CHAPTER FIFTEEN

ENVIRONMENT, CLIMATE CHANGE AND DEVELOPMENT

Bangladeshis one of the richest countries in world in terms of bio-diversity. However, environmental degradation is a crucial challenge for Bangladesh like other developing countries. A number of policies and development plans have been adopted and are being implemented to encounter environmental hazards and to ensure a pollution-free eco-friendly environment. Strategies have also been developed to achieve the environment related goals delineated in the Sustainable Development Goals (SDGs). The government formulated 'Bangladesh Climate Change Strategy and Action Plan (BCCSAP)'- 2009 to cope with the adverse effects of climate change. In this plan, 44 programmes under six thematic areas were identified. Bangladesh Climate Change Trust Fund (BCCTF) was created in 2010 from the Government's own revenue sources to combat climate change impacts as well as to implement Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009. All projects taken up under BCCTF are based on the thematic areas mentioned in BCCSAP 2009. From the FY 2009-10 to FY 2020-21, BCCTF received a total allocation of Tk. 3,900 crore and till August 2020, a total of 789 projects under BCCTF have been approved of which 728 projects are implemented by the government Ministries/Divisions while the remaining 61 projects were implemented by different NGOs. Taking into account the challenges of environment, environment and biodiversity conservation and management, the government has finalised the National Environment Policy 2018 and published it in 2019 with the aim of developing the overall environmental conservation management of the country. In the newly adopted National Environmental Policy 2018, out of 9 more sectors/areas including the previous 15 sectors, mountain environment, biodiversity and environment conservation and life security, eco-friendly tourism, etc. sectors have been included with special emphasis. The Ministry of Environment, Forest and Climate Change has also undertaken different consciousness programmes and restructuring activities for environment conservation along with pollution control. Besides, Ministry of Disaster Management and Relief is also implementing various programmes in order to tackle eventualities emanating from natural disasters.

The concept of environmental protection as well as its development received wider global attention from the early 1970s. The decision agreed upon at the UN conference on the human environment held in Stockholm in 1972 worked as an eye-opener for international communities. The 'United Nations Environment Programme (UNEP)' was formed by this conference. In 1992, an Earth Summit was held at Rio De Jeneiro in Brazil, which is considered as a landmark in the environment conservation. Later, 'Kyoto Protocol' was signed in 1997, which proposed lessening of carbon dioxide and greenhouse gas emission.

Table 15.1 shows the list of 10 highest emitting countries with the level of their Green House Gas (GHG) emissions, which accounts for almost 65 percent of global GHG emission. In 2018, the global GHG emission stands at 48,939.71MtCO_2.

Table 15.1: Top Ten Greenhouse Gas Emitting Countries in the World

Sl. No	Country	Annual CO_2Emissions in 2018 (In millions ofmetric tonnes)	% of Global Total in 2018
1	China	11,705.81	23.92
2	USA	5,794.35	11.84
3	India	3,346.63	6.84
4	Europe	3,333.16	6.81
5	Russia	1,992.08	4.07
6	Brazil	1,420.58	2.90
7	Japan	1,154.72	2.36
8	Iran	828.34	1.69
9	Germany	776.61	1.59
10	Canada	763.44	1.56

Source: CAIT Climate Data Explorer, 2021

International Efforts for Addressing Climate Change

The United Nations Climate Change Conferences are yearly conferences of the UNFCCC Parties (Conference of the Parties, COP) to assess progress in dealing with the climate change issues. Implementation status of UNFCCC is mainly discussed in these conferences.

The COP 21 was held in Paris in 2015 and a climate change agreement called 'Paris Agreement' was accepted by 195 countries. The COP 22 was held at Marrakesh in Morocco. The first meeting of the apex body of implementing Paris Agreement 'Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA)' was held during this conference. The meeting decided to formulate the 'Paris Agreement Work Programme' by 2018. COP 23 took place in Bonn, Germany in 2017. COP 24 held at Katowice, Poland, accepted a 'Paris Agreement Work Programme'. All the participant countries agreed to reduce carbon emission in the conference. In addition, it was decided that the countries would publish the progress report of carbon emission biennially from 2024.

COP 25 took place under the Presidency of the Government of Chile and was held with logistical support from the Government of Spain in 2019. The COP was intended to finalise the 'rulebook' of the Paris Agreement- the operating manual needed when it takes effect in 2020 - by settling on rules for carbon markets and other forms of international cooperation under 'Article 6' of the deal. Ultimately, however, the talks were unable to reach consensus in many areas, pushing decisions into next year under 'Rule 16' of the UN climate process.

The UK will host the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow on 1-12 November 2021. This COP summit intends to bring parties together to accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change.

Threats to Bangladesh due to Climate Change

The rise in sea-level poses a big threat to the lives and livelihood of the huge population living in the coastal areas of Bangladesh. About 60 percent of land of the country is only 5 meters above from sea level. 'Hadley Center for Climate Prediction and Research (HCCPR)' estimates that sea level in Bangladesh will rise about 40 cm by 2080.

Providing *REgional* Climates for Impact Studies (PRECIS) has projected that annual average rainfall of Bangladesh will increase about 4 percent, 2.3 percent and 6.7 percent in 2030, 2050 and 2070 respectively.

Moreover, according to the projection of General Circulation Model (GCM) the annual average temperature of Bangladesh will increase by 2.4 degree Celsius and annual average rainfall will be increased by 9.7 percent within 2100. A study of the World Bank noted that up to two-thirds of Bangladesh is inundated by floods in every three to five years. As a result, infrastructure, housing, agriculture, and livelihoods damaged extremely.

In addition, low-lying coastal areas are also at risk from cyclones and storm surges. 'Inter-governmental Panel on Climate Change (IPCC)' predicts that by 2050, Bangladesh will lose 17 percent of its land and 30 percent of its food production because of negative impact of climate change.

The report 'Economics of Adaptation to Climate Change in Bangladesh, 2010' of the World Bank estimates that Bangladesh will be required US$ 5,516 million for investment and US$ 112 million for recurrent cost until 2050 to protect against storm surge risk only.

Bangladesh is developing a 'National Adaptation Plan (NAP)' under UNFCCC in order to formulate an integrated adaptation strategy and activities to meet long-term impact of climate change. Meanwhile, a 'NAP Road Map' has also been prepared. In addition, Bangladesh has prepared 'Nationally Determined Contribution (NDC)' plan to manage growing emissions without compromising the required development. According to this plan, it is estimated to reduce 5 percent carbon emission voluntarily and additional 10 percent reduction if international assistance is available by 2030. The government has also developed the 'NDC Implementation Road Map.

Moreover, 'Nationally Appropriate Mitigation Action (NAMA)' is being formulated. A 'Climate Change Unit' has also been established at Ministry of Environment, Forest and Climate Change. Apart from this, various programmes and projects are being implemented by the government to adapt climate change impact.

A long-term integrated water sector mega plan 'Bangladesh Delta Plan 2100' has been formulated to combat climate change impact. The vision of the plan is to achieve upper middle-income status through eliminating extreme poverty by 2030 and to graduate to a prosperous country beyond 2041. Furthermore, six specific goals have been fixed to this plan. The goals are: (a) ensure safety from floods and climate change related disasters; (b) enhance water security and efficiency of water usages; (c) ensure sustainable and integrated river systems and estuaries management; (d) conserve and preserve wetlands and ecosystems and promote their appropriate use; (e) develop effective institutions and equitable governance for in-country and trans-boundary water resources management, and (f) achieve optimal and integrated use of land and water resources. With a view to attaining these goals 'Bangladesh Delta Plan 2100' has taken 'Flood Risk Management Strategies' and 'Fresh Water Strategies' at national level.

Internal Climate Finance

Bangladesh is pioneer among the developing countries regarding the enactment of climate finance for adaptation and mitigation of climate change that has been causing natural calamities and disasters. Finance Division published its first climate budget report titled 'Climate Protection and Development' covering 6 most climate relevant ministries in FY 2017-18. Inspired by the good response from every corner of the government and international communities, Finance Division brought out the second report 'Climate Financing for Sustainable Development' reflecting climate expenditure of 20 line-ministries in FY 2018-19. In its third and fourth report for FY 2019-20 and FY 2020-21, the coverage was extended to 25 climate relevant ministries/divisions. The budget allocation of these 25 ministries accounted for 56.69 percent of the total national budget of FY2020-21and out of their total allocation 7.55 percent is climate relevant. The climate relevant allocation for development budget increased from 6.6 percent in FY 2015-16 to 7.55 percent in FY 2020-21. In absolute terms, over these six years the total climate relevant allocation increased from Tk. 12,163 crore in FY 2015-16 to Tk. 24,225.49 crore, which is 0.8 percent of the estimated GDP of FY 2020-21.

The government formulated 'Bangladesh Climate Change Strategy and Action Plan'- 2009 to cope with the adverse effects of climate change. In this plan, 44 programmes under six thematic areas were identified. Bangladesh Climate Change Trust Fund (BCCTF) was created in 2010 from the Government's own revenue sources to combat climate change impacts as well as to implement Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009. All projects taken up under BCCTF are based on the thematic areas mentioned in BCCSAP 2009. From the FY 2009-10 to FY 2020-21, BCCTF received a total allocation of Tk. 3,900 crore and till August 2020, a total of 789 projects under BCCTF have been approved of which 728 projects are implemented by the government Ministries/Divisions while the remaining 61 projects were implemented by different NGOs under the supervision of *Palli Karma Sahayak* Foundation (PKSF). Among the ministries/divisions, Local Government Division received the highest allocation of Tk. 1,312.96 crore followed by Ministry of Water Resources and Ministry of Environment, Forest and Climate Change with allocation of Tk. 1,043.77 crore and Tk. 415.15 crore respectively. Annex. 15.1 to 15.3 show the number and allocation of projects finance by the Climate Change Trust Fund.

International Climate Finance

Green Climate Fund (GCF) is the largest source of climate finance globally which is governed by a 24-member board, comprised equally of developed and developing countries, representing the United Nations Regional Groups. In Bangladesh the Economic Relations Division (ERD) is the National Designated Authority (NDA) for GCF. Since ERD became the NDA of Bangladesh in November 2014, it has identified 6 potential National Implementing Entities (NIEs)- Infrastructure Development Company Limited (IDCOL), PKSF, Department of Environment, Bangladesh Bank, Local Government and Engineering Department (LGED) and Bangladesh Climate Change Trust (BCCT), of which IDCOL and PKSF have got accredited by the GCF board. Bangladesh has received GCF Readiness support for strengthening NDA's Secretariat, preparing GCF country programme and accreditation GAP assessment for LGED- the prospective entity selected by ERD to get NIE accreditation support. Now the NDA secretariat is actively working on creating a GCF country programme and a strong project pipeline, which would enhance Bangladesh's readiness for accessing and utilizing GCF climate funds. Up to March 2021, five climate change projects worth GCF Financing of US$ 351.1 million. Projects are:

- Promoting private sector investment through large scale adoption of energy saving technologies and equipment for Textile and Readymade Garment (RMG) sectors of Bangladesh (total project value US$ 340 million).
- Increasing the resilience of poor, marginalised and climate-vulnerable communities in flood-prone areas of Bangladesh. (total project value US$ 13.3 million).
- Global Clean Cooking Programme Bangladesh (total project value US$40 million).
- Enhancing adaptive capacities of coastal communities, especially women, to cope with climate change induced salinity (total project value US$ 33 million).
- Climate Resilient Infrastructure Mainstreaming (CRIM) (total project value US $81 million).

Green Banking and Sustainable Finance

In order to facilitate green products/sector financing such as solar energy, bio-gas plant, effluent treatment plant, Bangladesh Bank established a revolving refinancing scheme of Tk. 200 crore in 2009 for green products/sector

from its own fund. The size of the fund has been increased Tk. 400 crore in view of the growing demand for financing of environment friendly products/initiatives. At present, this scheme is known as 'Refinance Scheme for Environment Friendly Products/Initiatives'. During FY2020-21, a total of Tk. 50.70 crore has been disbursed as refinance facility in green products/initiatives such as Biogas Plant, Green Industry, Vermi Compost, Solar Home System, Biological ETP, Solar Mini Grid, Installation of Energy Auditor Certified Machineries, and Safety and Work Environment of Factory.

Removing Air Pollution

Air pollution is increasing with rapid urbanisation and industrialisation. Emissions from brick kiln, construction activities, industrial operation and vehicle are considered the key sources of air pollution. The Department of Environment (DoE) works for establishing energy saving, effective in air pollution and modern technology based environment-freindly brick kiln instead of traditional brick kiln to reduce brick kiln emision. 'The Brick Manufacturing and Kilns Establishment (Control) Act, 2013' has been enacted to manage brick construction industry in accordance with the environment which has been effected from July 2014. The act realistically amended in 2019. A comprehensive 'Air Pollution Control Rules, 2021' has been drafted with a view to effectively controlling overall air pollution.

For measuring air pollution levels regularly, a total of 16 Continuous Air Monitoring Station (CAMS) have been set up in the divisional and industrial city of the country including Dhaka. In addition, 15 more Compact Continuous Air Monitoring Station (C-CAMS) have been set up in different districts and important places. At present, a total of 31 CAMS and C-CAMS are being used to conduct air monitoring at various places regularly.

A comprehensive 'Air Pollution Control Rules, 2021' has been drafted with a view to effectively controlling overall air pollution. Necessary steps are being taken to approve the draft very quickly. The government's plan to control air pollution is shown in Annex 15.4.

Industrial Pollution Control

- **Issuance of Environmental Clearance:** In accordance with Section 12 (1) of the Environmental Protection Act, 1995 (Amended 2010) in Bangladesh, it is mandatory to obtain environmental clearance in the prescribed manner as per the Environmental Protection Rules, 1997. According to the rules, all types of industries and projects are being forced to take environmental clearances.
- **Establishment of ETP:** The Department of Environment is compiling a detailed database of all the industrial establishments generating liquid waste and compelling non-ETP industrial establishments to establish ETP. ETPs have already been ensured in most of the industrial establishments including all the large industrial establishments. As of February 2021, the number of ETP establishable industrial units identified is 2,415 and the total number of industrial units established by ETP is 2,063.
- **Implementation of Zero Discharge Plan:** Zero Discharge Plan is being implemented by the DoE in the industrial establishments discharging liquid waste under which the industrial enterprises are reusing the generated liquid waste without discharging it in nature. From 2014 to February 2021, the DoE has approved a Zero Discharge Plan in favour of a total of 600 T-Waste Emitting Industries.

Pollution Control Enforcement Activities

In order to prevent the destruction of the environment and the widespread pollution of the environment, the DoE started enforcement

activities under the said section of the Act against polluters from July 13, 2010. Under the enforcement activities, the DoE takes other legal action including imposition of compensation against persons/institutions involved in pollution and conducts regular monitoring activities of industries. According to Section 7 of the Bangladesh Environmental Protection Act, 1995, there is a provision to collect compensation by conducting enforcement activities against polluting industrial establishments. DoE has carried out operations against 6,491 river polluting industrial establishments for damaging the environment from July 13, 2010 to February 2021.

Formulation of Biodiversity and Biodiversity Regulations

- **National Environmental Policy, 2018:** Taking into account the challenges of environment, environment and biodiversity conservation and management, the government has finalised the National Environment Policy 2018 on 3 October 2017 and published it in 2019 with the aim of developing the overall environmental conservation management of the country. In the newly adopted National Environmental Policy 2018, out of 9 more sectors/areas including the previous 15 sectors, mountain environment, biodiversity and environment conservation and life security, eco-friendly tourism, etc. sectors have been included with special emphasis. In order to implement the activities included in the 24 sectors mentioned in the National Environmental Policy 2018, the concerned ministries/ divisions/agencies have been identified which will be implemented by their respective ministries/divisions/agencies.
- **Bangladesh Biodiversity Act 2018:** The Bangladesh Biodiversity Act 2018 has been promulgated with the aim of conserving biodiversity and ensuring its sustainable use and has come into force on 30 November 2018. Under the Act, a Union Biodiversity Management Committee has been formed from the National Committee on Biodiversity to implement biodiversity conservation activities at the grassroots level.
- **Environmental Crisis Management Rules, 2017:** The Environmental Crisis Management Rules, 2018 have been promulgated on 25 September 2017 to protect the environment with the powers given in the Bangladesh Environmental Protection Act, 1995. A notification has been issued by forming a national committee of ECA management under the said rules.
- **The 6thNational Report on CBD:** As a signatory to the Biodiversity Charter, Bangladesh submits a national report on biodiversity to the CBD Secretariat every four years. In 2015, the 5thNational Report on the Biodiversity Charter was prepared and submitted to the CBD Secretariat. Following this, the 6thNational Report has been prepared. The Report was submitted to the CBD Secretariat in November 2019.

National Biodiversity Strategy and Action Plan (NBSAP) 2016-2121: As a member country of the Convention on Biological Diversity (CBD), the DoE is working to fulfill Bangladesh's commitment in the international arena. At the 10thCBD Conference of Parties in 2010, 20 Strategic Goals (Biodiversity Strategic Planning 2011-2020) were set out under 5 Strategic Goals for the conservation of biodiversity, which are called *Aichi* Biodiversity Targets. The National Biodiversity Strategy and Action Plan 2018-2021 (NBSAP) has been formulated in the light of the UN-announced Biodiversity Strategic Plan 2011-2020, setting targets for biodiversity conservation at the national level.

Biosafety

Bangladesh, as a member of the *Cartahena* Protocol on Biosafety in the Biodiversity Charter,

has enacted regulations on biodiversity. The National Biosafety Policy, Monitoring and Enforcement Manual, Lab Safety Manual, Risk Analysis Framework has been drafted under the project titled Implementation of National Biosafety Framework (INBF). Biosecurity Rules2012 under the Bangladesh Environmental Protection Act, 1995 (Amended 2010) to ensure the safety of life in research, development, transfer and cross-border transportation of Genetically Modified Organisms (GMOs) has been formulated. Drafts of National Life Security Policy, update of Life Safety Rules, update of Biosafety Guidelines have been prepared. A state-of-the-art GMO Detection Lab has been set up by the DoE to ensure the safety of life. A Web Based Networking System (biosafetybd.org/ Home/Index) has been established to establish a mutual network of scientists, researchers, research institutes and concerned government officials involved in research and regulation activities on biotechnology.

Blue-Economy Implementation Activities

The DoE has adopted a blue-economy action plan to conserve marine environment, prevent marine pollution, ensure marine resource extraction and environmental management, and conserve marine and coastal biodiversity and mainstream development activities. The action plan includes the following activities:

- Include the marine biodiversity conservation and management activities in the mainstream of development.
- Increase the capacity of the DoE for the management of coastal and marine resources.
- Create an integrated database of coastal and marine resources and the environment and biodiversity in the context of the adverse effects of climate change.
- Determine strategic environmental impact on coastal and marine resource extraction and management.
- Ensure conservation and management of coastal and marine environment and biodiversity.
- Prevent the marine pollution and conserve marine environment by implementing international conventions and protocols on marine conservation.
- Strengthen the legal framework to control marine pollution.
- Monitor the effects of various pollutants on the marine ecosystem.
- Monitor the impact of climate change on the marine environment.

DoE has developed some project documents to implement the action plan such as ‘Comprehensive database of coastal and marine resources and the environment and biodiversity in the context of adverse effects of climate change’ and ‘Monitoring the impact of various pollutants on the marine ecosystem’.

Ecologically Critical Area (ECA)

To protect the important environment and biodiversity of the country and to preserve and improve the natural environment, the government under the Bangladesh Environmental Protection Act 1995 to cut or extract natural forests and plants for the conservation of biodiversity, killing all kinds of prey and wildlife, oysters, corals, turtles and other wildlife The government has already declared 13 important areas as Ecologically Critical Areas (ECA) by banning all activities such as collection, destruction of animal and plant habitats, etc.

Sustainable Development Goals (SDGs) and Bangladesh

The government is working for the implementation of the environment and climate related goals and targets of SDGs. Among 17 goals of SDGs, 3 goals are directly linked with environment and climate. The Goal 13 declares ‘Take urgent action to combat climate change and its impacts’. According to the first indicator of goal 13 ‘Number of deaths, missing persons and directly affected persons attributed to

disasters per one lakh populations reduce to 6,500 by 2020 and 1,500 by 2030.' According to 'SDGs: Bangladesh Progress Report-2020'currently in Bangladesh the number of affected persons is 4,352 in 2019.

The goal 14 says 'Conserve and sustainably use the oceans, seas and marine resources for sustainable Development'. One of the key targets of this goal is 'Coverage of 2.5 percent of marine areas of Bangladesh as protected area'. 'SDGs: Bangladesh Progress Report- 2020' discloses that at present, 2.05 percent of marine of Bangladesh is protected.

The goal 15 states that 'Protect, restore and promote sustainable use of terrestrial ecosystem, sustainably manage forests, combat desertification, and halt and reserve land degradation and halt biodiversity loss'. SDGs: Bangladesh Progress Report-2020' reveal that the forest coverage of the country now stands at 17.5 percent which is targeted to increase to 20 percent by 2030.

Conservation of Forest

Bangladesh Forest Department (BFD) implemented different development projects to increase forest resources, conserve wildlife and biodiversity to support the overall development of the country. According to available information, between FY2018-19 total forest land is 25,75,196 hectares which is 17.45 percent of total area of the country. BFD is responsible for conservation and management of 18,80,494 hectares forests. Activities taken by the BFD to conserve forest and biodiversity during FY2020-21are given bellow:

- Forestry Master Plan (2016-2035) has been prepared for the next 20 years to conserve the forest and biodiversity and sustainable management of forests which is under processing for approval.
- In order to conserve the forests effectively, the amended Forest Act 2019 is under the process of ratification.
- 'Prime Minister's National Award for plantation' and 'Bangabandhu Award for Wildlife Conservation' has been announced in order to inspire people and organisation to conserve the forest and wildlife/biodiversity.
- The area of 1,738sq km has been declared as Marine Protected Area (MPA) (Swatch of No Ground) in the South Bay of Bengal. Another MPA of about 1,743 sq.km around the St. Martin Island is under the process of approval.
- Forest Department gradually formulating the master plans for the Protected Areas along with management plans to conserve the forest and wildlife/biodiversity.
- Formulation of co-management committees has been started since 2004 for protected areas co-management to ensure the participation of local people in the conservation of forests and wildlife/biodiversity. Legislative basis has been provided through the approval of co-management Rules-2017.Therefore, the activities of the co-management are strengthened and the jurisdiction of social forestry has been expanded.

National Herbarium

Bangladesh National Herbarium (BNH) conducts taxonomic research on the plant species of the country. Collecting, identifying, preserving and developing database of agricultural, woody, medicinal, threatened and economically important plants through field surveys is the main task of BNH. The institute publishes in a regular basis booklet series called 'Flora of Bangladesh' which includes information about plant species of the country. NH has already implemented a project entitled 'Survey of Vascular Flora of *Chattogram* and the *Chattogram* Hill Tracts' to collect the plant samples through botanical

survey and to publish a pictorial flora of five districts of *Chattogram* and the *Chattogram* Hill Tracts areas *(Chattogram, Cox's Bazar, Bandarban, Khagrachari and Rangamati).*

Bangladesh Forest Research Institute

'Bangladesh Forest Research Institute' is the only national research institute for forest and forest resources. The main task of the institute is to develop innovative technology for increasing production of forest resources and better utilisation of these resources. In addition, the institute works for development and expansion of nursery and forestry strategies to retain some extinct plants. At present, the institute carrying out 54research programmes.

Natural Disaster Management

Bangladesh is one of the most disaster-prone countries in the world. These disasters include the devastating cyclone of 1970 and 1991, cyclone *Sidar* of 2007, *Aila* of 2009 the *Mahasen* of 2013and *Amphan* of 2020 and the horrific floods of 1988, 1998, 2004 and 2007. The 'vision' of the government in disaster management is to strengthen the overall capacity of disaster management, to create a disaster-tolerant country in addition to establishing an emergency response system capable of dealing with risk reduction of the people especially the poor and the vulnerable. With this aim in view, The Ministry of Disaster Management and Relief has been contributing importantly to the country's disaster risk reduction and the implementation of disaster response rehabilitation programmes. Some important measures taken by the ministry has been shown briefly as follows:

Steps for Action, Laws, Rules and Regulations

- Disaster Management Act 2012 has been formulated to provide proper legal framework for ensuring the effective management of disaster and institutional recognition of management of disaster risk, preparation and implementation of national and local planning, protection of life, property and fundamental rights of the people at risk of disaster.
- Standing Orders on Disaster (SOD) 2019 has been published for proper implementation of the responsibility and duties of all ministries, divisions, departments, organisations and individuals related to disaster management and to prepare their own action plans. Such permanent orders also include disasters such as earthquake, tsunamis and fire incidents alongside other common disasters. SOD has been modified including thunderbolt as disaster and incorporating Ward Disaster Management Committee.
- Cyclone Shelters Construction, Maintenance and Management Policy, 2011 is approved to keep the cyclone shelters built by different departments/agencies/authorities at various times in coastal areas useable and maintain and manage them.
- Bangladesh has been a member of the Asian Disaster Reduction Center (ADRC), Regional Integrated Multi-Hazard Early Warning System (RIMES), Asian Ministerial Conference on Disaster Reduction (AMCDR) and INSARAG (International Search and Rescue Advisory Group).
- National Disaster Management Policy 2015 has been published.
- Post Disaster Dead Body Management Guideline, 2016 is published.
- Draft Post-disaster Waste Management Guideline has been finalized.

Steps Related to Planning

- 'Sendai Framework for Disaster Risk Reduction' was adopted in the presence of 187 countries in the World Conference on Disaster Risk Management in March 2015 in *Sendai* city of Japan. According to the framework, preparation of action plan for Bangladesh has been completed.
- Based on the evaluation of the National Disaster Management Plan (2016-2020) the

next National Disaster Management Plan (2021-2025) has been formulated.

- Ministry of Disaster Management and Relief is helping to prepare the SAARC Plan of Action for Disaster Management by coordinating disaster management policy and planning of SAARC member countries.
- National contingency plan has been created for rapid transition from the post-disaster situation including earthquake. Contingency plans of rapid responding organisations like Fire Service and Civil Defense Department, Armed Forces' Division, Department of Disaster Management, Cyclone Preparedness Program (CPP), Dhaka, *Chattogram* and *Sylhet* City Corporation and various health services providing organisations like Power, Titas, T & T and of WASA have been done.

Awareness and Educational Steps/Measures

- Lesson on Disaster management has been included from 3rd grade to 12th class in order to increase disaster awareness among the students. Disaster management and climate change has been included in the curriculum of 41 educational and training institutes in Curriculum for creating skilled manpower for disaster management and climate change.
- A Harmonised Training Module for trainers and trainees has been developed in order to achieve equality and coordination in the training program of government and non-governmental organisations (NGOs).
- Under the National Disaster Management Research and Training Institute (NDMRTI), training has been given to 2,378 persons up to December, 2020 of FY2020-21.

Use of Information and Communication Technology to reduce the risk of disaster

- **Use of Interactive Voice Response (IVR) Technology on Mobile Phones for Sending Disaster Messages:** Disaster message is being circulated in the public understandable language through IVR system.
- **Damage and Need Assessment (DNA) Software:** A web based DNA software has been developed for online transmission and analysis of disaster related information. Besides, Citizen Reporting is included in the software and the public can send their disaster information and photos online. At present, the work of providing training to district relief and rehabilitation officers, *Upazila* executive officers and *Upazila* project implementation officers is going on in this field. Through this software, the information can be sent from the *Upazila*.
- **Establishment of the Multi Hazard Risk and Vulnerability Assessment, Modeling and Mapping (MRVA) Cell:** MRVA Cell has been established under the ECRRP 2007-D1 project in Disaster Management Department. This cell has prepared a map of various calamities, risks and hazards. Using these maps can be taken to reduce the risk of disaster planning, and if it is implemented properly, further disaster damage will be reduced in the future. The products of MRVA have been published on the Disaster Management Department's website.
- **Cyclone Shelter Database:** Detailed information about the cyclone shelters created in coastal areas has been preserved in website based database. In this database, the shelter centers have structural and accessories information such as geographical location (latitude/longitude), usage utility, retention capacity, etc. Information to determine the proper location of the new cyclone shelter, determining the appropriate path for bringing people to the shelter during cyclone and managing the repair and maintenance needs of the shelters can be done by using this database. In addition, every year the southern coastal areas of Bangladesh are flooded by the storm surge

with cyclones, resulting in massive loss of life and livelihoods. This database can be viewed through DNA software.

- **Inundation Depth Map:** The location based depth information of the flood-related flooding in the southern coastal region of the country is based on the data base of the Inundation Map/Risk Map for Storm Surge, how high it will be to build the houses of the houses in these areas, how high the shelter center, the roads or other infrastructure To do it, its ideas can be found.
- **E-Library:** Electronic Libraries have been created so that all publications related to disaster and disaster management are available from one place. There are about 1,000 disaster related publications related to disaster in the e-library.
- **Risk Atlas:** Disaster Map or Risk Atlas is a map of risk of a place, a summary of the risk index, a collection of information on risk organisations, infrastructure, etc. Risk Atlas helps in the analysis of the zigzag map of a specific district, which is your condition (flood depth and circumference, depth of borax and circumference, drought image and peripheral and danger information).

Setting up National Emergency Operation Center (NEOC)

Initiatives have been taken to set up a state-of-the-art National Emergency Operation Center (NEOC) to combat earthquake and other Mega Disasters. Different donor agencies have been contacted to build this building with a capacity to bear earthquake on the Richter scale 7.0. Soon, this will be implemented by a project.

Programmes of Water Development Board to Combat Climate Change Risk

Bangladesh Water Development Board is giving importance to environmental protection in adopting and implementing various development projects and is following the existing environmental laws and policies. Various climate change support infrastructure construction and environment friendly projects will play an important role in the development of our nature and environment. To address the effects of climate change, the Bangladesh Water Development Board, with funding from the Climate Change Trust Fund, has completed 118 projects from FY 2009-10 to February, 2021 at a cost of Tk. 995.77 crore. Implementation of 16 projects at a cost of Tk. 97.94 crore is in progress.

Annexure

Annex 15.1
Ministry/Division wise **Projects and Allocation from BCCTF**

Ministry/Division	Approved Projects	Allocation (In Crore Taka)
Ministry of Water Resources	132	1043.76
Local Government Division	441	1,312.96
Ministry of Environment, Forest and Climate Change	68	415.15
Ministry of Agriculture	21	135.54
Ministry of Disaster Management and Relief	8	125.51
Ministry of Power, Energy and Mineral Resources	3	56.02
Ministry of Shipping	3	51.76
Ministry of Education	29	76.66
Ministry of Defence	9	45.21
Ministry of Health and Family Welfare	3	22.12
Ministry of Science and Technology	2	19.31
Ministry of Women and Children Affairs	2	8.00
Ministry of Chittagong Hill Tracks Affairs	3	8.53
Ministry of Fisheries and Livestock	1	2.00
Ministry of Home Affairs	1	2.00
Ministry of Civil Aviation	1	1.00
Ministry of Public Administration	1	0.19
Total	**728**	3,325.75

Source: Bangladesh Climate Change Trust Fund

Annex15.2
Division-wise Projects and Allocation from BCCTF

Division	Projects	Allocation (In CroreTaka)
Dhaka	122	540.72
Chattogram	131	618.60
Barishal	134	687.59
Khulna	79	282.71
Rajshahi	75	197.43
Rangpur	58	168.27
Sylhet	41	138.97
Mymensingh	31	114.51
Across Divisions	57	576.90
Total	**728**	**3325.75**

Source: Bangladesh Climate Change Trust Fund

Annex 15.3
BCCSAP Thematic Area-wise Projects and Allocation from BCCTF.

Thematic Area	Projects	Allocation (In CroreTaka)	Percent (%) of Total Allocation
Food Security, Social Protection and Health	104	358.80	10.78
Comprehensive Disaster Management	12	158.80	4.80
Infrastructure	395	2025.95	60.91
Research and Knowledge Management	35	131.56	3.95
Mitigation and Low Carbon Development	173	608.62	18.30
Capacity Building and Institutional Strengthening	9	42.01	1.26
Total	**728**	**3325.75**	**100.00**

Source: Bangladesh Climate Change Trust Fund

Annex 15.4
Green Banking and Sustainable Finance

In FY2020-21 (up to December 2020) Banks and Financial Institutes have disbursed Tk. 6304.67 crore in Green Finance. In this fiscal year, banks and FIs have financed Tk. 1,127.45 billion in 32,803 projects out of 39,497 Environmental and Social Due Diligence (ESDD) rated projects. In FY 2020-21 (Up to December 2020), Tk. 68.95 crore has been disbursed by banks and financial institutions from their own climate risk fund.

In order to facilitate green products/sector financing such as solar energy, bio-gas plant, effluent treatment plant, Bangladesh Bank established a revolving refinancing scheme of Tk. 200 crore in 2009 for green products/sector from its own fund.The size of the fund has been increased Tk. 400 crore in view of the growing demand for financing of environment friendly products/initiatives. At present, this scheme is known as 'Refinance Scheme for Environment Friendly Products/Initiatives'. During FY21, under this scheme as refinance against Bank and Financial Institution's financing, total of Tk. 50.70 crore has been disbursed as refinance facility from the fund in green products/initiatives such as Biogas plant, Green Industry, Vermi Compost, Solar Home System, Biological ETP, Solar Mini Grid, Installation of Energy Auditor Certified machineries, and Safety and Work Environment of Factory.

Asian Development Bank (ADB) supported revolving relending facility–Financing Brick Kiln Efficiency Improvement Project was established in Bangladesh Bank in June 2012 with a view to improving the brick sector especially environment friendly brick kilns through efficient use of technology and energy resulting in reduced Green House Gas and Suspended Particulate Matter. The total amount of this relending facility is US$ 50.00 million (equivalent about Tk. 400 crore). The project has two parts: Part-A (ADB Ordinary Capital Resources) conversion of Fixed Chimney Kiln (FCK) to Improved Zigzag Kiln (USD 30.00 million/equivalent Bangladeshi currency) and Part-B (ADB's Special Funds Resources) establishment of new Vertical Shaft Brick Kiln (VSBK), Hybrid Hoffman Kiln (HHK) and Tunnel Kiln(USD 20.00 million/equivalent Bangladeshi currency). Total USD 50.00 million equivalent to Tk. 407.97 crore relending facility has been disbursed to 19 subprojects through 20 Participating Financial Institutions till December 2019. The tenure of the project ended in December 2019 with full disbursement.

Steps have been undertaken during FY 2020-21:

- 'Sustainable Finance Policy' and Methodology of Sustainability Rating for Banks and Financial Institutions have been issued.
- Instruction has been given to establish 'Dedicated Sustainable Finance Help Desk' in the potential office/branches of Banks/FIs.
- To enhance the competitiveness and sustainability of export oriented industries in the international market; a refinancing fund of Tk.1000 (one thousand) crore has been formed in the light of 'Export Policy 2018-2021' by Bangladesh Bank which is named as 'Technology Development/Up-gradation Fund'.
- 'Green Transformation Fund (GTF)' was introduced for widening the scope to manufacturer-exporters irrespective of sectors against import of capital machinery and accessories for implementing specified green/environment-friendly initiatives. US$ 105.32 million and Euro 3.93 million have been disbursed from GTF as of February, 2021.
- Till February, 2021 total Tk. 40.35 crore to 215 Projects has approved as grant from the 'Bangladesh Bank Disaster Management and Social Responsibility Fund' which was formed under CSR activities

Annex 15.5
Government's Plan to Control Air Pollution

Air pollution is a cross-cutting issue, so the government will take the following steps in collaboration with all ministries, departments, agencies and institutions:

Short Term

- To ensure the emission level of the vehicle while issuing the fitness certificate of the vehicle;
- To take appropriate measures to control air pollution caused by ongoing development and construction activities;
- To control the transportation of construction materials such as soil / sand / cement etc. in open trucks;
- Rapid repair of all damaged and broken roads;
- Ensure management of all municipal waste and stop burning of waste;
- continue the campaign against all illegal brick kilns around Dhaka;
- Conduct mobile courts and strict enforcement campaigns against the persons or organizations concerned for air pollution;
- Uncovered spaces on the side of the road are covered with concrete and emphasis is placed on raising awareness;

Mid-term

- To control the pollution caused by vehicles, to remove more polluting vehicles from the roads of Dhaka;
- increase the number of public transport by reducing the use of private cars;
- Increase imports and use of hybrid / electric vehicles;
- Reviewing all types of fuel and vehicle emissions levels and vehicle engine standards (Euro-3/4) to determine the suitability;
- Closing all illegal brickfields in the vicinity of Dhaka;
- Establishment of modern sanitary landfills for waste management;
- Creating emissions inventory to formulate effective action plans on air pollution control;
- The government will install permanent High speed water sprinkler in air pollution prone areas of Dhaka city which will control air pollution by water at high speed from far above.
- Installing Dust Soccer;
- Arranging vacuum sweeping trucks instead of manual sweepers for road cleaning.

Long Term

- These should be implemented expeditiously with emphasis on up-to-date transportation system in Dhaka to control air pollution.
- To increase coordination and awareness among all concerned organizations to prevent air pollution and to ensure accountability.
- To increase the manpower of the Department of Environment in air pollution control and to take activities to increase the capacity and efficiency of the manpower.