



BELIZE

Nationally Determined Contribution under the United Nations Framework Convention on Climate Change

Belize is pleased to present its Nationally Determined Contribution (NDC) pursuant to decision 1 CP/21 of the Paris Agreement

1. National Context

Climate Change is already affecting the livelihoods of much of our population. Belize as a small country with relatively minor contributions to global greenhouse gas emissions has limited capacity to contribute to mitigation of global climate change. However, Belize is committed to achieving the ultimate objective of the Convention and supports the even more ambitious target to limit the increase in global average temperature to 1.5°C, compared to pre-industrial levels. In light of these realities, Belize's Nationally Determined Contribution (NDC) is guided by its commitment to strategically transition to low carbon development while strengthening its resilience to the effects of Climate Change.

In that regard, Belize intends to utilize existing frameworks, policies, projects and activities that provide mitigation and sustainable development co-benefits to conceptualize the elaboration of its NDC.

The NDC for Belize is consistent with the overall goal of the Growth and Sustainable Development Strategy (GSDS) which encompasses medium-term economic development, poverty reduction, and longer-term sustainable development. The GSDS is the nation's primary planning document and outlines four critical success factors for the development of our country and to ensure a better quality of life for all Belizeans, living now and in the future.

Belize is pleased to submit its Nationally Determined Contribution (NDC) which is comprised of a mitigation and adaptation component.

2. Belize's Mitigation Potential

Belize's mitigation potential will largely depend upon national circumstances, capacity and support.

Belize's emissions profile is symptomatic of several factors including:

1. Vast extent of natural resources – Belize has a network of waterways and water bodies including 16 watersheds and numerous smaller ones. Approximately 59 percent of the country remains under natural vegetation while 39.1% of the terrestrial area is made up of protected forests, and a great variety of terrestrial, marine and freshwater ecosystems¹;
2. Socio-economic dependence on those resources for livelihood and for sustaining economic growth particularly through the agriculture and tourism sectors;
3. A rapidly growing and urbanizing population (with over a third in poverty and a largely unskilled labor force);
4. Concomitantly increasing energy demands.

Belize has developed several policy frameworks over the last decade to respond to these issues. These include: (1) Horizon 2010-2030, (2) National Energy Policy Framework, (3) Sustainable Energy Action Plan 2014-2033, (4) National Climate Resilience Investment Plan 2013, (5) Growth and Sustainable Development Strategy 2016-2019 and (6) the National Climate Change Policy, Strategy and Action Plan 2015-2020.

Horizon 2030 is the national development framework; which was developed after extensive stakeholder consultation inclusive of all political parties. One of its four main pillars is responsible environmental stewardship. The strategies to achieve this pillar, namely integrating environmental sustainability into development planning and promoting sustainable energy for all, address the areas of concern relating to Belize's emission profile.

The National Energy Policy Framework aims to provide options that Belize can pursue for energy efficiency, sustainability and resilience over the next 30 years. Additionally, the Sustainable Energy Action Plan is a tool to achieve Belize's renewable energy and energy efficiency potential while meeting the Government's economic social and environmental goals. It provides a framework of actions and tasks to overcome barriers to sustainable energy for the period 2014-2030.

The National Climate Resilience Investment Plan, 2013 provides the framework for an efficient, productive and strategic approach to building economic and social resilience and development. Special importance is given to building climate resilience and improving disaster risk management capacities across all sectors.

The Growth and Sustainable Development Strategy is the guiding development plan for the period 2016–2019. It adopts an integrated, systemic approach and encompasses medium-term economic development, poverty reduction and longer-term sustainable development issues. This planning document also provides detailed guidance on priorities and on specific actions to be taken during the planning period, including actions that contribute to longer term development objectives beyond 2019.

The National Climate Change Policy, Strategy and Action Plan (NCCPSAP), 2015-2020, provides policy guidance for the development of an appropriate administrative and legislative framework, in harmony with other sectoral policies, for the pursuance of a low-carbon development path for Belize. In addition, the NCCPSAP also seeks to encourage the development of the country's Nationally Determined Contribution (NDC) and to communicate it to the UNFCCC.

Belize has also developed a roadmap for the development of a low carbon development strategy which will create a platform for low carbon growth in new areas while still attaining the national development targets. The roadmap compliments the NCCPSAP and GSDS by focusing on building technical capacity, strengthening institutions and policies, facilitating public-private partnerships and engaging stakeholders to adopt sustainable practices which should lead to national resilience to the impacts of climate change.

The National Solid Waste Management Policy (NSWMP) is the main public policy instrument regarding the management of solid waste (e.g. municipal, industrial and hazardous types of waste, among others) for Belize. Its overall goal is to ensure that “The system for managing solid wastes in Belize is financially and environmentally sustainable, and contributes to improved quality of life”, while also contributing to the promotion of sustainable development by preventing, re-using, recycling or recovering waste wherever feasible and beneficial. The measures outlined in the NSWMP will be implemented in accordance with the National Solid Waste Management Strategy and Implementation plan which have also been prepared.

3. Mitigation

Belize mitigation potential is framed on an action-based approach, covering multiple sectors, (e.g. forestry, electricity, waste and transport) that is ~~conditional~~ on the availability of cost effective technology, capacity building and ~~adequate~~ financial support.



Activity	Description	Objective	Anticipated emission reduction
Reserves and sustainable forest management	This activity is expected to reduce emissions from land use and forestry from the 2015 estimate of 3,300Gg CO ₂ down to zero emissions sometime in the future and could turn the sector into a sink. This activity is also a key building block of adaptation which is being put into practice in key biodiversity areas in Belize.	Reduced deforestation, increased resilience of human communities, and sustainable forest management. Watershed protection for water and food security.	Belize would potentially reduce greenhouse gas emissions by cumulative 410.5Gg CO ₂ per year by 2030. The cumulative reduction would be up to 2,477Gg CO ₂ over the period from 2020 to 2030, depending on the level of financial support.
Fuel wood consumption	Emissions savings potential of efficient cook stoves comes from a reduction of wood used for the same result.	Aim is to achieve a reduction of fuel wood consumption by 27%-66%, depending on the technology, the duration of cooking and the replacement technology.	The anticipated emission reductions would be between 2.1Gg CO ₂ per year in 2020 and 12.4Gg CO ₂ by 2030. Expected cumulative reduction would be up to 118Gg CO ₂ between 2020 and 2030 (depending on population growth).
Mangroves	Protecting and restoring mangrove forests. This activity can be an effective mitigation action while also helping the protection of low-lying coastal areas against impact of storms and soil erosion. Mangrove forests also fulfill	Protection of existing mangroves from deforestation and restore lost mangroves.	Restoration and protection have the potential to turn Belize's mangrove system into a net carbon sink by avoiding current emissions of around 11.2Gg CO ₂ per year and removing additional 2.2 – 35Gg CO ₂ per year between 2020 and

	critical role as nursery ground for regional fish stocks and maritime ecosystems.		2030. The expected cumulative emissions reduction would be up to 379Gg CO ₂ between 2015 and 2030.
Transport Sector	Development of a domestic transportation policy and implement the National Transportation Master Plan.	Aim is to achieve at least a 20% reduction in conventional transportation fuel use by 2030 and promote energy efficiency in the transport sector through appropriate policies and investments.	
Sustainable Energy Strategy and Action Plan	To improve energy efficiency and conservation in order to transform to a low carbon economy by 2033. The plan envisions a reduction in energy intensity per capita at least by 30% by 2033 and to reduce fuels imports dependency by 50% by 2020 using renewable energy.	<p>85% renewable energy by 2030 by implementing hydropower, solar, wind and biomass, and reduction of transmission and distribution losses.</p> <p>Reduction in transmission and distribution losses from 12% to 7% by 2030 resulting in electricity savings.</p>	<p>Expected cumulative reduction in emissions through hydropower projects by 2,514Gg CO₂ until 2030 or 168Gg CO₂ per year.</p> <p>Expected cumulative reduction in emission by enhancement of the grid infrastructure would be in the range of 160-273Gg CO₂e until 2030.</p> <p>Expected cumulative reduction in emissions from solar PV projects would be around 518Gg CO₂ until 2030.</p> <p>Cumulative reduction in emissions from bagasse would be 947Gg CO₂ by 2030.</p>

<p>National Solid Waste Management Strategy and Plan</p>	<p>Implementation of the Solid Waste Management strategy and plan.</p> <p>Its overall goal is to assist the Government of Belize (GoB) in promoting sustainable development by ensuring that “The system for managing solid wastes in Belize is financially and environmentally sustainable, and contributes to improved quality of life”. It will focus on preventing, re-using, recycling or recovering waste wherever feasible and beneficial and disposing of waste safely only as a last resort. The plan also aims to reduce methane emissions by capping and closing open dumps, capturing and utilizing landfill gas, and ensuring proper waste handling and organics management.</p>	<p>Strengthening of the Solid Waste Management Authority as the entity responsible for improving solid waste management in the country. Improved waste management processes in line with waste management strategy implemented nationwide.</p> <p>To mitigate the effect of methane on climate change, prevent water and air pollution. It will also contribute to improving the environment; enhance the image of Belize in eco-tourism market and protecting the public health.</p>	
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Information to Facilitate Clarity, Transparency and Understanding

Decision 1 CP/20 paragraph 11 states that “small island developing states may communicate information on strategies, plans and actions for low greenhouse gas emission development...”

Belize considers that the upfront information provided addresses sectors with significant contribution to Belize's greenhouse gas emissions and satisfies the requirement of clarity, transparency, and understanding of the aggregate effect of contributions to the achievement of the 1.5 degree C goal.

Action	<p>Protection of forest reserves and sustainable forest management</p> <p>Reduction of fuel wood consumption - by 27% - 66%,</p> <p>Protecting and restoring mangrove forests.</p> <p>Sustainable Energy Strategy and Action Plan - 85% renewable energy by 2030 by implementing hydropower, solar, wind and biomass, and reduction of transmission and distribution losses.</p> <p>Transport Sector - Develop Transport Policy and Implement Transport Master Plan.</p> <p>The National Solid Waste Management Policy (NSWMP) - Develop and Implementation of the Strategy and Plan to operationalize the NSWMP.</p>
Time frames and/or periods of implementation	
Timeframe for implementation:	2015 - 2030
Scope and coverage	
Scope of gases included in the contribution	Carbon dioxide (CO₂) (Fossil fuels, Electricity and Forest sectors) Methane - Waste Sector
Sectors/sources covered by contribution	Electricity, Transport, Forest and Waste sectors
Geographical coverage:	The NDC contribution will be national.

Assumptions and methodological approaches	
Methodology for emissions accounting	<p>The methodology for emissions accounting is as follows:</p> <p>Mitigation potentials are relative to projected baseline emissions on the sectorial level, taking into account current emissions, expected population growth and economic development.</p> <p>Electricity sector: The methodology for the identification of mitigation measures in the electricity generation sector is based on two main scenarios using the National Energy Policy Framework and Belize Sustainable Energy Strategy and Action Plan.</p> <p>These scenarios are as follows: i) energy efficiency scenario which estimate the effects of reducing the losses of electricity in the transmission and distribution system, and ii) renewable electricity generation scenario which estimate the effects of enhancing renewable electricity generation within the generation mix.</p> <p>Transport: Methodology for emissions accounting to be developed as part of the Transport Policy and Transport Master Plan. In doing so, internationally recognized and used tools and methods will be considered. Information on emissions not available.</p> <p>Waste: Methodology for emissions accounting to be developed as part of the Strategy and Plan to operationalize the NSWMP. Information on emissions not available.</p>
Global warming potentials (GWP)	100 year global warming potential in accordance with IPCC AR 4 guidelines.
Approach for land use, land use change and forestry	<p>Emissions from LULUCF included.</p> <p>Baseline emissions are estimated using average biomass stock between FAO and REDD+ data. Baseline emissions expected to decrease from 3,350Gg CO₂ in 2015 to 3,020Gg in 2030.</p>
Intention to Use Market Mechanisms	Belize is willing to explore the potential of market mechanisms, including CDM and other mechanisms under the UNFCCC process, that demonstrate environmental integrity; result in real, long-term, verified mitigation outcomes; prevent double counting; and which are accessible.
Base year	2015
Conditionality	Each activity is geared to address the sectors with significant contributions to Belize's greenhouse gas emissions. These activities listed in the NDC are conditional upon external (financial) support.
Unconditional	Enabling the existing policies, laws and projects, staff time and integration of development and climate change activities.

Fairness and Ambition

Belize is classified as a Small Island Developing State, which contributes **less than 0.01 percent to the global emissions** and accounts for a small share of past and current greenhouse gas emissions. Yet, Belize recognizes that to meet the 1.5 degree temperature goal, all countries will need to undertake ambitious mitigation actions. Belize remains committed to strategically transition to a low carbon and climate resilient future; while also providing a fair contribution to the global efforts at reducing average global air temperature to 1.5 degree Celsius above pre-industrial levels.

4. Adaptation

Belize's Vulnerability to Climate Change

The Government of Belize considers adaptation to climate change as a high priority. In addition to its vulnerability to natural disasters and climate-related shocks, Belize's small and open economy, geographical location and the lack of vital resources constrain its capacity to adapt to the effects of climate change and variability in the short and long term.

According to the recent systematic country diagnostic by the World Bank Group, Belize is one of countries in the world that is mostly affected by weather related events and other natural hazards. As such, Belize incurs annual losses of close to 4% of GDP due to natural disasters (Carneiro, 2016).

According to the UNDP Country Profiles studies, an increase in air temperature ranging from 2°C - 4°C is projected by 2100 for Belize. Similar results were obtained from the Regional PRECIS model at 25 km resolution. Likewise a general decrease in annual rainfall of about 10% is projected by 2100. Other expected impacts include increased erosion and contamination of coastal areas, sea level rise, flooding and an increase in the intensity and occurrence of natural hazards such as hurricanes. Many of the effects of climate change are already being felt on the low lying coastal zone and are expected to have significant impacts on many environmental, physical, social and economic systems in Belize.

In the agriculture sector, Belize expects a projected loss of production within the range of 10% to 20% which could lead to million dollars in lost revenue by the year 2100 (UNDP, 2009. Belize and Climate: The Cost of Inaction). The fisheries sector is also under threat from warmer sea surface temperatures, ocean acidification, sea-level rise, and extreme weather events. A decline in this industry can significantly affect Belize's food security as well as our GDP. It would also affect over 3,500 licensed fishers, which could lead to an annual loss of approximately USD 12.5 million per year.

The tourism industry in Belize, which is largely nature based and dependent on natural resources, will primarily be affected by extreme weather events, flooding, inundation, salt water intrusion and erosion which will occur as a result of rising sea levels. Climate Change will threaten the health of Belize's coral reefs and will affect water supplies and physical property, all of which are critical for the sustainability of the sector. The combined effects of reduced tourism demand, loss of infrastructure, loss of beaches and the loss of the barrier reef can result in the reduced income of approximately USD 24.2 million per year.

Addressing Climate Change: Policies, Plans and Programmes

The Government of Belize has noted that, if these issues are not addressed, climate change will be considered as the single major threat to food and nutrition security, employment and economic prosperity and will obliterate many attainments that have been made towards achieving sustained development within the country.

The NCCO is about to embark on development of the Fourth National Communication to the UNFCCC which will address gaps and produce updated information on climate trends and projected impacts. To guide the adaptation process, six sectoral vulnerability and adaptation assessments were completed under the Third National Communication to determine the country's vulnerability profile and to identify possible adaptation options. The Integrated Vulnerability and Adaptation Assessment of Belize (Singh, et. al. 2014), made several cross-linkages between the impending impacts of climate change on six priority development sectors; namely, coastal development, agriculture, water, tourism, fisheries and health; further highlighting Belize's extreme vulnerability. Building on the vulnerability and adaptation assessments, several key national and sectoral policies, strategies and action plans were developed and/or updated to incorporate climate change in an effort to enhance Belize's resilience.

A core objective of the NCCPSAP is the building of resilience in order to prevent, reduce or adapt to the negative impacts of Climate Change on key sectors, economic activities, society and the environment. The policy specifically recognized the negative effects on the social, economic and productive sectors such as the coastal zone and human settlement, fisheries and aquaculture, agriculture, forestry, tourism, water, energy and health; the physical environment including land, and infrastructure, such as roads and coastal structures; as well as the sustainability of natural resources such as marine and coastal areas, natural ecosystems, and biodiversity.

In this regard, the policy is being implemented with the goal of guiding the short and long term processes of adaptation in accordance with national priorities and regional and international commitments. The policy aims to continue the mainstreaming process by facilitating the integration of climate change initiatives into national development plans and sectoral policies in order to facilitate an integrated, well-coordinated, approach to climate change management and sustainable development.

Near Term Adaptation Actions and Co-benefits

Recognizing the devastating effects that climate change poses for the people and country of Belize, the NCCPSAP proposes the implementation of various actions which are geared towards promoting adaptation in the short term and resilience in the longer term. Thus, strategies and actions have been prioritized for each sector to be implemented within the period of 2015 to 2020. The sectors of focus are agriculture, forestry, fisheries and aquaculture, coastal and marine resources, water resources, land use and human settlements, human health, energy, tourism and transportation.

The stated actions are geared towards diversifying production, maintaining healthy ecosystems, encouraging sustainable exploitation of resources, supporting integrated development planning, assessing and addressing vulnerabilities and the development of tools to drive efficiency and promote resilience. As such, the action plan calls for, inter alia, the reviewing of national strategies and regulations, designing monitoring and evaluation frameworks, improving mangrove and habitat conservation and management, institutional strengthening, integrated water resource management and the undertaking of comprehensive assessments on human settlements and infrastructure.

It is also recognized that many mitigation actions will produce co-benefits that promote adaptation and resilience to climate change. Forest protection and replanting of mangroves that are implemented for mitigation purposes are expected to protect the coastline against storm surges and erosion; which are increasing in frequency as a result of climate change. Likewise, many of the proposed actions in the waste, transport and electricity sectors are expected to produce additional adaptation co-benefits such as reduced water and air pollution, energy security, improved energy access, employment creation, and ecosystem protection; all of which lead to increase resilience to climate change.

Institutional Arrangements

Climate Change is noted to be a complex issue which needs appropriate responses to ensure that mainstreaming is carried out in a coordinated manner. In this regard, the Government of Belize has sought to establish a coherent, overarching governance structure to coordinate climate change management initiatives at the national level.

This was accomplished with the establishment of the National Climate Change Office as a national entity which is committed towards the implementation of the NCCPSAP. To this end, the Office is strategically positioned to coordinate the implementation of climate change adaptation and mitigation actions and to implement climate change programmes. Additionally, the Belize National Climate Change Committee (BNCCC) was established as a broad based multi-stakeholder committee comprised of non-state, public and private sector representatives. The BNCCC provides overarching leadership and guidance to all climate change management actions and to review and

advise government on the capacity building, institutional and other resource requirements needed to fully implement the strategy and action plan.

Also most recently (April, 2016), the GSDS has been launched, and includes actions with climate change implications, such as continued mainstreaming of climate change considerations into national development planning and coordinated implementation of the NCCPSAP within the wider planning efforts.

Moving towards the longer-term adaptation goal, the main actions up to and beyond 2030 are geared towards increasing resilience and reducing vulnerability of livelihoods with respect to critical infrastructure, tourism, food security, sustainable forest management, protected areas management, coastal and marine resources, water scarcity, energy security and health.

<i>Priority sectors</i>	<i>Main actions to be implemented to build resilience</i>
Coastal and Marine Resources	Increase and strengthen the capacity of the CZMAI and municipal authorities to ensure developments within the coastal and urban areas of Belize include an adaptation strategy; implement mangrove restoration or sea and river defense structure to prevent coastal and riverine erosion and ecosystem disruption; manage and regulate further development of the coastline, especially in vulnerable areas such as the Belize and Corozal Districts; inclusion of adaptation strategies in management and development planning in all coastal and marine sectors; review and strengthen planning legislation and building codes, especially as it relates to coastal development; revise and streamline the current legislation and policies that relate to the management and regulation of development in the coastal zone to eliminate overlaps and close existing gaps.
Agriculture	Improve both crop and livestock husbandry practices, increase access to drought tolerant crops and livestock breeds; adopt better soil and water management practices; reduce post-harvest losses and provide early warning/meteorological forecasts and related information to be competitive in the region.
Water Resources	Design and implement an IWRM programme in watersheds; enhance protection of water catchment (including groundwater resources); develop water conservancy management systems; conduct water resource assessment (especially groundwater); develop flood controls and drought monitoring; improve trans-boundary cooperation regarding water resources; strengthen the human resource capacity in the water sector strengthen the compliance monitoring capacity of staff; undertake water policy reform.

Tourism	Identify and assess coastal tourism areas in Belize that are vulnerable to Climate Change and provide support to coastal planners and policy makers in selecting appropriate policies and adaptation strategies that meet climate adaptation, developmental and environmental goals. Mainstream Climate Change in the Tourism Master Plan for Belize, to support Adaptation Measures, especially on the Coastline, but also to further promote Environmental and Responsible Tourism Best Practices.
Fisheries and Aquaculture	Adopt the new Fisheries Resources Bill and subsidiary regulations; revise and adopt mangrove regulations and EIA regulations; support mangrove and fisheries conservation and management plans to protect wetlands and sea grass beds; monitor compliance with EIA regulation requirements for coastal mangroves alterations.
Human Health	Undertake a climate change vulnerability and capacity assessment for the health sector; improve the capture, management and monitoring of diseases and vectors affected; increase human resource capacity and improve efficiency; develop education awareness program to educate population on adaptation measures; improve disease control and prevention; promote investment in health infrastructure.
Forestry	Maintain and restore healthy forest ecosystems by sustainable forest management, increasing afforestation and reforestation in order to increase the resilience of human communities.

5. Statement of Gaps, Barriers and Needs

Capacity Building, Education and Awareness - Public communication is an integral element of the GSDS. The program of action component of the GSDS contains provisions for education, awareness and training. To support economic growth, sustainable development and resiliency, the GSDS recognizes the need to develop adequate skills and capacities via the implementation of the Education Sector Strategy 2011-2016, at all educational levels and institutions. With an emphasis on education and training, the GSDS also proposes the alignment of education and training to current labour market needs. Furthermore, the GSDS will develop programs to educate and provide employment opportunities to at-risk youth.

Capacity building efforts around adaptation planning is a priority. In addition, resource needs are expected to be significant over the period used to implement the adaptation actions that are specified in the NCCPSAP. Some specific climate change adaptation needs in the sector plans include the need to educate different stakeholder groups about climate change adaptation measures and to help them develop capacity to

research, develop and implement adaptation strategies. Some institutions have recognized the need to shift from general public awareness and education to a community based approach for environmental education programmes, which would address specific issues and concerns. These needs all tie in with the critical success factor 3 of the GSDS for “Sustained or improved health of natural, environmental, historical and cultural assets”.

Research and Monitoring - Climate action depends on the availability of high-quality scientific information. Climate data, science, information, and knowledge are critical elements in all facets of development under a changing climate. Many government sectoral plans and strategies have express the need for research and monitoring related to climate change adaptation and mitigation but they lack the human and financial resources to fully undertake this task. The way forward will include innovative approaches in partnerships between the University, local agencies and overseas research institutions. Additionally, initiatives such as mangrove restoration and protection offer new opportunities in scientific field study to assess the carbon storage capacity of mangrove ecosystems, known as the Blue Economy.

Technology - The GSDS encourages technology development and transfer, the building of institutional capacities and developing intelligence frameworks to support technology adoption and innovation, including green technologies. Technology for diversifying fossil fuels for renewable energy, or protecting critical infrastructure is prohibitively expensive. To address these challenges, alliances with overseas partners including donors need to be continued. There is also insufficient technological capacity to undertake effective research on climate change modelling and risks, monitoring of climate change impacts and implementation of adaptation measures.

Coordination / Legislation - The mitigation and adaptation strategies and actions outlined earlier are cross sectoral and multidisciplinary in nature and will therefore require a coherent approach to implementation. This is currently a barrier as the responsibility for implementation falls within various ministries and government departments. While there is increased knowledge and appreciation for the need to implement these measures, several ministries still consider climate change an environmental issue and not a priority. The way forward is to adopt the recommendation to elevate the NCCO to a Climate Change Department fully responsible for coordinating all relevant mitigation and adaptation policies, strategies, plans and programmes across various sectors and Government Ministries. Legislation may need to be reviewed and amended and adequate financial resources sourced.

Finance - Financial resources, for example, international climate finance, private sector and public sector finance will be required to implement the Climate Action Plan (mitigation and adaptation). Mitigation cost is estimated at reducing at around USD 10 million (excluding the cost of reducing transmission & distribution losses and co-benefits from renewable energy) in NPV, using a 5% discount rate. Mitigation cost to reduce emissions from transmission& distribution is estimated at USD 16-23 million

of reduced electricity expenditures over 2015-2030. Mitigation cost to implement hydropower projects would be around USD 58 million (in NPV terms) and bagasse power plant would cost USD 39 million (in NPV terms). Mitigation cost for Solar PV projects in net present value would cost USD 45 million over the period 2015-2030.

Financial costs relating to adaptation are contained in the section on additional information.

6. Planning process

Belize intends to support the delivery of its NDC through the implementation of the comprehensive National Climate Change Policy, Strategy and Action Plan. The plan incorporates the following elements:

- Sectoral action plans covering all of the activities summarized above, led by the respective line ministries;
- Synergies with the Growth and Sustainable Development Strategy;
- The Belize National Climate Change Committee, which is supported by the National Climate Change Office, to facilitate the coordination of climate change activities on behalf of the Government of Belize;
- Implementing the National Roadmap to achieve a Low Carbon Development Strategy;
- A proposed Monitoring, Reporting and Verification System (to be developed and implemented), encompassing greenhouse gas inventory, sustainable development impacts, NAMA monitoring reporting and verification framework, adaptation M&E framework and climate finance tracking system;
- Supporting initiatives on stakeholder engagement and capacity building.

7. Means of implementation

Belize's NDC includes both an unconditional and conditional contribution. The unconditional contribution will be given by enabling existing policies, laws and projects, the provision of staff and the integration of development and climate change activities. The conditional contribution assumes that international support will be needed.

The implementation costs of mitigation actions are yet to be determined. Some rough cost estimates for Energy sector mitigation actions are also included in the technical report, but they are indeed preliminary and need further refinement to make projects bankable.

8. Monitoring and Evaluation

Monitoring and evaluation is considered to be crucial for the effective and efficient implementation of climate change adaptation activities at the national level. A monitoring and evaluation framework has been developed by the National Climate Change Office which lays out the components of the national climate change programme and describes how the stated activities will lead to the desired outcomes. The Belize National Climate Change Committee chaired by the Chief Executive Officer in the Ministry of Agriculture, Forestry, Fisheries, **the Environment, Sustainable Development and Climate Change** will function as the main body to monitor implementation of climate change adaptation programmes/projects, and identify emerging gaps and opportunities for further action.

9. Additional information

Belize's Climate Change Action Plan

Belize's Climate Change Action Plan focuses on building the capacity and resilience of the country to meet the challenges of climate change. In Belize, like most SIDs, GHG emissions are relatively small, but international commitments as well as opportunities to benefit from associated mitigation initiatives (reduced deforestation and energy conservation) has prompted their inclusion in the development of the National Climate Change Policy Strategy and Action Plan. Agriculture, land-use change and the forestry sector are considered prime areas for climate change adaptation but are also known to be contributors to GHG emissions and will require the development of policy initiatives to reduce such threats. The energy and transportation sectors, because of the benefits to be derived through the pursuit of sustainable energy and low-carbon development initiatives, will also require policy initiatives which seek to limit emissions of GHGs. Belize identified the following **key sectors** for which **adaptation and mitigation strategy and action plans will be addressed**; these are:

- Agriculture
- Forestry
- Fisheries and Aquaculture
- Coastal and Marine Resources
- Water Resources

- Land use and Human Settlements
- Human Health
- Energy
- Tourism
- Transportation
- Solid Waste

Enhance Food Security and Sustainability: Agriculture is critical to Belize's development, given its importance both in terms of food self-sufficiency, employment, and being one of the country's major exports and earnings of foreign exchange. Belize has developed a National Agriculture Sector Adaptation Strategy to address climate change in Belize, in order to combat the detrimental effects of climate change. These recommendations include both short and long-term measures to address critical gaps in technological developments relevant to crop production, better soil management practices, diversification into drought resistant crops and livestock, and farm production adaptations which include, but is not limited to, land use, land topography and water management including use of low-water irrigation systems and water harvesting/storage. The estimated cost for planned activities totals approximately USD \$15,960,000.

Integrating Climate Change in Revised National Plan: Belize is well known for its pristine forests and is reported to have the highest forest cover in both Central America and the Caribbean (62% as a percentage of land, 37% of which are primary forests). However, the forests of Belize, like other natural resource sectors, are anticipated to be impacted by the various manifestations of climate change. The proposed interventions to mainstream adaptation and mitigation to climate change will be achieved by providing guidance for actions that concerns the direct and indirect threats posed by global climate change on forests and forest dependent people in order to reduce their vulnerability, increase their resilience and adaptation to climate change. The estimated cost for planned activities totals approximately USD \$5,158,000.

Sustainable Management of the Fisheries Sector: The fisheries sector is important to Belize because it is an important food source, provides an income and livelihood for several persons as well as an earner of important foreign exchange. Given the importance of the fisheries sector as a source of food and earner of foreign exchange, it is imperative that management measures are introduced to ensure its sustainability including addressing the threats of climate change. Interventions under the fisheries sector aim to achieve the sustainable management of the fisheries resources, and the

conservation and preservation of fisheries resources and marine habitats in promoting reef ecosystem resilience. Estimated cost is approximately USD\$ 500,000 annually.

Implementation of the Belize Integrated Coastal Zone Management Plan: The importance of the coastal zone in the productive sector of Belize is increasing rapidly. Most industries in Belize are either directly or indirectly reliant on some component of the coastal environment to function. Industries such as fishing and tourism are dependent on the organisms that inhabit the coastal area to sustain them. Other industries such as agriculture, aquaculture, and petroleum use the coastal waters to transport their products, thereby allowing them to engage in overseas trade. Rapid economic development, directly attributed to tourism and recreational activities and population growth, have led to increasing pressures on coastal and marine resources, with implications to the livelihoods of those that depend upon them. These anthropogenic threats are compounded by natural hazards, global warming and rising sea levels and the vulnerability of sensitive coastal ecological systems to climate change. It is therefore, imperative to ensure that the coastal zone is managed and utilized in a manner that will continue to support important ecological functions, as well as social, cultural and economic prosperity for current and future generations. The overall objective is to promote the adoption and implementation of the Belize Integrated Coastal Zone Management Plan which will ensure responsible and sustainable use of Belize's coastal and marine resources in the face of climate change. The cost of activities to promote the adoption and implementation of the Belize Integrated Coastal Zone Management Plan is estimated at approximately USD \$500,000 annually.

Improved Integrated Water Resource Management: Due to its geographic location, relatively high level of forest cover, and 18 different water catchment areas, Belize is recognized as having an adequate supply of freshwater. However, like other resource sectors, a number of anthropogenic factors (increases in demand due to expansion in the agricultural, industrial and tourism sectors, a growing population and accompanying water pollution and watershed destruction), together with impending threats of climate change, are placing a heavy strain on the sustainability of this resource. The overall goal is to enhance the protection and restoration of forest ecosystems and build the resiliency of water catchment areas. Activities to realize the goal are: Develop Regulations to complement the commencement of the National Integrated Water Resources Management ACT (2010); operationalization of the National Integrated Water Resources Authority (NIWRA); capacity building for the Hydrology Unit to transition to the Authority; develop a Water Vulnerability Profile to support the Water Master Plan; prepare a National Water Master Plan for the entire country; and, complete feasibility studies for a National Water Quality Laboratory.

Resources including estimated cost for the following planned activities will be around USD 1,500, 000.

Integrate Climate Change in the Tourism Sector: In Belize, like most other SIDS, most of the tourist assets are located within the narrow coastal belt and the growth of the industry is perceived as having a potential detrimental effect on the environmental resources on which it is dependent. The goal is to assess the vulnerability of Belize's tourism system to climate change and ensuring the mainstreaming of climate change considerations throughout the sector to enhance ecosystem resilience, equitable distribution of tourism activities and fostering of sustainable tourism development, at a local and national scale.

Building Resilience of Human Settlements: The strategy is to promote the adoption of an integrated land tenure and land classification policy and developing and implementing programmes which discourage the establishment of human settlements in areas prone to natural hazards (flooding, land slippages, high winds and storm surges), and develop housing and settlement patterns/practices that enhance climate change adaptation and are resilient to climate change. The resources including estimated cost for the following planned activities are yet to be determined.

Enhance Resiliency of Transportation Sector: Several of Belize's roads and bridges are vulnerable to seasonal floods. Belize's waterways also become un-navigable during certain periods. In the absence of a transport policy, it is imperative that a vulnerability assessment is undertaken with greater focus being placed on assessing the vulnerability of the transport infrastructure, particularly in urban areas and other areas which are critical in sustaining the country's productive sectors (tourism, agriculture and ports). An improved and energy efficient transport sector will not only reduce the country's vulnerability to storm surges and floods, but also assist in reducing GHG emission. The resources including estimated cost for the following planned activities are yet to be determined.

Strengthened and Improved Human Health: It is important that the Ministry of Health undertake a Vulnerability and Capacity Assessment for the health sector. This is important for the country to be well informed of the impacts of climate change on the health sector and the adoption of practices and technologies that will reduce exposure and health impacts from extreme heat, and improve physical infrastructure of health institutions and their functional capacity. The resources including estimated cost for the following planned activities are yet to be determined.

Improved Waste Management: Until a few years ago, the uncontrolled dumping and burning of garbage, as a form of final disposal throughout Belize, was quite common. Such practices, compounded by inadequate waste collection systems and the lack of technical and environmental controls have impact on the health of the population and pollution of the nearby ocean, thereby affecting coral reefs and affecting the livelihood of thousands of Belizeans whose livelihoods are directly and indirectly linked to fishing and eco-tourism. The overall goal is to implement a National Integrated Waste Management Programme including programmes to reduce, reuse, recover and recycle solid waste and reduce greenhouse gas emissions into the atmosphere.
