



## **THE GOVERNMENT OF THE BAHAMAS**

### **INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC) UNDER THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)**

Communicated to the UNFCCC November, 2015

The Bahamas is pleased to communicate its Intended Nationally Determined contribution and the accompanying information to facilitate clarity, transparency and understanding under decisions 1/CP.19 and 1/CP.20 adopted by the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC).

### **Introduction**

The Bahamas, since becoming a sovereign independent small island developing state, has made tremendous strides in providing universal access to education, potable water supplies, telecommunications, electricity, transportation and health care to its citizenry across its entire Commonwealth of islands.

The passage of hurricane Joaquin, a powerful category 4 storm, devastated the south central Bahamas in October, 2015. Hurricanes and the intensity of this hurricane, in particular, highlights the vulnerability of our country. Joaquin caused extensive damage requiring the need to rebuild the power and telecommunications grids on several islands, repair docks and roadways, homes, schools and medical facilities. An initial estimate of the cost to replace damaged or compromised infrastructure, that affected five to ten thousand persons carries a cost exceeding eighty million Bahamian dollars (80 MB\$), not including the cost of climate change considerations in any redevelopment.

The adverse impacts of climate change is exacerbated by our geographical (limited land masses, low-relief and dispersion of islands) and environmental (high temperatures, storm surges, sea level rise, flooding, tropical cyclones and non-tropical processes) vulnerabilities. The need to provide services across many islands requires the building of schools, clinics, roadways, airports, docks, power, water and telecommunications grids the entire archipelago. Joaquin impacted all infrastructure on the Islands of San Salvador, Rum Cay, Acklins and Crooked Islands and Long Island.

The concentration of socioeconomic activities, critical infrastructure in narrow coastal zones, dependence on tourism and limited human and institutional capacity are all factors that make The Bahamas vulnerable to climate change. The Bahamas' collective efforts to respond to the climate challenge has been realized largely through the use of national resources. In a similar manner efforts to achieve the Millennium Development Goals (MDG) have come with limited or no support from the international community.

This document presents The Bahamas' initial Intended Nationally Determined Contribution (INDC) in accordance with Decisions 1/CP.19 and 1/CP.20, of the United Nations Framework Convention on Climate Change (UNFCCC), which invites Parties to communicate their INDCs to the Secretariat towards achieving the objective of the UNFCCC as set out in Article 2 of the Convention.

## **National Circumstances**

The Bahamas consists of an archipelago of 700 islands and more than 200 cays, islets and rocks in the western Atlantic Ocean. The archipelago covers approximately 100,000 square miles ( $\text{mi}^2$ ) of ocean between latitudes 21° and 27° North and longitudes 72° and 79° West with a total land area of only 5,382  $\text{mi}^2$  (13,940  $\text{km}^2$ ). Much of the land is a few metres above mean sea level and the highest point is only 206 feet (63 m) above mean sea level.

Some 80% of the Commonwealth of The Bahamas is within three (3) feet (or approximately one (1) meter) of mean sea level and the hydrological records indicate that sea level has risen over the past century by one (1) foot (or 0.3 meters). Since 1992, hurricanes and tropical storms have caused significant monetary loss and irreparable environmental damage to the archipelago.



The economy of The Bahamas is mainly based on tourism and financial services sectors, with tourism being the major contributor to GDP and foreign exchange earnings. The banking and finance sector accounts for approximately 15% of GDP. The Bahamas has one of the world's fastest growing ship registries, with nearly 1,600 registered vessels. There is a small, growing industrial sector with Grand Bahama having several industries and crude oil storage facilities for trans-shipment. The island of New Providence, where Nassau, the capital is located, is home to brewing, distilling and light manufacturing. The agriculture and fisheries sectors accounts for 3% to 5% of GDP.

The World Bank statistics shows The Bahamas' contribution to the total global greenhouse gas emissions as almost negligible at some 0.01% of global emissions. The significant sources of Green House Gas (GHG) emission come from the energy and transport sectors. Using any proportional measure of GHG intensity to economic activity, the Bahamas, based on its archipelagic nature, dispersed rural population and the makeup of its services based economy has a higher ratio than other comparable industrialized economy.

A rapid transition to the use of reverse osmosis, in response to rising sea level salinization of fresh ground water lenses has resulted in an increased dependence on processed water to meet the needs of a tourism and services dependent economy. Accordingly, responding to the impact of climate change and an increased use of fossil fuels has resulted in a dependence on imported technologies.

Based on available scientific facts, we can expect more frequent and intense impacts over time. It is within this context that The Bahamas, which is highly dependent upon the import of fossil fuel for energy and transportation, is expected to adapt to the impacts of climate change and adopt a low carbon strategy that conforms to international and public pressure to reduce its "carbon footprint," exposure to climate change, increase energy security and reduce the heavy burden of global petroleum prices on our economy.

In response to the challenges faced by climate change, The Bahamas has developed a National Climate Adaptation Policy (2006), a National Energy Policy (2013) and amended its Forestry Act (2014). Under preparation is a pilot project in Harbour Island to test and demonstrate ways of transitioning to a low carbon and climate resilient development pathway in a small Family Island community which is almost entirely dependent on tourism.

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The developmental policy imperative of the Commonwealth of The Bahamas is to provide for the sustainable development needs of a small young population dispersed over some 100,000 square miles that requires access to modern energy service, to potable water and the provision of a transportation system to service a tourism and services based economy.

## **Mitigation**

Considering that The Bahamas is a tourism-based economy with expected climate change impacts, it is imperative for the country to implement climate change mitigation policies that will reduce climate change impacts and mitigate GHG emissions. The Government of The Bahamas has recognized the importance of addressing climate change both from a mitigation and adaptation perspective.

As a signatory of the UNFCCC, The Bahamas is committed to being a responsible member of the global community that makes efforts to achieve the ultimate objective of the Convention given our national capacities and respective capabilities. The Bahamas intends to achieve its mitigation contribution through an economy-wide reduction GHG emission of 30% when compared to its Business as Usual (BAU) scenario by 2030.

The electricity and transport sectors are the main usage sectors of fossil fuels in the country, and electricity demand is expected to increase in the medium term. Accordingly, the Government has defined the policy framework for a low carbon development plan through the National Energy Policy, that sets a national target to achieve a minimum of 30% renewables in the energy mix by 2030, and will allow for a 10% Residential Energy Self Generation Programme within the year.

It is envisaged that emission reduction contributions will be achieved through the mitigation actions in the sectors, which accounted for the vast majority of GHG emissions in the Bahamas in 2000. This overall target is contingent on several factors including, but not limited to, access to the required technologies, energy efficiency and energy conservation measures appropriate across an archipelagic nation with utility, small utility and residential applications appropriate in a tropical country frequented by tropical processes. Based on previous efforts, our ability to meet this target assumes economic growth and socio economic progress and cost savings warranting the required expenditures.

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This comprehensive programme to improve efficiency and energy diversification will allow The Bahamas to provide reliable, high-quality, affordable, environmentally-friendly energy, while at the same time reducing the volumes and amounts of imported fuels. Energy diversification will involve moving from a high dependence on petroleum to increased contributions of other sources like renewable energy from solar, ocean and wind as appropriate based on local site specific conditions. Indeed, The Bahamas is well positioned to tap local renewable energy resources such as wind and sun but lacks the required access to resources and means to provide for the security of services and replacement of assets from losses and damages from extreme events. In the transport and energy sectors, energy efficiency improvements, energy conservation fuel switching and the deployment of as yet unavailable fuel cell technologies are envisaged as they mature and are made commercially available to further assist in the attainment of this conditional sector wide objective.

The transport sector has its own particular challenges based on the need to address road and marine transportation alternatives in urban and rural settings, conscious of the cradle to grave deployment of technologies that are neither manufactured nor developed within our borders. The environmental impacts of imported technologies in vehicles and for power supplies also require adequate consideration.

Through efforts to develop and attract research activities in the Bahamas, Public Private Partners augmented by limited government funding and guarantees, The Bahamas hopes to focus efforts on the development of indigenous renewable energy resources in the achievement of its national goal for renewable energy.

The development and diffusion of renewable energy resources and technologies will help The Bahamas, and other non-oil producing nations, to realize important economic, environmental and social objectives. Renewable resources such as wind, solar, waste-to-energy and biomass are indigenous to the country. If developed adequately, they can provide cleaner, more affordable alternatives to fossil fuels for a low carbon development in the long term. This will not only lower the country's oil bill, but improve energy security through diversification of the energy base. Increased use of renewable energy will also lessen environmental

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impacts, reduce the country's carbon footprint and its contribution to global GHG emissions.

Efforts under The Forestry Act, which was amended to allow for the establishment of a permanent forest estate, 20% of which is designated into either one of three categories (forest reserves, protected forests and conservation forests), will be subject to a management plan to ensure efficient and focussed strategy and environmental conservation. It is envisaged that the establishment of the National Forest Estate will deliver global environmental benefits along with domestic livelihood support and development and seek to safeguard future land degradation on the Pine Forest Islands. Enhanced management will improve our forest ecosystems, the ridge to reef linkages to protect corals, sea grasses important to sustainable livelihood and the functionality of our mangrove ecosystems increasing their carbon sink ability. Improved harvesting practices will reduce the vulnerabilities of our forest ecosystems to climate change and human-induced impacts. GHG emission reductions from land degradation and deforestation has the potential to increase carbon sequestration of some approximately 5,661,077tCO<sub>2</sub>eq across several pine islands in the Bahamas.

### **Assumptions and methodological approaches Mitigation**

Methodology for emissions counting	The IPCC Revised 1996 Guidelines for National Greenhouse Gas Inventories and the Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories were used to calculate the GHG emissions and removals as described in the Second National Communication to the UNFCCC. Emissions of carbon dioxide from the combustion of biomass are assessed, but not counted towards the contribution.
Global warming potentials (GWP)	The carbon dioxide equivalent was calculated using the 100 year global warming potentials in accordance with the IPCC 2 <sup>nd</sup> Assessment Report.

## **Adaptation**

Recognising that mitigation alone will not protect us from the negative effects associated with a changing climate, The Bahamas has expanded its adaptation focus. The Bahamas Second National Communications recognises that mitigation will not protect us from the negative effects associated with a changing climate and expands on the initial National communication through the development of The Bahamas SimClim model combined with the evidence of climate change as evident in the hydro-meteorological records.

Near shore marine environments play an integral role in the protection of critical infrastructure across the archipelago. On this basis, The Bahamas acts not only under the UNFCCC but also the United Nations Conventions on Biological Diversity (CBD), and Convention to Combat Desertification (UNCCD) and other relevant multilateral and regional environmental agreements (MEAs) and initiatives. As an example, in 2008, as a part of the CBD Programme of Work on Protected Areas (POWPA) and a new initiative across the Caribbean, The Bahamas, committed itself to Caribbean Challenge Initiative (CCI). This initiative builds on the work undertaken under the CBD to provide for the protection of 20% of our near shore marine environment by 2020. This year we have achieved half of our goal.

These protected areas will conserve and protect habitats for Grouper and Bonefish spawning aggregations, coral reefs, sea grass meadows, mangrove nurseries and important migratory bird areas. Additionally, the Forestry Act has for the first time in The Bahamas protects designated Mangrove and mangrove ecosystem and important Biological and ecosystem services impacted by sea level rise. In so doing, The Bahamas has undertaken measures in the short, medium, and long-term to increase the resilience of terrestrial ecosystems, including soil conservation, agro-forestry and the establishment of special conservation, protected and management areas. These efforts have been supported financially through project funding provided by the Global Environment Facility.

The larger CCI regional initiative is envisaged to require further significant technical and financial resources to implement the 2020 objective. The Bahamas is actively engaged in the CCI with public, business and private sectors and the NGO community.



The following table represents some of the key sectors for which adaptation options are proposed for implementation which have a climate change abatement or resilience building implications.

Most of the examples provided are unsupported and undertaken via national resources with a focus on the urban sector, primary economic activity and main population centres across The Commonwealth. This said, due to the loss of potable freshwater resources, as a result of climate change, many rural sectors are now supplied by reverse osmosis facilities for safe potable water services, including residential and tourism sectors. The increased cost of these services is borne through public subvention. All indications are the use of reverse osmosis facilities and increased use of waste water treatment facilities will increase dramatically due to the combined effects of climate change. The Bahamas would require support and access to the appropriate technologies to transition its water and sewerage infrastructure over time.

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## **Some examples of Vulnerable Sectors and Adaptation Options planned or being undertaken**

<b>Sector</b>	<b>Adaptation Options</b>
Agriculture, livestock development and fisheries	Formulate and implement strategies and measures that will help to enhance food security and sustainable food production.
Tourism	Work with stakeholders in the tourism sector to develop a strategic plan, which incorporates Climate Change considerations and appropriate measures such as water conservation programmes, as well as, general sustainability concerns.
Health and wellbeing	Inform, sensitize and educate health personnel and the public-at-large about Climate Change related health matters including but not limited to heat stress, vector borne diseases and impacts on the vulnerable sub sector of society. Ensure that national emergency management planning also include heat stress, the impacts of vectors on human settlements and wellbeing.
Human Settlement, including housing, design of critical infrastructure, roads, bridges, air and sea ports	Develop a comprehensive National Land Use and Management Plan, which inter alia, incorporates Climate Change concerns and regulates the location of future settlements and urban developments without compromising water supply and other such requisites for sustainability. Establishing environmental guidelines for heights of infrastructure relative to mean sea level, incorporate climate change considerations in public building, and improving the building code to provide for stronger wind loads.
Water Resources management including and water supply services sewage and potable water systems	Incorporate Climate Change concerns including “worse case” scenarios of sea level rise, saltwater intrusion, flooding and storm surges leading to inundation of well fields, and the need to regulate water supplies to the different sectors (domestic, tourism, agriculture and industry). Provide for water reserves, the safe disposal of wastewater effluent and minimization of outflows into the marine environment by conserving wetlands and near and far shore marine ecosystems including mangroves.

## **Information to Facilitate Clarity, Transparency & Understanding**

Time frame and or Period for Implementation	2020-2030
Type of Commitment	GHG/Goal target (economy-wide or sectoral contribution)
Reference year	2000
Scope of gases included in the contribution	Carbon dioxide, Methane and Nitrous Oxide
Sectors covered by the contribution	Energy sector and Forestry
Intention to use market-based mechanisms to meet contribution	The Government of The Bahamas is willing to explore the potential benefits of market mechanisms and other mechanisms under the UNFCCC process, with a regional approach, that equitably benefit Caribbean countries; that demonstrate environmental integrity, result in real, permanent, additional, verified mitigation outcomes and prevent double counting. The Bahamas unfortunately even though being a signatory to the Kyoto Protocol has limited experience with existing market mechanisms.

## **Fairness and ambition**

### Fairness

It is important to The Bahamas that in order to meet the below 1.5 or 2°C objective, each Party must undertake mitigation actions based on the principle of common but differentiated responsibilities and respective capabilities in accordance with the Convention.



### Ambition

As a small island developing state the provision of essential service to residents and economic activity drives our ambition. We have significant investments to protect having achieved universal access to potable water, education, health services and critical transportation systems across the archipelago. Using national resources, The Bahamas has taken steps to preserve its way of life and at the same time recognize an obligation to present and as yet unborn citizens to take steps to reduce our national GHG emissions, increase energy security and contribute to a global low carbon pathway while seeking to develop sustainably.

### Means of Implementation

The Bahamas has set a target of 30 percent emissions reductions, below 2010 levels by 2030. Efforts so far have been unsupported by the international community.

The Bahamas has not undertaken a comprehensive assessment of the cost related to the implementation of the INDC, the cost of actions taken in the water sector to adapt to sea level rise nor the provision for increased resilience of critical infrastructure.

The detailed LEAP scenario described in our SNC, provides assumptions for projected development in the energy sector and possible response strategies but have not costed them. In a similar vein one, albeit untested, attempt was made for the Forestry sector on three main pine islands with an estimated cost in excess of sixty three million dollars to implement mitigation actions in 2030. No attempt has been made to extrapolate these numbers over the entire archipelago.

The cost for implementation is anticipated to be met through multilateral and bilateral support from a variety of sources, instruments and on varying access terms. The Bahamas' upper middle income status complicates these considerations as the international community employs only one criteria for access to grant and concessional financing. The Bahamas is therefore not eligible for access to the resources of the World Bank and its climate financing mechanisms.

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The Bahamas subject to the availability of technical expertise and financial resources will undertake a more detailed cost analysis to determine the cost to implement actions to address mitigation and adaptation.

## **Additional information**

The Bahamas INDC builds on the participatory multi-stakeholder and cross sectoral consultative processes undertaken during the development of its Initial and Second National Communications to the UNFCCC, its National Energy Policy and through efforts undertaken to provide capacity enhancement.

The national communication processes focuses on vulnerability and adaptation assessments as well as the formulation of a mitigation assessment using the Long Range Energy Alternatives Planning (LEAP) model for the Commonwealth of the Bahamas.

The INDC must be considered along with the essential background information provided in the Bahamas Second National Communication. Further detailed information which supports this INDC can be found in the Bahamas' Initial and Second National Communications to the UNFCCC.

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