



ཀྲུལ་ཡོངས་མཐའ་འཁོར་གནས་སྤངས་ལྟན་ཚོགས།  
དཔལ་ལྷན་འབྲུག་གཞུང་།  
**National Environment Commission**  
Royal Government of Bhutan



NEC/CC/FCCC/2015/ 706

30 September 2015

Ms. Christiana Figueres  
Executive Secretary  
UN Climate Change Secretariat  
Bonn  
Germany

**Sub: Communication of INDC of the Kingdom of Bhutan**

Excellency,

I have the honour to communicate the intended nationally determined contribution of the Kingdom of Bhutan.

Bhutan's INDC builds on the declaration to remain carbon neutral made in 2009 and as a highly vulnerable landlocked mountainous least developed country, an adaptation component is also included in our INDC.

Bhutan remains committed to the ideals and missions of the UNFCCC and the negotiations process to adopt a legally binding agreement at the twenty first session of the conference of parties in December 2015.

Please accept, Excellency, the assurance of my highest consideration.

Yours sincerely,

  
Yeshey Dorji  
Vice Chair of National Environment Commission  
Minister for Agriculture and Forests

Attachment: INDC of the Kingdom of Bhutan (8 pages)

# **Kingdom of Bhutan**

## **Intended Nationally Determined Contribution**

### **Introduction**

The Kingdom of Bhutan is committed to a successful conclusion of negotiations under the Adhoc-Working Group on the Durban Platform for Enhanced Action (ADP) to adopt a new legally binding agreement under the UNFCCC to be implemented from 2020. In accordance with relevant paragraphs of Decisions 1/CP.19 and 1/CP.20 the Kingdom of Bhutan communicate its Intended Nationally Determined Contribution (INDC) and re-communicates our resolve to remain carbon neutral by ensuring that our emission of GHGs does not exceed the sink capacity of our forests.

The Kingdom of Bhutan made the commitment to remain carbon neutral in 2009<sup>1</sup> despite our status as a small, mountainous developing country with many other pressing social and economic development needs and priorities. This commitment was made with the view that there is no need greater, or more important, than keeping the planet safe for life to continue. While making this sincere commitment to remain carbon neutral, we also called on the global community to support our resolve and efforts to fulfil this commitment and support us to undertake appropriate mitigation and adaptation measures.

As a land-locked least developed country located in a fragile mountainous environment, Bhutan remains highly vulnerable to the impacts of climate change and will disproportionately bear the impacts of climate change. Therefore an adaptation component is also included in the INDC from Bhutan.

Considering the historical and current emissions from Bhutan and our imperatives for sustainable development, Bhutan's INDC is most ambitious and more than our fair share of efforts to combat climate change. Therefore, in putting forward this INDC, we once again call on the international community to support our efforts to mitigate and adapt to climate change.

### **National Context**

The Kingdom of Bhutan is a small landlocked and least developed country with a total area of 38,394 sqkm and is characterized by rugged mountainous terrain with elevations ranging from around 160 meters to more than 7000 meters above sea level. The population is projected to be around 745,000 with 56.3% of the total engaged in agriculture and forestry<sup>2</sup>.

---

<sup>1</sup> Declaration of the Kingdom of Bhutan - the Land of Gross National Happiness to Save our Planet, dated 11 December 2009.

<sup>2</sup> Statistical Yearbook of Bhutan 2014, NSB

Export of electricity from hydropower projects form a major source of revenue for the government and development activities<sup>3</sup>.

According to the second national GHG inventory, Bhutan is a net sink for greenhouse gases. The estimated sequestration capacity of our forest is 6.3 million tons of CO<sub>2</sub> while the emissions for year 2000 is only 1.6 million tons of CO<sub>2</sub> equivalent. This is largely due to huge areas of forest cover, low levels of industrial activity and almost 100% electricity generation through hydropower.

Although the highest emissions are from the agriculture sector they have more or less remained constant, but emissions from sectors such as industrial processes and transport are showing a rapidly increasing trend<sup>4</sup>. During the period 2000-2013, emissions from the energy sector increased by 191.6% from 0.270 million tons of CO<sub>2</sub>e in 2000 to 0.79million tons of CO<sub>2</sub>e in 2013. During the same period, emissions from industrial processes increased by 154.3% from 0.24 million tons of CO<sub>2</sub>e to 0.6 million tons of CO<sub>2</sub>e. Emission from waste management also increased by 247.54% from 0.047 million tons of CO<sub>2</sub>e to 0.16 million tons CO<sub>2</sub>e.

Forests currently cover 70.46%<sup>5</sup> of the land area of Bhutan and sequestration by forests is estimated<sup>6</sup> at 6.3 million tons of CO<sub>2</sub> and emissions in 2013 are estimated at 2.2 million tons of CO<sub>2</sub> equivalent<sup>7</sup>.

As reported in the Second National Communication, Bhutan is highly vulnerable to adverse impacts of climate change due to the fragile mountainous ecosystem and economic structure. The most vulnerable sectors are water resources, agriculture, forests & biodiversity and hydropower sectors. It is projected that both the frequency and intensity of extreme climate events would increase with changing climate.

Major existing laws and policies applicable to the INDC from Bhutan include the Constitution of the Kingdom of Bhutan, National Environment Protection Act (NEPA) 2007, National Forest Policy 2011, and Economic Development Policy (EDP) 2010.

## **Mitigation**

Bhutan intends to remain carbon neutral where emission of greenhouse gases will not exceed carbon sequestration by our forests, which is estimated at 6.3 million tons of CO<sub>2</sub>. Bhutan will maintain a minimum of 60 percent of total land under forest cover for all time in accordance the Constitution of the Kingdom of Bhutan. Efforts will also be made to maintain current levels of forest cover, which currently stand at 70.46%, through sustainable forest management and conservation of environmental services.

---

<sup>3</sup> National Accounts Statistics 2014, NSB

<sup>4</sup> Second National Communication from Bhutan to UNFCCC, 2011

<sup>5</sup> Land Cover Mapping Project, 2010, NSSC

<sup>6</sup> Second National Communication from Bhutan to UNFCCC, 2011

<sup>7</sup> Unpublished estimates by NECS, RGOB 2015

Hydropower from run-of-the-river schemes account for almost 100% of electricity generation in Bhutan with almost 100% access to electricity in urban areas and 94% in rural areas. Presently, Bhutan offsets 4.4 million tons of CO<sub>2</sub>e through exports of hydroelectricity. In addition, Bhutan can offset up to 22.4 million tons of CO<sub>2</sub>e per year by 2025 in the region through the export of electricity from our clean hydropower projects.

Various other policies and initiatives are also already in place that contribute to mitigation such as sustainable land management practices, improved livestock management, promotion of organic agriculture and promotion of zero emission vehicles. The Economic Development Policy of 2010 and draft of 2015 also provide several measures to promote “green growth” for industrial development. The present five year development plan (2013-18) has also integrated carbon neutral development as part of the national key result areas to guide planning and implementation of development activities within all sectors.

As a least-developed country, Bhutan has a development imperative and will pursue ecologically balanced sustainable development in line with our development philosophy of Gross National Happiness. To remain carbon neutral, growing emissions from economic development will need to be mitigated by pursuing low emission development pathways across all sectors. However international support will be essential to ensure success in implementing the strategies, plans and actions for low GHG development.

### ***Strategies, plans and actions for low GHG emission development***

While the basis of our mitigation efforts rests on conserving our forests as carbon sinks, managing the growing emissions as a result of economic development will be through priority strategies, plans and actions for mitigation to support a low emission development pathway. These plans and priority actions, listed below, are based on the National Environment Protection Act, National Strategy and Action Plan for Low Carbon Development (2012), Economic Development Policy (2010 and draft 2015), Bhutan Transport 2040: Integrated Strategic Vision, National Forest Policy, and other sectoral plans and strategies.

The gases covered include carbon dioxide, methane and nitrous oxide as they were shown to be the priority gases in our second national communication.

1. Sustainable forest management and conservation of biodiversity to ensure sustained environmental services through:
  - Sustainable management of forest management units (FMUs), protected areas, community forests, forest areas outside FMUs, and private forests
  - Enhancing forest information and monitoring infrastructure through national forest inventories and carbon stock assessments
  - Forest fire management and rehabilitation of degraded and barren forest lands
2. Promotion of low carbon transport system by:
  - Improving mass transit and demand side management of personal modes of transport

- Exploring alternative modes of transport to road transport such as rail, water and gravity ropeways
  - Improving efficiency in freight transport
  - Promoting non-motorized transport and non-fossil fuel powered transport such as electric and fuel cell vehicles
  - Improving efficiency and emissions from existing vehicles through standards and capacity building
  - Promoting use of appropriate intelligent transport systems
3. Minimize GHG emission through application of zero waste concept and sustainable waste management practices:
    - Enhancement of the three R principles including the conversion of waste to resources
    - Improving the current system and infrastructure for waste management
  4. Promote a green and self reliant economy towards carbon neutral and sustainable development through:
    - Improvement of manufacturing processes in existing industries through investments and adoption of cleaner technology, energy efficiency and environmental management
    - Enhance and strengthen environmental compliance monitoring system
    - Promote investment in new industries that are at higher levels in the value chain, and green industries and services.
    - Promote industrial estate development and management in line with efficient, clean and green industry development objectives
  5. Promote clean renewable energy generation:
    - Pursue sustainable and clean hydropower development with support from CDM or other climate market mechanisms to reduce emissions within Bhutan and the region by exporting surplus electricity
  6. Promote climate smart livestock farming practices to contribute towards poverty alleviation and self sufficiency through:
    - Organic livestock farming and eco-friendly farm designs
    - Improvement of livestock breeds, including conservation of native genetic gene pool/diversity
    - Expansion of biogas production with stall feeding
    - Agro-forestry or agro-silvo pastoral systems for fodder production
  7. Promote climate smart agriculture to contribute towards achieving food and nutrition security through:
    - Organic farming and conservation agriculture
    - Development and promotion of sustainable agricultural practices
    - Integration of sustainable soil and land management technologies and approaches

8. Energy demand side management by promoting energy efficiency in appliances, buildings and industrial processes and technologies.
9. Integration of low emission strategies in urban and rural settlements through green buildings, sustainable construction methods and climate smart cities.

## **Adaptation**

Adaptation to the adverse impacts of climate change is a priority for Bhutan. In addition to being a land locked and least developed country with a fragile mountainous environment, Bhutan is further threatened by climate change due to the high dependence of the population on agriculture and the significant role of hydropower for economic development. Bhutan also faces increasing threats from climate hazards and extreme events such as flash floods, glacial lake outburst floods (GLOF), windstorms, forest fires and landslides.

Despite following a cautious approach to development by balancing the need for environmental conservation and economic development, climate change threatens to derail the substantial gains made by Bhutan towards sustainable socio-economic development. Therefore, international support is essential to address the adverse impacts of climate change that are already starting to take place in Bhutan and also to safeguard the gains made towards sustainable development.

Bhutan prepared its National Adaptation Program of Action (NAPA) in 2006 and also updated the project profiles (2012) and is now implementing few of the priority actions identified as urgent and immediate needs. For the medium to long term, Bhutan views the process to formulate and implement National Adaptation Plans (NAPs) as an important means towards reducing vulnerability by both integrating climate change adaptation into national development planning and also implementing priority adaptation actions on the ground. Bhutan will be fully engaged in the NAP process and begin the formulation of the first NAP once support is received.

Based on the information presently available through the NAPA, the vulnerability and adaptation assessment in the Second National Communication and other plans and programs in sectors, priority adaptation actions are foreseen in key sectors and areas as follows:

### ***Priority adaptation needs***

1. Increase resilience to the impacts of climate change on water security through Integrated Water Resource Management (IWRM) approaches including:
  - Water resources monitoring, assessment, and mapping
  - Adoption and diffusion of appropriate technologies for water harvesting and efficient use
  - Climate proofing water distribution systems
  - Integrated watershed and wetland management

2. Promote climate resilient agriculture to contribute towards achieving food and nutrition security through:
  - Developing and introducing climate resilient crop varieties and conservation of plant genetic resources
  - Developing and institutionalising surveillance of crop pests and diseases
  - Enhancement of national capacity to develop and implement emergency response to agricultural pest and disease outbreaks/epidemics
  - Establishment of cold storage facilities at sub-national regions
  - Improving and increasing investment in irrigation systems and management
  - Initiating crop insurance programs against climate induced extremes
  - Promotion of sustainable soil and land management technologies and approaches
  
3. Sustainable forest management and conservation of biodiversity to ensure sustained environmental services through:
  - Sustainable management of forest management units (FMUs), protected areas, community forests, forest areas outside FMUs, and private forests
  
4. Strengthen resilience to climate change induced hazards through:
  - Improved monitoring and detection of hydromet extremes using remote sensing and satellite-based technologies and approaches
  - Continual assessment of potentially dangerous glacial lakes and improvement of early warning system for GLOFs
  - Develop a monitoring, assessment, and warning systems for flash flood and landslide hazards and risks
  - Forest fire risk assessment and management
  - Assessment and management of risk and damage from windstorms on agricultural crops and human settlements.
  - Enhancement of emergency medical services and public health management to respond to climate change induced disasters
  - Enhancing preparedness and response to climate change induced disasters at the national and local levels
  
5. Minimize climate-related health risks through:
  - Strengthening integrated risk monitoring and early warning systems and response for climate sensitive diseases
  - Promotion of climate resilient household water supply and sanitation
  
6. Climate proof transport infrastructure against landslides and flash floods, particularly for critical roads, bridges, tunnel and trails
  
7. Promote climate resilient livestock farming practices to contribute towards poverty alleviation and self sufficiency through:
  - Climate change resilient farm designs and practices
  - Livestock insurance against climate induced extremes

8. Enhancing climate information services for vulnerability and adaptation assessment and planning through:
  - Improvement of hydro meteorological network and weather and flood forecasting to adequate levels of temporal and spatial scales
  - Development of climate change scenarios for Bhutan with appropriate resolution for mountainous situation
9. Promote clean renewable and climate resilient energy generation by:
  - Diversifying energy supply mix through promotion of renewable energy (solar, wind, small hydro, biomass) other than large hydro and creating investment opportunities
  - Ensuring energy security during the lean dry season through water storage and reservoirs
  - Protecting catchment areas for hydropower through watershed and sustainable land management approaches
10. Integrate climate resilient and low emission strategies in urban and rural settlements through:
  - Promotion of climate smart cities
  - Improvement of storm water management and sewer systems
  - Environmental management and safeguards of development activities

### **Means of Implementation**

As the vast forest sink of Bhutan will form the cornerstone of our commitment to remain carbon neutral, measures to manage and conserve the forests will need to be supported by a robust forest monitoring system. The first comprehensive national forest inventory presently underway will provide an updated state of the forests in Bhutan by end of 2016. The forest monitoring and inventory system being developed in conjunction with a national forest monitoring system for REDD+ will enable monitoring and assessment of forest cover over time.

Mitigation measures to manage and reduce emissions in priority areas and sectors will need to be implemented through relevant low emission development strategies, programs and plans. A combination of fiscal incentives within the NEPA and EDP, financial and technical support from international climate mechanisms, and enforcement of existing legislation for environmental safeguards such as NEPA and Environment Assessment Act 2000 will also be required.

In order to ensure efficient and coordinated approaches to implementation of mitigation and adaptation priorities, existing institutional arrangements such as the National Environment Commission (which also acts as the high level National Climate Change Committee) and Multi-Sectoral Technical Committee on Climate Change will play the lead role in coordinating action on climate change in Bhutan. Synergies will also be considered in planning and implementation of mitigation and adaptation actions across relevant agencies



and sectors, between national and local level planning, across sub-national regions, and also with actions under other multilateral environmental agreements. Public private partnership (PPP) model of implementing actions will also be considered where appropriate.

Enhancing awareness and capacity through education, research on areas of concern in Bhutan and institutional strengthening will also be essential for successful implementation of the intended actions. Other indirect success may also be achieved through advocacy and behavioural changes to promote sustainable consumption, energy efficiency and other climate friendly actions.

Since the intended actions in the INDC apply to the post 2020 period, the priority mitigation and adaptation actions within this INDC will be considered and integrated in the preparation of the 12<sup>th</sup> Five Year Development Plan (2018-2023) and also subsequent five year plan periods. The cycles of the national five-year development plan process along with the cycles of the INDCs, yet to be determined under the new climate agreement, will form the basis for the national process to review progress in actions and support received.

Bhutan is already spending its own resources for some climate change adaptation and mitigation actions through the budgeting for the current five-year plan, which includes an objective for carbon neutral and climate resilient development. Our hydropower projects are also being built at great additional expense to take into account the need to withstand catastrophic GLOF events. The Bhutan Trust Fund for Environmental Conservation also provides local funding for projects addressing mitigation and adaptation.

However the scale of funding available to address both development needs and the additional burden of mitigation and adaptation will be significantly higher than presently available. As a least-developed country, with a young population and pressing needs and imperatives for economic development, the successful implementation of our intended actions to mitigate will depend on the level of financial and technical support received. Implementing adaptation measures through the NAP process with sufficient funding will also be required to ensure that progress made over the past few decades are not derailed by the adverse impacts of climate change.

Bhutan remains committed to a globally collective effort in addressing climate change and keeping the planet safe for all life, and strives towards an ambitious and legally binding agreement to keep global temperature increase at safe levels of not more than 1.5 degrees Celsius.

---