by leveraging its extensive experience **in climate data management**, impact-based forecasting, and **early warning practices**. Taiwan's disaster management approach is characterized by integrated meteorological monitoring, high-frequency data collection, and **digital hazard-mapping systems** that help authorities translate forecasts into operational decisions during extreme weather events. These capabilities could be adapted to Belize's context through cooperation on hydrometeorological data platforms, decision-support tools for infrastructure and land-use planning, and training programs for national disaster agencies and local authorities.

Additionally, Taiwan has completed projects in climate-resilient agriculture and water management in Belize and other Caribbean states that could serve as examples for scaling climate data across sectors. For example, TaiwanICDF-supported agricultural projects have provided hands-on **training** for farmers and introduced agricultural practices specifically designed for local climates, demonstrating how environmental data can make a tangible difference for farmers and rural communities. Building on these experiences, Taiwan could help Belize develop an integrated climate information system that enables stakeholders in all relevant sectors to access climate data. The completion of such a system would allow farmers to see drought outlooks, enable water management employees to see flood risk, and deliver early warning notices to coastal populations. Such cooperation would directly advance Belize's adaptation priorities by strengthening preparedness, reducing disaster losses, and improving long-term planning.

AGRICULTURE

In the agricultural sector, **Saint Lucia's National Adaptation Plan** (NAP) highlights priorities such as strengthening research and development for climate-resilient agriculture, expanding access to climate-resilient varieties of crops and local inputs (including organic fertilizers and natural pesticides), and improving agrometeorological monitoring and emergency planning. Taiwan is well positioned to support these priorities because TaiwanICDF has already implemented a concrete agriculture initiative in Saint Lucia: the **Banana Productivity Improvement Project**, which focused on drainage and farm infrastructure, improved varieties, farmer training, and precision irrigation demonstration fields. Taiwan can scale this model beyond bananas into a broader climate-smart agriculture package that includes (1) irrigation scheduling and water-saving cultivation; (2) climate-resilient varietal trials and seed systems; and (3) farm-level advisory services that connect seasonal climate outlooks to planting and pest-management decisions. Improvements in these areas would directly match the NAP's goals for resilient crop production and improved climate risk preparedness in agriculture.

Taiwan could most immediately align with Saint Vincent and the Grenadines' NAP through climate-smart agriculture, building on active TaiwanICDF programming. In 2025, TaiwanICDF launched (and is currently implementing) the

Agricultural Productivity Recovery and Young Farmers' Training Project, which centers on a teaching and demonstration facility and explicitly introduces Taiwan's strengths in smart agriculture, vertical farming, water-saving cultivation technologies, and advanced environmental control equipment, while building youth skills and market channels. This project could be positioned as the nucleus of a broader NAP-aligned adaptation package. This could include expanding water-efficient production systems for drought-prone periods, developing resilient crop calendars and advisory services tied to climate information, and integrating post-harvest handling and value-chain upgrading to reduce climate-related income volatility.

Belize is another country that has identified **climate-smart agriculture** as a priority. The country's agriculture adaptation strategy was developed specifically to improve preparedness for worsening climate events and to identify tools and methods to support agriculture. Taiwan could help Belize realize that agenda through irrigation systems, drought- and heat-resilient crops, and farmer training programs. Taiwan has a **long history** of agricultural cooperation with Belize, and the Taiwan Technical Mission in Belize has **collaborated** with Belize's Ministry of Agriculture on a number of projects. Given Belize's emphasis on making agriculture more resilient to climate shocks, Taiwan could support new projects focused on water efficiency, climate-resilient seeds, and bringing agricultural technology to farmers. For example, connecting farmers to seasonal forecasts so they can make better-informed irrigation and pest-management decisions is just one way Taiwan's technical expertise could be of use.

WATER SECURITY

Saint Lucia's NAP calls for strengthening water sector resilience, including improving hydrometeorological monitoring and emergency planning to manage droughts and other extreme weather events. Taiwan could support Saint Lucia by pairing monitoring tools such as rain gauges, stream gauges, and watershed sensors with operational protocols for utilities and disaster agencies. This combination of tools and institutional knowledge would be a meaningful contribution to Saint Lucia's fight against drought, landslides, and flooding. In parallel, Taiwan could support climate-resilient infrastructure planning by offering technical assistance to help local public and private sector actors better assess risk and make the right infrastructure investments.

Taiwan could respond to Saint Vincent and the Grenadines' water stress realities by supporting a personalized tool kit that blends climate-resilient rainwater harvesting upgrades (for example, storage, filtration, and maintenance systems) with modular desalination solutions that are designed for high operating reliability and paired with local technician training. The NAP's description of desalination's existing role in the Grenadines makes this a realistic and politically salient pathway. Taiwan could draw on its own prior **desalination experience** in the Caribbean to shape financing, staffing, and maintenance plans that reduce long-run operational risks.

Taiwan's strongest near-term alignment with Saint Kitts and Nevis is water security, where TaiwanICDF is already financing and supporting construction of the **Basseterre Desalination Plant** under the Smart Water Supply Project. TaiwanICDF **reports** that the project introduces energy-efficient reverse osmosis with a production capacity of 2 million imperial gallons (around 9,000 tons) per day, intended to diversify water sources and strengthen resilience amid declining rainfall and climate-driven water stress. This investment directly operationalizes the water priorities of the country's strategy, and Taiwan could further increase its adaptation impact by bundling the plant with complementary measures that are also emphasized in the strategy (water efficiency, leakage management, and utility governance improvements) so that added supply is matched by reduced losses and more reliable distribution.

In Belize, a particularly strong sectoral match is flood risk management and early warning systems. Belize's national climate framework identifies **water** and **disaster resilience** as core priorities, and TaiwanICDF has already demonstrated that it can add value in these spaces. Through the **Belize Urban Resilience and Disaster Prevention Project**, TaiwanICDF helped Belize use geographic information system-based tools to establish an early warning system, improve flood preparedness, and strengthen disaster response. Taiwan later expanded this work through the **Flood Warning Capacity Improvement for the Belize River Basin Project**, which focuses on updating disaster maps, monitoring technologies, and strengthening response capacity in flood-prone areas of the Belize River basin. Taiwan could build on this foundation by helping Belize move from pilot warning systems to a more integrated national hydrometeorological and risk communication architecture, including last-mile alerts, floodplain mapping for infrastructure planning, and training for

local emergency managers. That would align closely with Belize's adaptation priorities while drawing on Taiwan's broader domestic experience in the use of high-frequency weather monitoring and digital decision tools to manage typhoons, floods, and other compound climate risks.

CROSS-CUTTING RECOMMENDATIONS FOR CLIMATE ADAPTATION COOPERATION

NATIONAL STRATEGY ALIGNMENT

Several cross-cutting lessons emerge from Taiwan's engagement in the Caribbean. First, adaptation programs are most effective when they are country led rather than donor driven. Projects aligned with national development priorities are more likely to achieve long-term sustainability. Institutional coordination between departments dealing with climate change, wildlife, water, economic development, and finance should be deepened so that foreign aid and outside investment can be more efficiently used to ensure greater impact. This can be done through national protocols that specifically detail how local and outside investment will be coordinated across departments and what types of adaptation projects will be prioritized. Such plans should include project pipelines that align with national needs rather than donor preferences, taking into account what industries are important for development and sustainable growth.

TECHNOLOGY TRANSFERS

Second, technology transfers must be paired with sustained capacity building. Infrastructure investments without adequate training, maintenance systems, and institutional support tend to deteriorate rapidly.

Embedding reliable and modern technology in local infrastructure will ensure that Caribbean states have the capacity to deal with climate issues for decades to come, building local capacity that many states now lack.

Technology transfers are perhaps the most powerful tool at Taiwan's disposal in its climate adaptation endeavors in the Caribbean. Embedding reliable and modern technology in local infrastructure will ensure that Caribbean states have the capacity to deal with climate issues for decades to come, building local capacity that many states now lack.

LONG-TERM PARTNERSHIPS

Multiyear partnerships allow for teams to collaborate more deeply and for more extensive projects to be completed, while short-term projects often fail to produce durable outcomes. Taiwan's long diplomatic and development presence in the Caribbean gives it the ability to develop and execute projects more quickly and effectively.

Taiwan's domestic achievements in climate sustainability and history in the region make it well suited for continued partnerships with Caribbean SIDS. Taiwan has the technical expertise and on-the-ground experience to develop long-term innovative projects in agriculture, water security, and disaster preparedness. Through lasting partnerships focused on alignment with individual national adaptation plans, Taiwan can help Caribbean partners translate climate strategies into measurable resilience gains.

REGIONAL COOPERATION

Finally, regional approaches can enhance scale and efficiency, particularly in early warning systems and technical training. However, such initiatives should aim to preserve equity among participating countries and avoid concentrating benefits in only a few states.

Taiwan has the background and expertise to be a leader in climate change adaptation practices that will make a difference for Caribbean states. Through its technical expertise, Taiwan can develop projects that have high social impact without requiring large human and monetary investments. Well-designed Taiwan-Caribbean cooperation can simultaneously strengthen climate resilience, reinforce diplomatic partnerships, and contribute to stability and sustainable development in the Western Hemisphere. ■

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