

**Brunei Darussalam**  
**Nationally Determined Contribution (NDC) 2020**

Brunei Darussalam is no exception to being impacted by the effects of climate change as the rest of the world - believing that the challenges posed by climate change demand urgent, decisive and concerted global action.

Brunei Darussalam hereby communicates its Nationally Determined Contribution (NDC) and relevant information to facilitate clarity, transparency and understanding in accordance to decision 1/CP.21, paragraph 27 as contained in Annex 1 of decision 4/CMA.1.

This NDC supersedes the INDC and has been developed in an inclusive Whole-of-Nation process through the instituted national climate change governance. It sets a new ambition level which includes an economy-wide 2030 NDC target based on clear climate mitigation, resilience and adaptation policies.

However, limitations resulted from the COVID-19 pandemic, have posed challenges in the preparation of this NDC, which may be updated in due course should there be new findings from further assessments.

**Brunei Darussalam is committed to a reduction in greenhouse gas (GHG) emissions by 20% relative to Business-As-Usual levels by 2030.**

Information to facilitate clarity, transparency and understanding of Brunei Darussalam's enhanced NDC	
<b>1. Quantified information on the reference point (including, as appropriate, a base year):</b>	
(a) Reference year(s), base year(s), reference period(s) or other starting point(s)	Base year: 2015
(b) Quantifiable information on the reference indicators, their values in the reference year(s), base year(s), reference period(s) or other starting point(s), and, as applicable, in the target year	Base year (2015) emission level: 11.6 Mt CO <sub>2</sub> e  Business-As-Usual (2030) emission level: approximately 29.5 Mt CO <sub>2</sub> e
(c) For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or policies and measures as components of nationally determined contributions where paragraph 1(b) above is not applicable, Parties to provide other relevant information	Not applicable.

(d) Target relative to the reference indicator, expressed numerically, for example in percentage or amount of reduction	Brunei Darussalam is committed to a reduction in GHG emissions by 20% relative to Business-As-Usual levels by 2030.
(e) Information on sources of data used in quantifying the reference point(s)	Reference indicator will be quantified based on national total GHG emissions in 2015.
(f) Information on the circumstances under which the Party may update the values of the reference indicators	The national total GHG emissions in 2015 may be recalculated and updated due to continuous methodological improvements.
<b>2. Time frames and/or period for implementation</b>	
(a) Time frame and/or period for implementation, including start and end date, consistent with any further relevant decision adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA);	1 January 2021 – 31 December 2030 (10-year period).
(b) Whether it is a single-year or multi-year target, as applicable.	Single-year target.
<b>3. Scope and coverage</b>	
(a) General description of the target;	Economy-wide total GHG emissions reduction relative to BAU levels by 2030.
(b) Sectors, gases, categories and pools covered by the nationally determined contribution, including, as applicable, consistent with IPCC guidelines;	GHG covered: Carbon dioxide (CO <sub>2</sub> ), Methane (CH <sub>4</sub> ) and Nitrous oxide (N <sub>2</sub> O).  Key sectors covered: Energy, Industrial Processes and Product Use, Agriculture, Forestry and Other Land Use, and Waste.
(c) How the Party has taken into consideration paragraphs 31(c) and (d) of decision 1/CP.21;	All categories of anthropogenic emissions and removals included.
(d) Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans, including description of specific projects, measures and initiatives of Parties' adaptation actions and/or economic diversification plans.	Not applicable.

#### 4. Planning process

(a) Information on the planning processes that the Party undertook to prepare its NDC and, if available, on the Party's implementation plans, including, as appropriate:

<p>i) Domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner;</p>	<p>Brunei Darussalam has established a multi-sectoral climate change institutional governance to ensure a Whole-of-Nation approach in addressing the challenges and opportunities of climate change at a national level.</p> <p>The climate change governance structure consists of the Brunei Darussalam National Council on Climate Change, Executive Committee on Climate Change, Mitigation Working Group, Adaptation and Resilience Working Group, and Support Framework Working Group.</p> <p>The Brunei Darussalam National Council on Climate Change comprises of four key ministers and a deputy minister and it is co-chaired by the Honourable Minister of Development and the Honourable Minister of Energy to provide the highest level of strategic direction in addressing climate change. The Executive Committee on Climate Change is composed of Permanent Secretaries of key government agencies, Chief Executive Officers and Managing Directors of industry operators, Presidents of professional associations, academia and non-governmental organisations to drive national climate mitigation, adaptation and support efforts.</p> <p>The Mitigation Working Group, Adaptation and Resilience Working Group, and Support Framework Working Group respectively consist of members from the private and public sectors, non-government organisations and academia institutions to execute climate action in each respective area.</p> <p>The varying levels of membership ensures a multi-sectoral collaborative process to approach climate change mitigation, adaptation, resilience and support.</p>
<p>ii) Contextual matters, including, inter alia, as appropriate:</p>	
<p>a) National circumstances, such as geography, climate, economy, sustainable development and poverty eradication;</p>	<p>Despite Brunei Darussalam's relatively small contribution to the global GHG emissions at around 0.025% in 2018, the Sultanate is affected by adverse impacts of climate change. The Government recognises the importance to present a fair and ambitious NDC while considering the country's national circumstances as a developing country, which include: an oil and natural gas economy; the prioritisation of forested areas; fossil fuel dependency; and vulnerability to a low carbon world. This is fully consistent with Article 3 paragraph 2 and Article 4 paragraph 8(h) and 10 of the United Nations Framework Convention on Climate Change.</p> <p>Brunei Darussalam continues to pursue policies that are in line with its national development plan, the <i>Wawasan Brunei 2035</i> (Brunei Vision 2035), which aims to make the Nation widely recognised for its educated and highly skilled people as</p>

	<p>measured by the highest international standards; achieving and maintaining quality of life among the top 10 nations in the world; and operating under a dynamic and sustainable economy with income per capita within the top 10 countries in the world. The priority of <i>Wawasan Brunei 2035</i> is to safeguard the welfare of Bruneian citizens, which includes plans to ensure a clean, green and healthy environment.</p> <p>The Government of Brunei Darussalam recognises the need for a more balanced economy by identifying growth areas in the country to promote the development of other sectors in addition to energy. These include the financial and service industries, which will diversify the economy to ensure future economic stability. Promoting sustainability within the current economy is also a priority for the Government of Brunei Darussalam. This approach is further re-enforced by strong “top-down” support from His Majesty the Sultan and Yang Di-Pertuan of Brunei Darussalam in many areas of the economy, and through “bottom-up” approaches to activities such as awareness raising on climate change in schools and communities.</p> <p>The Government of Brunei Darussalam will continue efforts to develop plans to address the adverse impacts of unusual and extreme weather and climate events.</p> <p>Brunei Darussalam will continue to pursue green growth for sustainability and resilience so as to achieve Brunei Darussalam’s national target whilst remaining economically dependent.</p>
<p>b) Best practices and experience related to the preparation of the nationally determined contribution;</p>	<p>In preparation for the NDC, extensive consultations and peer reviews have been conducted with relevant stakeholders. An NDC Workshop was organised in 2018, to give relevant stakeholders a more detailed understanding of the NDC process itself and to assist in the preparation of the NDC.</p> <p>Brunei Darussalam’s main priority in the preparation of the NDC is developing the Brunei Darussalam National Climate Change Policy (BNCCP) which was launched on 25 July 2020 that outlines the principles, values, and strategies needed to pave the way for low carbon and climate-resilient pathways for a sustainable nation. This BNCCP serves as the basis of Brunei Darussalam’s NDC.</p> <p>The BNCCP was developed using a Whole-of-Nation approach to strategically govern and monitor GHG emissions and strengthen climate-resilience. Towards this, ten core national strategies were identified. These strategies are to be achieved in line with <i>Wawasan Brunei 2035</i> and cover areas pertaining to industrial emissions, forest cover, electric vehicles, renewable energy, power management, carbon pricing, waste management, carbon inventory, climate resilience and adaptation, and climate awareness and education.</p>

	<p>A total of 39 agencies, consisting of government bodies, private sector agencies, research and academic institutions, and Non-Government Organisations (NGOs) were appointed as members of the BNCCP Drafting Committee.</p> <p>Further to that, a group of 51 youth representatives comprising of those between the ages of 25 to 40 were invited to review the BNCCP draft.</p> <p>The varying levels of participation and involvement ensures a multi-sectoral approach to climate change mitigation, adaptation and support.</p> <p>Youths and NGOs are regularly engaged in climate change dialogues with ministers and policymakers and for reviews of the BNCCP. Youths have an equally important role to play as the next generation inheriting the responsibility to protect the planet, in fighting the complex scientific problems, social quandaries and impacts presented by climate change. The Government of Brunei Darussalam continues to support youths towards becoming resilient to the challenges of climate change by enhancing their effective participation in climate policy decision-making processes for them to express their views and to contribute effectively to solutions to mitigate climate change.</p> <p>Brunei Darussalam continues to plan, discuss and implement climate action through the national climate change governance.</p>
<p>c) Other contextual aspirations and priorities acknowledged when joining the Paris Agreement;</p>	<p>None.</p>
<p>(b) Specific information applicable to Parties, including regional economic integration organizations and their member States, that have reached an agreement to act jointly under Article 4, paragraph 2, of the Paris Agreement, including the Parties that agreed to act jointly and the terms of the agreement, in accordance with Article 4, paragraphs 16–18, of the Paris Agreement;</p>	<p>Not applicable.</p>

(c) How the Party's preparation of its NDC has been informed by the outcomes of the global stocktake, in accordance with Article 4, paragraph 9, of the Paris Agreement;	The first global stocktake will take place in 2023. Brunei Darussalam participated in the Talanoa Dialogue in 2018, which generated political momentum for enhanced climate action including for Parties to inform their NDC by 2020. The preparation of Brunei Darussalam's NDC was informed by the recommendations of the Talanoa Call for Action, taking into consideration of Brunei Darussalam's national circumstances.	
(d) Each Party with an NDC under Article 4 of the Paris Agreement that consists of adaptation action and/or economic diversification plans resulting in mitigation co-benefits consistent with Article 4, paragraph 7, of the Paris Agreement to submit information on:	i) How the economic and social consequences of response measures have been considered in developing the NDC;	Not applicable.
	ii) Specific projects, measures and activities to be implemented to contribute to mitigation co-benefits, including information on adaptation plans that also yield mitigation co-benefits, which may cover, but are not limited to, key sectors, such as energy, resources, water resources, coastal resources, human settlements and urban planning, agriculture and forestry; and economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries.	Not applicable.
<b>5. Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals:</b>		
(a) Assumptions and methodological approaches used for accounting for anthropogenic greenhouse gas emissions and removals corresponding to the Party's nationally determined contribution, consistent with decision 1/CP.21, paragraph 31, and accounting guidance adopted by the CMA;	Brunei Darussalam refers the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories.  Tools used: <ul style="list-style-type: none"> <li>• 2006 IPCC Software</li> <li>• Long Range Energy Alternative Planning (LEAP)</li> <li>• Simple Econometric Simulation System</li> </ul>	

(b) Assumptions and methodological approaches used for accounting for the implementation of policies and measures or strategies in the nationally determined contribution;	A LEAP model was used to project BAU Scenario for energy sector, while the projection of GHG emissions was adopted using Massachusetts Institute of Technology (MIT) Global Change gap analysis methodology. ( <a href="https://globalchange.mit.edu/research/research-projects/pathways-paris">https://globalchange.mit.edu/research/research-projects/pathways-paris</a> ).	
(c) If applicable, information on how the Party will take into account existing methods and guidance under the Convention to account for anthropogenic emissions and removals, in accordance with Article 4, paragraph 14, of the Paris Agreement, as appropriate;	Not applicable.	
(d) IPCC methodologies and metrics used for estimating anthropogenic greenhouse gas emissions and removals;	<p>Brunei Darussalam’s GHG emissions will be estimated using 2006 IPCC Guidelines via Sectoral Approach. The Tier 1 methodology will be used for most emission estimates with exception of fugitive emissions from fuels where a hybrid of Tier 1 and Tier 3 methodology is used, where relevant depending on data availability.</p> <p>The aggregation of GHG emissions and removals will be reported using the 100-year time-horizon global warming potential (GWP) values from the IPCC Fifth Assessment Report.</p>	
(e) Sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, as appropriate, including, as applicable:	Forest land – land-based approach with reference level.	
	i) Approach to addressing emissions and subsequent removals from natural disturbances on managed lands;	Emissions and subsequent removals from natural disturbances on managed forest land are currently not included but Brunei Darussalam intends to include this if measurements in the field can be estimated, in accordance with the prescribed 2006 IPCC Guidelines.
ii) Approach used to account for emissions and removals from harvested wood products;	Brunei Darussalam uses ‘instantaneous oxidation’ as the default approach to account for emissions and removals from harvested wood products, according to the Good Practice Guidance for Land Use, Land-Use Change and Forestry (GPG-LULUCF) and the 2006 IPCC Guidelines.	

	iii) Approach used to address the effects of age-class structure in forests;	Not applicable.
(f) Other assumptions and methodological approaches used for understanding the nationally determined contribution and, if applicable, estimating corresponding emissions and removals, including:	i) How the reference indicators, baseline(s) and/or reference level(s), including, where applicable, sector-, category- or activity-specific reference levels, are constructed, including, for example, key parameters, assumptions, definitions, methodologies, data sources and models used;	Multiple workshops and stakeholder engagements have been carried out to obtain feedback on possible measures to reduce GHG emissions.
	ii) For Parties with nationally determined contributions that contain non-greenhouse-gas components, information on assumptions and methodological approaches used in relation to those components, as applicable;	Not applicable.
	iii) For climate forcers included in nationally determined contributions not covered by IPCC guidelines, information on how the climate forcers are estimated;	Not applicable.
	iv) Further technical information, as necessary;	Not applicable.
(g) The intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable.	Market mechanisms: Brunei Darussalam envisages to achieve the intended GHG emissions reductions under this NDC through domestic actions and financing. However, the Government of Brunei Darussalam will explore possible bilateral, regional and international mechanisms in meeting the NDC target.	
<b>6. How the Party considers that its NDC is fair and ambitious in light of its national circumstances</b>		
(a) How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances;	Brunei Darussalam considers that its NDC is fair and ambitious in light of its national circumstances through ambitious, but reasonable, ten core national strategies to reduce carbon emissions and strengthen climate-resilience nationwide as reflected in the BNCCP. Themed, "Towards a Low Carbon and Climate-Resilient Brunei Darussalam," the BNCCP encapsulates the aforementioned intentions in accordance with its aim to achieve <i>Wawasan Brunei 2035</i> , whilst	
(b) Fairness considerations, including reflecting on equity;		

(c) How the Party has addressed Article 4, paragraph 3, of the Paris Agreement;	safeguarding the welfare of the people and ensuring a clean, green and healthy environment for every citizen.
(d) How the Party has addressed Article 4, paragraph 4, of the Paris Agreement;	Brunei Darussalam's NDC has continued to enhance its mitigation efforts and moved towards economy-wide GHG emissions reduction in light of its national circumstances, which reflects its efforts as a developing country Party to address Article 4, paragraph 4, of the Paris Agreement.
(e) How the Party has addressed Article 4, paragraph 6, of the Paris Agreement.	Not applicable.
<b>7. How the NDC contributes towards achieving the objectives of the Convention as set out in its Article 2</b>	
(a) How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2;	Brunei Darussalam's target to reduce GHG emissions by 20% by 2030 from Business-as-Usual levels is in line with the objectives set out in Article 2 of the Convention.
(b) How the nationally determined contribution contributes towards Article 2, paragraph 1(a), and Article 4, paragraph 1, of the Paris Agreement.	<p>Brunei Darussalam's target to reduce GHG emissions by 20% by 2030 from Business-as-Usual levels is in line with the objectives of the Paris Agreement, and is aimed at achieving the long term-temperature goal set out in Article 2, paragraph 1(a), of the Paris Agreement.</p> <p>As a developing country, Brunei Darussalam will endeavour to limit the increase in GHG emissions in accordance to its national capacity and circumstances with so as to achieve a balance between anthropogenic emissions by sources and removal by sinks of GHG reflecting national circumstances.</p>

Accompanying information on Brunei Darussalam's Climate Mitigation and Climate Adaptation and Resilience Efforts, based on the Brunei Darussalam National Climate Change Policy (BNCCP).

## **1.0 Climate Mitigation**

Brunei Darussalam will be implementing measures that will mitigate the impact of climate change by introducing strategies to reduce GHG emissions:

### **1.1 BNCCP Strategy 1 on Industrial Emissions - Reduce overall emissions in the Industrial Sector.**

Brunei Darussalam aims to lower carbon intensity from the industries by attaining zero-routine flaring, as defined by the World Bank standard. The main focus for the BNCCP is to reduce industrial emissions in general by 2035. The significant reduction in total fugitive emissions, mainly venting and flaring will be attributed by a number of rejuvenation projects within the oil and gas industry facilities for GHG abatement, both onshore and offshore. The primary goal of this strategy is to achieve zero-routine flaring and reducing other industrial emissions by adopting the "As Low As Reasonably Possible" (ALARP) principle.

### **1.2 BNCCP Strategy 2 on Forest Cover - Increase carbon sink through afforestation and reforestation with a target of planting 500,000 new trees.**

Increasing Brunei Darussalam's forest cover would increase the national carbon sequestration potential, thus having positive effects on habitats, biodiversity and ecosystems. Brunei Darussalam is home to one of the most diverse and complex ecosystems in the world. Forest cover in the country constitutes to about 72.1% of land area or 380,000 hectares of land accounting for a carbon sequestration value of 11.4 Mt CO<sub>2e</sub>. Brunei Darussalam aims to increase its forest reserves from 41% to 55%. Current efforts seek to increase Brunei Darussalam's carbon sink through reforestation efforts. At present, 104,920 trees are identified for current reforestation efforts, and a further 400,000 trees are proposed leading up to 2035.

### **1.3 BNCCP Strategy 3 on Electric Vehicles - Increase total share of electric vehicles (EV) to 60% of the total annual vehicle sales by 2035.**

This strategy seeks to promote the ownership of EV through the consideration of various policy related issues such as, but not limited to, the following: price of fuel and electricity; low EV prices (e.g. through excise duty incentives); annual Vehicle License (VL) fees; and availability of infrastructures (e.g. charging stations). The establishment of the Electric Vehicle Joint Task Force (EVJTF) in 2019 consisting of relevant stakeholders will ensure the implementation of EV policy. Land transportation currently contributes about 13.6% of the total GHG emissions from the energy sector. In 2020, there are over 253,000 active private vehicles in Brunei Darussalam. There has been a steady increase in the number of gasoline and diesel vehicles in Brunei Darussalam since 2009. EVs are a viable transportation option for Brunei Darussalam as travelling pattern is primarily of short-distance with relatively inexpensive electricity for charging.

### **1.4 BNCCP Strategy 4 on Renewable Energy - Increase total share of renewable energy to at least 30% of total capacity in the power generation mix by 2035.**

Ensuring smooth transition towards a nationwide adoption and use of renewable energy technologies mainly solar photovoltaic (PV) will be critical to Brunei Darussalam in achieving its NDC. Currently, the only renewable energy source comes from a 1.2 MW

solar PV power plant, Tenaga Suria Brunei, located in Seria, Belait District accounting for about 0.14% of the total power generation mix. Solar PV is the most viable option in Brunei Darussalam due to significant solar radiance (sunlight) available throughout the country. The utilisation of renewable energy would further diversify the country's energy mix and reduces reliance on fossil fuels.

- 1.5 BNCCP Strategy 5 on Power Management - Reduce GHG emissions by at least 10% through better supply and demand management of electricity consumption by 2035.

Reducing GHG emissions contribution from the power sector would be achieved by increasing energy efficiency and conservation at both supply and demand side. Increasing the efficiency in power generation can be done through the reduction of partial load operation, improvement of transmission and distribution losses, implementation of minimum efficiency of 48% for all new power plants, and reduction of gas consumption through the integration of renewable and alternative energy so as to meet domestic power demand. Maximising clean electricity resources to supplement domestic demand encourages an equitable distribution of wealth aid aiming towards a sustainable future.

- 1.6 BNCCP Strategy 6 on Carbon Pricing - Impose price on carbon emissions for industrial sector.

The introduction of carbon pricing applicable to all industrial facilities emitting beyond a carbon emissions limit threshold at a carbon price per CO<sub>2</sub>e, by 2025. A carbon pricing scheme would act as a deterrent for excess GHG emissions. The Strategy also seeks to establish of a proper Monitoring, Reporting and Verification (MRV) system as to ensure accuracy and credibility in baseline emissions data for imposing carbon pricing.

- 1.7 BNCCP Strategy 7 on Waste Management - Reduce municipal waste to landfills to 1kg/person/day by 2035.

Minimising the amount of waste that needs to be disposed of through the adoption of best practices and innovative technologies.

- 1.8 BNCCP Strategy 9 on Carbon Inventory - Mandatory monthly and annual reporting of carbon inventory.

To develop and implement a national directive to all facilities and agents that emit and absorb GHG to report their GHG data to promote transparency and robustness in the national GHG emissions and sinks data. In ensuring the nation's accountability and responsibility to provide transparency through monitoring upholds the notion of a climate-resilient nation.

## **2.0 Overview of the Impacts of Climate Change on Brunei Darussalam**

Brunei Darussalam is located on the North Coast of the island of Borneo with a population of 442,400 over a total geographical land size of 5,765 km<sup>2</sup>. As a small, coastal area with a tropical equatorial climate, vulnerability assessments have shown that the country has medium to high climate change exposure. Brunei Darussalam's coastal areas are low-lying (up to 12 meters below sea level) which increases the country's susceptibility to the impact of rising sea levels.

The Government of Brunei Darussalam recognises the need to protect the environment and safeguard the nation's livelihoods. This is in line with the national vision of *Wawasan Brunei 2035*. The protection of both terrestrial and marine biodiversity is instrumental in supporting the country's efforts on adopting a nature-based solution approach.

### **2.1 Observed Climate Trends in Brunei**

Brunei Darussalam's climate trend suggests that there is a rise in mean temperature increasing at a rate of 0.25°C per decade. Rainfall patterns show an intensifying trend in the total rainfall amount, increasing at a rate of 100mm per decade. The highest total rainfall of 275mm was recorded on 30<sup>th</sup> September 2019 which broke the previous record of 210mm set in 2010. The sum of total rainfall in 2019 was considered normal around 3,000mm, however there is evident irregularity in terms of the monthly rainfall trend.

Climate change will further aggravate the weather disasters due to the increasing trends in extreme high temperature and rainfall, causing prolonged droughts and flash floods. The Government of Brunei Darussalam aims to enhance climate science research and provide financial support towards bolstering climate resilience. A comparative study in Brunei Darussalam identified four key climate change impacts which includes: rising temperature; rising sea levels; extreme weather events; and ocean warming and acidification.

### **2.2 Natural Disasters**

Climate change has created a variability in the weather trend which has intensified the global water cycle, and the frequency and severity of natural disaster cases. The severity of the natural disasters in Brunei Darussalam is compounded by the change in climate patterns. Hydrology experts in Brunei Darussalam perceive hydrology-related risks such as flood and droughts as the country's most severe impact from climate change. With a high proportion of settlements located along the Brunei Bay in particular, it is expected that the area will be under threat from flooding and change in river flow in the next 20 years.

The elevated temperature has resulted in increased incidents of forest and bush fires. With the rapid increase of global warming trends, the situation creates hotter and drier conditions which aggravate the intensity and severity of heatwaves, resulting in devastating fires in Brunei Darussalam's forests and peat swamps. The damage from the fires results in heavy burdens on the government and the community, create challenges in the restoration of the ecosystem, flora and fauna, cause damage to properties and residential areas, disrupting links while posing threats onto the human and wildlife health in the affected vicinities.

### 2.3 Health

According to the Ministry of Health, the effects of climate change such as extreme high temperatures contribute directly to mortalities from cardiovascular and respiratory related diseases, which are particularly significant among the elderly in Brunei Darussalam. The rising ozone and other pollutants levels in the air will also exacerbate these underlying diseases. Increasing variable rainfall patterns will lead to an increase in the frequency and intensity of floods; which can heighten the risk of the water-borne diseases and create breeding grounds for disease-carrying insects such as mosquitoes.

The *Aedes* mosquitoes vector of dengue is highly sensitive to climate conditions and studies suggest that the effects of climate change is likely to continue to increase our exposure to dengue. Children and the elderly with pre-existing medical conditions are among the most vulnerable to the resulting health risks, which are predicted to be more severe as the effects of climate change worsens. Although Brunei Darussalam has been declared malaria-free by the World Health Organization since 1987, the risk of regeneration of the *Anopheles* mosquitoes and re-introduction of malaria in Brunei Darussalam may be increased as climate conditions change. Dengue fever is also a common type of climate-sensitive disease. As of April 2019, 45 Dengue cases have been reported in Brunei and 75 Dengue cases in 2018.

### 2.4 Wildlife and Biodiversity

The protection of both terrestrial and marine biodiversity is a priority for the Government of Brunei Darussalam. The country is rich in biodiversity and tropical equatorial forest resources such as mangroves and sea grasses which are endemic to the island of Borneo.

The changes in the weather patterns will alter the phenology of migration, pollination and breeding patterns of our local wildlife and biodiversity. Climate-induced natural disasters will potentially cause destruction of wildlife habitat, which may be correlated with the loss of key wildlife species population such as the Proboscis Monkey and the Rhinoceros Hornbill. Forest fire mostly in the secondary forests and flash flood frequencies in Brunei Darussalam could also result in severe deterioration of the environmental quality and their habitat.

### 2.5 Food Security

The Department of Agriculture and Agrifood, and the Department of Fisheries of the Ministry of Primary Resources and Tourism, highlighted that the disasters associated with climate change, such as prolonged droughts, flash floods, and ocean warming and acidification, will have an adverse impact on the agricultural output and fish stocks in Brunei Darussalam. During heavy rainfall seasons, the increased frequency of flooding severely damages crops in low-lying land areas while aquaculture farms will be impacted by the saltwater intrusions during high storm surges leading to higher fish mortalities.

### **3.0 Brunei Darussalam’s Climate Adaptation and Resilience Action**

In pursuit of achieving resilience against the impact of climate change, the Government of Brunei Darussalam seeks to incorporate a series of climate adaptation strategies which aims to foster resilience and adaptation capacity of the nation.

#### **3.1 BNCCP Strategy 8 on Climate Resilience and Adaptation**

The strategy seeks to strengthen Brunei Darussalam’s resilience against climate change risks and increase its capacity to adapt to the impacts of the changing climate. This includes, among others, enhancing and integrating climate science findings into policies, conducting climate impact assessments and consideration of nature-based solutions as an option to increase resilience.

#### **3.2 Current Climate Impacts Mitigation Projects**

As part of Brunei Darussalam’s National Development Plan (NDP) projects, the Public Works Department through the Department of Drainage and Sewerage of the Ministry of Development has implemented a series of flood mitigation works along the coastal area of Brunei Darussalam. About a total of 56km coastal protection structures have been constructed to protect the country’s coastline against strong waves and erosion with the intention to maintain environmental sustainability while achieving socio-economic resilience through adequate and well-planned infrastructure and public facilities.

#### **3.3 Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR)**

The National Disaster Management Centre organises community-based activities that aim to (i) strengthen institutional capacity and policy frameworks for effective implementation for CCA and DRR; (ii) Establish an ASEAN youth leadership in CCA and DRR; (iii) Increase replicable programmes and models of building community resilience; and (iv) Strengthen awareness-building programmes on a disaster resilient and climate change adaptive ASEAN Community.

The programmes are delivered in a form of workshops and forums with the aim to develop a disaster-resilient community by increasing education and awareness while nurturing public preparedness against climate-induced disasters.

### **4.0 Awareness and Education**

BNCCP Strategy 10 on Awareness and Education is an important strategy that enables the realisation of Brunei Darussalam’s climate mitigation and adaptation efforts. This strategy seeks to foster awareness and increase education in matters pertaining to climate change mitigation and adaptation efforts in all sectors of society, in line with a Whole-of-Nation approach, including the general public, private sectors, Non-Governmental Organisation, associations and most importantly, the youth.

### **5.0 BNCCP Operational Document**

With the launching of the first BNCCP, the Brunei Darussalam Executive Committee on Climate Change developed the BNCCP Operational Document Phase I (2021-2025), outlining detailed action plans, Key Performance Indicators (KPI), timelines and appropriate monitoring mechanism in implementing the ten core national strategies set out in the BNCCP.

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