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Special Edition: 03

President

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WATER SECURITY IN THE BAHAMAS: CHALLENGES, INITIATIVES, AND GLOBAL CONTEXT

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Small Island Developing States (SIDS) like The Bahamas face unique water security challenges shaped by geography and climate. Many SIDS have limited freshwater resources, often relying on rainfall and shallow aquifers vulnerable to drought and saltwater intrusion (United Nations, 2023). The Bahamas, for example, has no freshwater rivers or lakes; its fresh water comes mainly from rain-fed groundwater, making it a water-scarce country heavily dependent on erratic rainfall (Green Climate Fund, 2022). Rising sea levels and over-extraction of groundwater exacerbate this scarcity by allowing seawater to contaminate aquifers (Bahamas Ministry of Environment and Natural Resources, 2023).

As a result, saline intrusion is a growing threat—a reality brought into sharp relief after Hurricane Dorian (2019), when storm surge flooded wellfields and left tap water in parts of Grand Bahama tasting of salt (NEMA, 2020). Climate projections indicate further declines in average annual rainfall and more variable precipitation patterns, which could lead to more frequent or prolonged droughts and intensified aquifer salinization (Bahamas Water & Sewerage Corporation, 2024). These vulnerabilities are common across Caribbean SIDS, which rank among the most water-stressed countries globally despite being surrounded by oceans (UNESCO, 2023).

This case study of Dorian highlights that climate-induced disasters can cripple essential services in SIDS, making water a central focus of resilience planning (UNDRR, 2023).

PUBLIC HEALTH, FOOD SECURITY, AND WATER QUALITY

Access to clean water and adequate sanitation (the core of SDG 6: Clean Water and Sanitation) is fundamental to public health in The Bahamas. Safe drinking water and proper sewage systems prevent waterborne diseases and other health issues (WHO, 2023).

Water security also intersects with food security in The Bahamas. Agriculture is a small but strategically important sector, including poultry, livestock, and crop farming, all of which need reliable water. Periods of drought have directly translated into lower crop yields and higher reliance on imported food (FAO, 2024). With climate change expected to introduce longer dry spells, irrigation needs are rising for the handful of islands that support farming. The government, with FAO support, has encouraged rainwater harvesting and more efficient irrigation techniques to help farmers cope with water scarcity (Bahamas Agricultural and Industrial Corporation, 2023).

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WATER AND THE ENERGY-RENEWABLES NEXUS

Water security in The Bahamas is closely tied to energy security and the push for renewable energy. Many solutions to water scarcity—such as desalination plants, well pumps, and wastewater treatment—are energy-intensive. In The Bahamas, desalinated seawater is a major source of drinking water, particularly in New Providence and some Family Islands, but it comes at a high cost (IDB, 2024). The country's electricity rates are among the highest in the region, largely due to an almost total reliance on imported fuel oil for power generation (Bahamas National Energy Policy, 2023). Any spike in oil prices can thus directly inflate water utility costs and, eventually, consumer water bills (IDB, 2024). Conversely, improvements in energy efficiency or shifts to cheaper energy would relieve some pressure on water costs.

Recognizing this, The Bahamas is aiming to integrate renewable energy into its water infrastructure. Solar photovoltaic (PV) systems are being installed at some water pumping stations and wellfields to offset electricity use (Bahamas Ministry of Works, 2024). There is also active exploration of solar-powered desalination units—essentially using abundant sunshine to provide freshwater from the sea. This aligns with the national target of 30% renewable energy penetration by 2030, as outlined in the Bahamas National Energy Policy (2023).

ACKNOWLEDGMENT OF GOVERNMENT INITIATIVES

The Government of The Bahamas has made remarkable strides in addressing water security challenges through strategic investments, policy frameworks, and proactive disaster preparedness. The $100 million agreement with the Inter-American Development Bank (IDB) is a transformative initiative that will modernize water infrastructure, expand access, and enhance efficiency, directly benefiting thousands of Bahamians. Additionally, the commitment to integrating renewable energy into water supply systems—such as solar-powered desalination—demonstrates forward-thinking leadership in sustainability. Furthermore, agencies like the National Emergency Management Agency (NEMA) and the Royal Bahamas Defence Force (RBDF) have played a critical role in disaster response, not only by providing logistical support but also by ensuring the swift deployment of water purification systems and emergency supplies to affected areas. Their efforts in coordinating humanitarian aid, securing critical infrastructure, and facilitating water distribution have been instrumental in maintaining stability during times of crisis., ensuring that communities receive clean water in times of crisis. These efforts reflect a national commitment to resilience, sustainability, and improved quality of life for all citizens.

INTERNATIONAL COLLABORATION AND RECENT INITIATIVES

The Bahamas is actively collaborating with international partners to improve its water security. A landmark development is the agreement with the Inter-American Development Bank (IDB) to finance major upgrades in water infrastructure. In February 2025, Prime Minister Philip "Brave" Davis and IDB President Ilan Goldfajn signed a $100 million loan agreement aimed at enhancing the Water & Sewerage Corporation's coverage, efficiency, and service quality (IDB, 2025). This investment is expected to benefit over 200,000 Bahamians by expanding access to potable water and improving sanitation services.

The IDB funding is part of a broader strategy to modernize The Bahamas' water management through initiatives such as smart water meters, advanced leak detection systems, and improvements to wastewater

treatment plants. These advancements align with global best practices in sustainable water resource management.

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ADVANCEMENTS IN WATER MANAGEMENT AND TECHNOLOGY

To confront its water challenges, The Bahamas is embracing the latest advancements in water management, including smart technology and data-driven tools. One major focus is on reducing water losses and improving operational efficiency through digitization. The Water & Sewerage Corporation (WSC) deploys smart water meters and advanced metering infrastructure (AMI) across New Providence and the Family Islands. These digital meters allow for remote readings in real time, more accurate billing, and quicker leak detection when abnormal usage patterns are detected.

Another leap forward is the incorporation of Artificial Intelligence (AI) in water monitoring. In late 2023, the WSC unveiled a pilot AI-driven leak detection program using acoustic sensors and machine learning algorithms. These small AI devices "listen" for leak signatures, analyze vibration patterns, and alert maintenance teams before leaks become visible, significantly reducing water loss and repair costs.

Disaster preparedness is another area benefiting from technology. The Bahamas is exploring IoT-based flood sensors for wellfields and treatment plants, enabling instant alerts if facilities are inundated. Additionally, drones have been deployed to survey flooded areas and assess damage to water lines after hurricanes, expediting restoration efforts.

BUILDING RESILIENCE: ROLE OF BMMA AND SSRI IN CAPACITY BUILDING

Addressing these multifaceted water issues requires not just infrastructure but also knowledge, research, and skilled personnel. The Bahamas Military and Maritime Academy (BMMA), along with its Security & Sustainability Research Institute (SSRI), is emerging as a key player in developing water resilience strategies and training the workforce needed for a more secure future. BMMA's establishment is a strategic response to evolving global challenges, linking education directly to national resilience and security (BMMA, 2025).

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