TRAINING MODULE ON
RIO CONVENTIONS

Department of Environment

Ministry of Environment, Forest and Climate Change
Government of People's Republic of Bangladesh

May 2019

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Message

I am pleased to know that the Department of Environment (DoE) has prepared the comprehensive training modules on three Rio Conventions. The modules have been prepared through series of consultations and reviews. A six membered Technical Review Committee, headed by Dr. Nurul Quadir, Additional Secretary, Ministry of Environment, Forest and Climate Change (MoEFCC), provided meticulous inputs in shaping the final training modules.

Government of Bangladesh has been addressing the United Nations Conference on Environment and Development (UNCED) since last two decades. Despite many challenges, Bangladesh continued efforts towards mainstreaming the obligations of the Rio Conventions which are UN Convention on Biological Diversity (UNCBD), UN Framework Convention on Climate Change (UNFCCC) and UN Convention to Combat Desertification (UNCCD). In the journey of Rio+20, Bangladesh has successfully adopted policies, prepared action plans and gathered many evidence-based community practices related to the Conventions.

I am pleased to learn that the training modules on Rio Conventions focus on the international processes, national responses and related good practices. I have noted that DoE through Rio project has started using the comprehensive modules in Training of Trainers courses which are exclusively organized for the government officials. Bangladesh Civil Service Administration Academy and National Academy for Planning and Development have incorporated these modules into their regular curriculum. This is a notable achievement. I believe that the training modules on Rio Conventions will, thus, be utilizing as a capacity development tool for mainstreaming the Rio Conventions into national planning process and implementation.

I would like to express my sincere thanks and gratitude to Global Environmental Facility and UNDP Bangladesh for their financial and technical assistance. Thanks to all contributors, editor, reviewers, Dr Sultan Ahmed, Director General of DoE, Md Ziaul Haque, Director, DoE and National Project Director and Rio project team for their valuable contributions making this endeavor a success.

Abdullah Al Mohsin Chowdhury
Secretary
Ministry of Environment, Forest and Climate Change
Government of the People's Republic of Bangladesh

Foreword

The UN Convention on Biological Diversity (UNCBD), UN Framework Convention on Climate Change (UNFCCC) and UN Convention to Combat Desertification (UNCCD) are intrinsically linked and directly contribute to the sustainable development goals (SDGs) 2030. The Rio Conventions are operating in the same ecosystems and addressing interdependent issues of environment at global and national levels. Bangladesh signed and ratified the Rio Conventions during 1992-1996.

The National Capacity Self-Assessment (NCSA) recognised the needs of national capacity development for mainstreaming the obligations of the Rio Conventions into development planning and implementation process. The NCSA identified the need of strengthened national capacity for implementing the Multinational Environmental Agreements at institutional and individual level. The National Capacity Development for Implementing Rio Conventions through Environmental Governance (Rio) project conducted a need assessment at key public training institutes. Assessments found that the capacity of training institutions were limited. The Rio Conventions are not incorporated in most of the training courses. As such, the institutions are not adequately equipped to provide comprehensive training on three Rio Conventions. These findings have led to the preparation of integrated training modules on Rio Conventions.

The training modules on Rio Conventions are aimed to provide a fair understanding to the government officials on biodiversity, climate change, desertification and land degradation Conventions. The training modules have also described the linkages between Five Year Plans and SDGs with Rio Conventions. The modules serve as a reference guide to the trainers and trainees on obligations of three Rio Conventions and mainstreaming.

I am pleased to announce that the comprehensive training modules on three Rio Conventions is first-ever developed in Asia. I hope that the modules will be useful for government officials, project planners and managers, environmental experts and academicians as a ready tool to mainstream the Rio Conventions. I encourage a wider dissemination of the modules. The training modules are available in the website of rio.doe.gov.bd and library of Department of Environment.

I am thankful and grateful to Global Environment Facility (GEF) and United Nations Development Programme (UNDP) for their kind support. I would thank Mr. Md Ziaul Haque, Director, DoE and National Project Director, and Rio project team for a successful completion of this important resource and reference guide.

Dr Sultan Ahmed
Director General
Department of Environment

Acknowledgement

The preparation of comprehensive 'Training Modules' on three Rio Conventions, namely UNFCCC, UNCBD and UNCCD in a single document is the 1st attempt of its kind in Bangladesh by the Rio project. In preparing this important document, the project team and consultants have received invaluable inputs and contributions from series of key informant interviews involving renowned national experts, relevant government officials and academia, consultation meetings with faculty members of key public training institutes, meetings of Technical Expert Group, and above all several meetings of Technical Review Committee formed by the Ministry of Environment, Forest and Climate Change. At the outset, I would like to express my sincere gratitude to those contributors mentioned above for their collective wisdom particularly to the respected members of Technical Review Committee headed by Dr. Nurul Quadir, Additional Secretary, Ministry of Environment, Forest and Climate Change.

I am immensely grateful to the Secretary of Ministry of Environment, Forest and Climate Change Mr. Abdullah Al Mohsin Chowdhury for his overall insightful guidance in preparing this training module. Sincere thanks are also due to Mr. Md. Raisul Alam Mondal, former Director General of the Department of Environment and now Secretary of Ministry of Fisheries and Livestock for his wise guidance. My deep sense of appreciation to the Director General of the Department of Environment Dr. Sultan Ahmed for his invaluable guidance in the process. I would also convey my sincere gratitude to Mr. Aftab Uddin Khan, former Additional Secretary of Ministry of Public Administration for his valuable contributions in structuring the training module and facilitating to conduct Training of Trainers (ToT) on Rio Conventions in Public Training Institutes. I must also thank Global Environment Facility (GEF) and United Nations Development Programme (UNDP), Bangladesh for their financial and technical assistance.

Finally, I would like to gratefully acknowledge the contributions of all conveners and members of Project Steering Committee, Project Implementation Committee, Project Expert Committee for providing guidance and suggestions in shaping up the training module in appropriate fashion. My gratefulness extends to the national consultants and Rio project team for their relentless efforts in documenting and publishing this important resource document.

Md. Ziaul Haque
Director, Department of Environment and
National Project Director, Rio Project

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Glossary[1]

Acceptance and Approval
The instruments of "acceptance" or "approval" of a treaty have the same legal effect as ratification and consequently express the consent of a state to be bound by a treaty. In the practice of certain states acceptance and approval have been used instead of ratification when, at a national level, constitutional law does not require the treaty to be ratified by the head of state.

Accession
Accession is the act whereby a state accepts the offer or the opportunity to become a party to a treaty already negotiated and signed by other states. It has the same legal effect as ratification. Accession usually occurs after the treaty has entered into force. The Secretary-General of the United Nations, in his function as depositary, has also accepted accessions to some conventions before their entry into force. The conditions under which accession may occur and the procedure involved depend on the provisions of the treaty. A treaty might provide for the accession of all other states or for a limited and defined number of states. In the absence of such a provision, accession can only occur where the negotiating states were agreed or subsequently agree on it in the case of the state in question.

Adoption
Adoption is the formal act by which the form and content of a proposed treaty text are established. As a general rule, the adoption of the text of a treaty takes place through the expression of the consent of the states participating in the treaty-making process. Treaties that are negotiated within an international organization will usually be adopted by a resolution of a representative organ of the organization whose membership more or less corresponds to the potential participation in the treaty in question. A treaty can also be adopted by an international conference which has specifically been convened for setting up the treaty, by a vote of two thirds of the states present and voting, unless, by the same majority, they have decided to apply a different rule.

Agreements
Agreement as a generic term: The 1969 Vienna Convention on the Law of Treaties employs the term "international agreement" in its broadest sense. On the one hand, it defines treaties as "international agreements" with certain characteristics. On the other hand, it employs the term "international agreements" for instruments, which do not meet its definition of "treaty". Its Art.3 refers also to "international agreements not in written form". The term "international agreement" in its generic sense consequently embraces the widest range of international instruments.

1 Glossary for MEAs, 2018.
https://www.sprep.org/multilateral-environmental-agreements/glossary accessed on 15 February 2018.
Glossary of terms, UN Treaty Collections, 2018.
https://treaties.un.org/pages/Overview.aspx?path=overview/glossary/page1_en.xml accessed on 10 January 2018.

Amendment
Amendment refers to the formal alteration of treaty provisions affecting all the parties to the particular agreement. Such alterations must be effected with the same formalities that attended the original formation of the treaty. Many multilateral treaties lay down specific requirements to be satisfied for amendments to be adopted. In the absence of such provisions, amendments require the consent of all the parties.

Conference of the Parties (COP)
The supreme body of the Convention. It currently meets once a year to review the Convention's progress. The word "conference" is not used here in the sense of "meeting" but rather of "association". The "Conference" meets in sessional periods, for example, the "fourth session of the Conference of the Parties."

Conventions
Convention as a specific term: Whereas in the last century the term "convention" was regularly employed for bilateral agreements, it now is generally used for formal multilateral treaties with a broad number of parties. Conventions are normally open for participation by the international community as a whole, or by a large number of states. Usually the instruments negotiated under the auspices of an international organization are entitled conventions (e.g. Convention on Biological Diversity of 1992, United Nations Convention on the Law of the Sea of 1982, Vienna Convention on the Law of Treaties of 1969). The same holds true for instruments adopted by an organ of an international organization (e.g. the 1951 ILO Convention concerning Equal Remuneration for Men and Women Workers for Work of Equal Value, adopted by the International Labour Conference or the 1989 Convention on the Rights of the Child, adopted by the General Assembly of the UN).

Entry into Force
The provisions of the treaty determine the date on which the treaty enters into force. Where the treaty does not specify a date, there is a presumption that the treaty is intended to come into force as soon as all the negotiating states have consented to be bound by the treaty. In cases where multilateral treaties are involved, it is common to provide for a fixed number of states to express their consent for entry into force. Some treaties provide for additional conditions to be satisfied, e.g., by specifying that a certain category of states must be among the consenters. The treaty may also provide for an additional time period to elapse after the required number of countries have expressed their consent or the conditions have been satisfied. A treaty enters into force for those states which gave the required consent.

Framework Convention
The adoption of some agreements is meant to provide a decision making and organizational framework for the adoption of subsequent complementary agreements. The former is usually called "framework conventions" and contain obligations of a general institutional nature, often including information-gathering provisions (e.g. Article 4, UNFCCC). These obligations are usually meant as a first step toward the adoption of much more specific obligations (e.g. targets, timetables, mechanisms) in subsequent protocols on the same matter (e.g. Article 3 of Kyoto Protocol).

Multilateral Environmental Agreement (MEA)
A generic term for treaties, conventions, protocols, and other binding instruments related to the environment. Usually applied to instruments of a geographic scope wider than that of a bilateral agreement (i.e., between two States).

Party
Means a State which has consented to be bound by the treaty and for which the treaty is in force.

Protocol
A protocol is generally a subsequent and separate legally binding agreement that adds to or modifies an existing convention only for the States that become Parties to it. The Kyoto Protocol was adopted in 1997, under the UNFCCC, 1992, which is legally binding for the ratifying countries. For example, USA signed the Convention and did not ratify the Kyoto Protocol and hence Kyoto Protocol is not legally binding for USA.

Ratification
Ratification defines the international act whereby a state indicates its consent to be bound to a treaty if the parties intended to show their consent by such an act. In the case of bilateral treaties, ratification is usually accomplished by exchanging the requisite instruments, while in the case of multilateral treaties the usual procedure is for the depositary to collect the ratifications of all states, keeping all parties informed of the situation.

Reservation
Means a unilateral statement, however phrased or named, made by a State, when signing, ratifying, accepting, approving or acceding to a treaty, whereby it purports to exclude or to modify the legal effect of certain provisions of treaty in their application to that State.

Rio Conventions
Three environmental conventions, two of which were adopted at the 1992 "Earth Summit" in Rio de Janeiro: United Nations Framework Convention on Climate Change (UNFCCC), and the Convention on Biodiversity (CBD), while the third, the United Nations Convention to Combat Desertification (UNCCD), was adopted in 1994. The issues addressed by the three treaties are related -- in particular, climate change can have adverse effects on desertification and biodiversity -- and through a Joint Liaison Group, the secretariats of the three conventions take steps to coordinate activities to achieve common progress.

Rio+20
The United Nations Conference on Sustainable Development, to be held in Rio de Janeiro, Brazil, on June 4-6, 2012. The first UN Conference on Sustainable Development was the "Earth Summit", held in 1992, and it spawned the three "Rio Conventions"-- the UNFCCC, the UNCCD, and the UNCBD.

Sustainable Development
Development that meets the needs and aspirations of the current generation without compromising the ability to meet those of future generations.

Sustainable Development Goal (SDG)
The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. These 17 Goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. The goals are interconnected – often the key to success on one will involve tackling issues more commonly associated with another.

Treaty
A treaty is provided in the Vienna Convention on the Law of Treaties (VCLT), adopted in 1969. Article 2(1)(a) of the VCLT stated that, 'an international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments (e.g. Exchange of Notes/Exchange of Letters) and whatever its particular designation".

United Nations Convention on Biological Diversity (**UNCBD**)[2]

Biological Diversity
Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Biological Resources
Biological resource includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.

Biotechnology
Biotechnology means any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.

Country of Origin of Genetic Resources
Country of origin of genetic resources means the country which possesses those genetic resources in in-situ conditions.

Country Providing Genetic Resources
Country providing genetic resources' means the country supplying genetic resources collected from in~situ sources, including populations of both wild and domesticated species, or taken from ex-situ sources, which may or may not have originated in that country.

Domesticated or Cultivated Species
Domesticated or cultivated species means species in which the evolutionary process has been influenced by humans to meet their needs.

Conservation
The management of human use of nature so that it may yield the greatest sustainable benefit to current generations while maintaining its potential to meet the needs and aspirations of future generations.

Conservation of Biodiversity
The management of human interactions with genes, species, and ecosystems so as to provide the maximum benefit to the present generation while maintaining their potential to meet the needs and aspirations of future generations; encompasses elements of saving, studying, and using biodiversity.

2 Convention on Biological Diversity, 1992. https://www.cbd.int/doc/legal/cbd-en.pdf accessed on 15 June 2018.
Glossary of terms, UNCBD, 2018. https://www.cbd.int/invasive/terms.shtml accessed on 15 February 2018.

Convention on Biological Diversity (CBD)
An international legally binding United Nations treaty to deliver national strategies for the conservation and sustainable use of biodiversity. It has three main goals: a. the conservation of biodiversity, b. the sustainable use of the components of biodiversity; and c. the fair and equitable sharing of benefits arising from the use of genetic resources. It is one of the three Rio Conventions and one of the seven international conventions that focus on biodiversity issues.

Ecology
A branch of science concerned with the interrelationship of organisms and their environment; the study of ecosystems.

Ecosystem
Ecosystem means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Ex-situ Conservation
Ex-situ conservation means the conservation of components of biological diversity outside their natural habitats.

Ecosystem Services
Ecosystem services are processes by which the environment produces benefits useful to people, akin to economic services. They include: • Provision of clean water and air • Pollination of crops • Mitigation of environmental hazards • Pest and disease control • Carbon sequestration Accounting for the way in which ecosystems provide economic goods is an increasingly popular area of development. The concept of ecosystem services is similar to that of natural capital. The Millennium Ecosystem Assessment released in 2005 showed that 60% of ecosystem services are being degraded or used unsustainably.

Genetic Material
Genetic material means any material of plant, animal, microbial or other origin containing functional units of heredity.

Genetic Resources
Genetic resource means genetic material of actual or potential value.

Habitat
Habitat means the place or type of site where an organism or population naturally occurs.

In-situ Conditions
In-situ conditions means conditions where genetic resources exist within ecosystems and natural habitats, and. in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

In-situ Conservation
In-situ conservation means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

National Biodiversity Strategy and Action Plan
The Convention on Biological Diversity calls on each of its Parties to prepare a National Biodiversity Strategy and Action Plan (Article 6a) that establishes specific activities and targets for achieving the objectives of the Convention. These plans mostly are implemented by a partnership of conservation organizations. Species or habitats which are the subject of NBSAPs are the governments stated priorities for action and therefore raise greater concern where they are threatened. NBSAPs do not carry legal status and listed species and habitat types are not necessarily protected (although some are covered by other legislation).

Protected Area
Protected area means a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives.

Regional Economic Integration Organization
Regional economic integration organization means an organization constituted by sovereign States of a given region, to which its member States have transferred competence in respect of matters governed by this Convention and which has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to it.

Sustainable Use
Sustainable use means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

Technology
Technology includes biotechnology.

United Nations Framework Convention on Climate Change (**UNFCCC**)[3]

Adaptation
Adaptation to climate change refers to adjustments in human and natural systems in response to actual or expected climatic variation, with a view to moderating harm or exploiting beneficial opportunities.

Adverse Effects of Climate Change
Adverse effects of climate change means change in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare.

Climate Change
Climate change means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

Climate System
Climate system means the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions.

Carbon Footprint
A carbon footprint is historically defined as the total emissions caused by an individual, event, organization, or product, expressed as carbon dioxide equivalent. Greenhouse gases (GHGs), including carbon dioxide, can be emitted through land clearance and the production and consumption of food, fuels, manufactured goods, materials, wood, roads, buildings, transportation and other services. In most cases, the total carbon footprint cannot be exactly calculated because of inadequate knowledge of and data about the complex interactions between contributing processes, including the influence of natural processes that store or release carbon dioxide. For this reason, Wright, Kemp, and Williams, have suggested to define the carbon footprint as: A measure of the total amount of carbon dioxide (CO2) and methane (CH4) emissions of a defined population, system or activity, considering all relevant sources, sinks and storage within the spatial and temporal boundary of the population, system or activity of interest. Calculated as carbon dioxide equivalent using the relevant 100-year global warming potential (GWP100).

Carbon Market
A popular (but misleading) term for a trading system through which countries may buy or sell units of greenhouse-gas emissions in an effort to meet their national limits on emissions, either under the Kyoto Protocol or under

3 United Nations Framework Convention on Climate Change, 1992.
https://unfccc.int/resource/docs/convkp/conveng.pdf accessed on 15 February 2018.
Glossary of climate change acronyms and terms, UNFCCC, 2018.
http://unfccc.int/essential_background/glossary/items/3666.php accessed on 15 February 2018.

other agreements, such as that among member states of the European Union. The term comes from the fact that carbon dioxide is the predominant greenhouse gas, and other gases are measured in units called "carbon-dioxide equivalents.

Emissions
Emissions means the release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time.

Green Climate Fund (GCF)
At COP 16 in Cancun in 2010, Governments established a Green Climate Fund as an operating entity of the financial mechanism of the Convention under Article 11. The GCF will support projects, programmes, policies and other activities in developing country Parties. The Fund will be governed by the GCF Board.

Greenhouse Gases (GHGs)
Greenhouse gases means those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation.

Intergovernmental Panel on Climate Change (IPCC)
Established in 1988 by the World Meteorological Organization and the UN Environment Programme, the IPCC surveys world-wide scientific and technical literature and publishes assessment reports that are widely recognized as the most credible existing sources of information on climate change. The IPCC also works on methodologies and responds to specific requests from the Convention's subsidiary bodies. The IPCC is independent of the Convention.

Kyoto Protocol
An international agreement standing on its own, and requiring separate ratification by governments, but linked to the UNFCCC. The Kyoto Protocol, among other things, sets binding targets for the reduction of greenhouse-gas emissions by industrialized countries.

Mitigation
In the context of climate change, a human intervention to reduce the sources or enhance the sinks of greenhouse gases. Examples include using fossil fuels more efficiently for industrial processes or electricity generation, switching to solar energy or wind power, improving the insulation of buildings, and expanding forests and other "sinks" to remove greater amounts of carbon dioxide from the atmosphere.

Least Developed Country Fund (LDCF)
The LDCF is a fund established to support a work programme to assist Least Developed Country Parties to carry out, inter alia, the preparation and implementation of national adaptation programmes of action (NAPAs). The Global Environment Facility, as the entity that operates the financial mechanism of the Convention, has been entrusted to operate this fund.

Loss and Damage
At COP 16 in Cancun in 2010, Governments established a work programme in order to consider approaches to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change as part of the Cancun Adaptation Framework.

National Adaptation Programmes of Action (NAPAs)
Documents prepared by least developed countries (LDCs) identifying urgent and immediate needs for adapting to climate change.

National Communication
A document submitted in accordance with the Convention (and the Protocol) by which a Party informs other Parties of activities undertaken to address climate change.

Nationally Determined Contributions (NDCs)
According to Article 4 paragraph 2 of the Paris Agreement, each Party shall prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.

Paris Agreement
At COP 21 in Paris, on 12 December 2015, Parties to the UNFCCC reached a landmark agreement to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future. The Paris Agreement builds upon the Convention and – for the first time – brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort.

REDD+
Reducing Emissions from Deforestation and Forest Degradation (REDD) and enhancing forest carbon stock in developing countries.

The term 'REDD+' is used in many ways. A broad definition, based on the official COP13 terminology, holds that REDD+ comprises local, subnational, national and global actions whose primary aim is to reduce emissions from deforestation and forest degradation and enhance forest carbon stocks (increase removals) in developing countries. A narrower definition is that REDD+ also includes results-based or conditional payments, which was a core idea when REDD+ was first launched. From another perspective, REDD+ may not only refer to actions: it may refer to the overall idea, the objective of reduced emissions and increased removals, the set of policies or actions necessary to achieve that objective, the outcome as measured in reduced emissions and increased removals or the process involving all of these elements. REDD (without the plus) is used to refer only to reduced emissions from deforestation and forest degradation and does not include forest carbon stock enhancement.

Regional Economic Integration Organization
Regional economic integration organization means an organization constituted by sovereign States of a given region which has competence in respect of matters governed by this Convention or its protocols and has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to the instruments concerned.

Reservoir
Reservoir means a component or components of the climate system where a greenhouse gas or a precursor of a greenhouse gas is stored.

Sink
"Sink" means any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.

Source
Source means any process or activity which releases a greenhouse gas, an aerosol or a precursor of a greenhouse gas into the atmosphere.

United Nations Convention to Combat Desertification (**UNCCD**)[4]

Affected Areas[4]
Affected areas means arid, semi-arid and/or dry sub-humid areas affected or threatened by desertification.

Affected Countries
Affected countries means countries whose lands include, in whole or in part, affected areas;

Arid, Semi-arid and Dry Sub-humid Areas
Arid, semi-arid and dry sub-humid areas means areas, other than polar and sub-polar regions, in which the ratio of annual precipitation to potential evapotranspiration falls within the range from 0.05 to 0.65.

Combating Desertification
Combating desertification includes activities which are part of the integrated development of land in arid, semi-arid and dry sub-humid areas for sustainable development which are aimed at: a. prevention and/or reduction of land degradation; b. rehabilitation of partly degraded land; and c. reclamation of desertified land.

Desertification
Desertification means land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities.

Developed Country Parties
Developed country Parties means developed country Parties and regional economic integration organizations constituted by developed countries.

Drought
Drought means the naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems.

Drought Risk Management (DRM)
Drought risk management (DRM) is the process of data and information gathering for risk analysis and evaluation; appraisal of options; and making, implementing, and reviewing decisions to reduce, control, accept, or redistribute drought risks. It is a continuous process of analysis, adjustment and adaptation of policies and actions to reduce drought risk, including reducing the vulnerability and enhancing the resilience of the receptors threatened. DRM focuses on delivering a drought-resilient society by reducing drought risks and promoting environmental, societal and economic opportunities

4 United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly In Africa, 1994.
http://www2.unccd.int/sites/default/files/relevant-links/2017-01/UNCCD_Convention_ENG_0.pdf accessed on 15 January 2018.
Frequently asked questions, UNCCD, 2018. http://www2.unccd.int/frequently-asked-questions-faq accessed on 10 January 2018.

Intergovernmental Negotiating Committee on Desertification (INCD)
The INCD was established (General Assembly Resolution 47/188) in early 1993 as a subsidiary body of the United Nations General Assembly with a mandate to negotiate the Convention. It held 10 sessions and prepared for the organization of the first session of the Conference of the Parties to the UNCCD (COP-1). It completed its work in August 1997.

Land
Land means the terrestrial bio-productive system that comprises soil, vegetation, other biota, and the ecological and hydrological processes that operate within the system.

Land Degradation
Means reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as: a. soil erosion caused by wind and/or water, b. deterioration of the physical, chemical and biological or economic properties of soil and c. long-term loss of natural vegetation.

Land Degradation Neutrality (LDN)
A state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems (decision 3/COP.12, UNCCD, 2015a).

Mitigating the Effects of Drought
Means activities related to the prediction of drought and intended to reduce the vulnerability of society and natural systems to drought as it relates to combating desertification.

National Action Programme (NAP)
National Action Programmes are at the heart of the Convention and constitute the conceptual and legal framework for implementing it at the national and local levels. Their purpose is to identify the factors contributing to desertification and the practical measures necessary to combat desertification and mitigate the effects of drought. The Convention indicates that affected countries shall elaborate and implement them with the full participation of local communities and all interested stakeholders. Furthermore, they should be fully integrated with other development programmes.

Regional Economic Integration Organization
Regional economic integration organization means an organization constituted by sovereign States of a given region which has competence in respect of matters governed by this Convention and has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to this Convention.

United Nations Convention to Combat Desertification (UNCCD)
Established in 1994, the United Nations to Combat Desertification (UNCCD) is the sole legally binding international agreement linking environment and development to sustainable land management. The Convention addresses specifically the arid, semi-arid and dry sub-humid areas, known as the drylands, where some of the most vulnerable ecosystems and peoples can be found.

UNCCD Comprehensive Communication Strategy (CCS)
A coordinated plan of action aimed at supporting the implementation of the Convention by according land/soils the attention and priority they deserve in political and economic decisions at the local, national and international levels, in order to support the optimal deployment of The Strategy. It identifies communication goals, target audiences and planned activities.

Introduction

Introduction to the Training Module

The training module on Rio Conventions is structured in 04 modules which further described in several topics with duration of 1.5 hours for each session. The outline of the training module is as below (Table 1):

Table 1: Outline of the Training Module on Rio Conventions

Module 1: An Introduction to MEAs and Rio Conventions	1.1 An Introduction on Multilateral Environmental Agreement (MEA) 1.2 United Nations Conference on Environment and Development (UNCED) 1.3 Introduction to Rio Conventions 1.4 Financing for Multilateral Environment Agreements and Rio Conventions
Module 2: United Nations Convention on Biological Diversity (UNCBD)	2.1 Biological Diversity 2.2 UN Convention on Biological Diversity (UNCBD) 2.3 Protocols of the Convention on Biological Diversity (CBD) 2.4 UNCBD related other MEAs and Synergies 2.5 Implementation of UNCBD 2.6 CBD Related National Policies, Legislations, Strategies 2.7 Linkage Between CBD, NSDS, NBSAP and SDG 2.8 National Progress in Implementing CBD Obligation 2.9 Conservation of Biological Diversity: Good Practices in Bangladesh
Module 3: United Nations Framework Convention on Climate Change (UNFCCC)	3.1 Climate Change 3.2 UN Framework Convention on Climate Change (UNFCCC) 3.3 Climate Change Impacts in Bangladesh: Key Sectors and Vulnerabilities 3.4 National Responses to Climate Change 3.5 Implementation of UNFCCC 3.6 Dealing Climate Change: Good Practices in Bangladesh
Module 4: United Nations Convention to Combat Desertification (UNCCD)	4.1 Land Degradation and Drought 4.2 Overview of Land Degradation in Bangladesh 4.3 Introduction to UN Convention to Combat Desertification (UNCCD) 4.4 COP Decisions, Strategic Framework, and Implementation 4.5 Synergies of CCD with CCC, CBD and SDGs 4.6 National Response 4.7 Combating Land Degradation: Good Practices in Bangladesh

The training modules on Rio Conventions are prepared by specialists of biological diversity, climate change and desertification and land degradation. To prepare the modules, expert's consultations, key informant interviews and desk review have been conducted. List of key informants are provided in Annex I. Relevant officials of Ministry of Environment, Forest and Climate Change (MoEFCC) and Department of Environment (DoE), members of Bangladesh delegation to COP meetings, noted national experts were consulted. The modules have also been reviewed by a six membered Technical Review Committee formed by MoEFCC (Annex II).

Use of the Training Manual

This training manual represents guiding resources and materials of three Rio Conventions: its obligations, relevant policies, decision-making processes and practices from a 360^0 perspective to global environmental challenges. This is prepared for the national counterparts working in the government of Bangladesh, but it can also be used by other development practitioners working in the field of environment particularly biodiversity conversation, climate change desertification and long degradation .

The use of this training manual is two-fold.

- The training manual serves as a quick resource guide to the master trainers to provide condensed knowledge and information on negotiation processes, content, implementation framework and practices of three Rio Conventions which have been converted as an integrated package for adult teaching.
- The training manual serves as a reference guide to the trainees to provide the practical exercises for mainstreaming the obligations of three Rio Conventions into their planning, programmes and projects.

The incorporated modules and exercises are part of the training materials and can be used by individual trainers and trainees by way of reflection on the Rio Conventions, or in discussion groups which would have the added advantage of getting to know various perspectives on the subject matter and ideas on potential strategies.

This training module is available as paper and electronic publication at the

a. Library of
   - Ministry of Environment, Forest and Climate Change, Bangladesh Secretariat,
   - Department of Environment
   - Bangladesh Academy for Rural Development (BARD)
   - Bangladesh Civil Service Administration Academy (BCSAA)
   - Bangladesh Institute of Administration and Management (BIAM)
   - Bangladesh Public Administration Training Center (BPATC)
   - National Academy for Educational Management (NAEM)
   - National Academy for Planning and Development (NAPD)
   - National Agriculture Training Academy (NATA)
   - National Institute of Local Governance (NILG)
   - Rural Development Academy (RDA)

b. Website of
   - Ministry of Environment, Forest and Climate Change (www.moef.gov.bd).
   - Department of Environment (www.rio.doe.gov.bd).

The training manual does not intend to provide an exhaustive discussion of three Rio Conventions and other related issues. It should be utilized as a tool to promote discussion, insights and solutions of crucial planning and programming relating to Rio Conventions.

Notes on Introduction of the Training Manual

MODULE-1

An Introduction to MEAs and Rio Conventions

Overview of the MODULE-1

 **Objectives**	This module on 'An Introduction to MEAs and Rio Conventions' intends to o Provide a historical overview of MEAs o Introduce the Rio Conventions o Provide an overview on key aspects of MEAs o Introduce key institutions and decision-making processes
 **Participants**	The short training program targets the government officials from the concerned ministries, line agencies, departments, trainers and officials of the public training institutions as participants.
 **Training Methodology**	The module intends to enhance knowledge and skills of the government officials and national trainers for developing and implementing the MEAs at the national level. The module will encourage participants to think creatively, absorb quickly by utilizing the contemporary learning methodologies, including: • Presentations and discussions • Interactive lectures • Experience sharing • Feedback from the participants
 **Resource Persons**	Training will be conducted by the renowned resource person(s) having expertise on the subject matter.
 **Expected Learning Outcomes**	By the end of this module, the participants will be able to understand: o History and context of MEAs and Rio Conventions o Process of entrance into force for the MEAs o Institutions and decision-making process of MEAs

Topics	**1.1:** An introduction to Multilateral Environmental Agreement (MEA) o Genesis o UN Conference on the Human Environment, Stockholm 1972 o Brundtland Commission, Our Common Future 1987 o Major Multilateral Environmental Agreement (MEAs) o Institutions and decision-making process of MEA **1.2:** United Nations Conference on Environment and Development (UNCED) 1992 o The Earth Summit Agreements o Agenda 21 o The Rio Declaration o The Forest Principles **1.3:** Rio Conventions **1.4:** Financing for Multilateral Environment Agreements and Rio Conventions
Helpful Tips for Participants	To derive maximum benefits from the training course, please note the following: • Identify areas that you are interested in and see how the deliberations address the issues. • If you want information about certain issues, feel free to share with the resource persons. • Use this forum to share your experiences and opinions with other participants.
Logistics	• Supplies and equipment (whiteboard, multimedia, sound system, computer, wi-fi etc) • Stationeries (markers, paper etc) • Handouts (Training Module)
Duration	1.5 hours

Sessions of the
MODULE-1

Topic 1.1
An Introduction of Multilateral Environmental Agreement (MEA)

A Multilateral Environmental Agreement (MEA) is a generic term for treaties, Conventions, protocols, and other binding instruments related to the environment; usually applied to a geographic scope wider than that of a bilateral agreement (i.e., between two States). The agreements, primarily produced by the United Nations, cover subjects such as atmospheric polices, freshwater policies, hazardous waste and substance policies, the marine environment, nature conservation policies, noise pollution, and nuclear safety. An environmental agreement between the two nations is known as a bilateral environmental agreement (Birnie, 1977). The UN Environment Programme (UNEP) is the main UN organ responsible for the environment and has initiated negotiations of core MEAs. In addition, many specialized agencies and other organs of the United Nations have initiated MEAs and act as hosts to the institutional structures established through MEAs (Fauchald, 2017).

1.1.1 Genesis

During the influx of industrialization in the 19th century, several global environmental challenges had clearly been overlooked. In several ways, these environmental challenges and threats, ranging from pollution, acid rain, deforestation and desertification, destruction of the ozone layer, to early signs of climate change etc. had grown to the level of increasingly unacceptable. The use of multilateral environment agreements began in 1857 when a German agreement regulated the flow of water from Lake Constance to Austria and Switzerland (Kim, 2013). The Bretton Woods Conference in 1945 had first revealed that the World Bank had started to experience an expanded role in intervening with the economic and social policies of the Third World. The initiative to set up the new organization came from UNESCO as a concurrence to encourage international cooperation in the protection of nature, to promote national and international action and to compile, analyze and distribute information (Holdgate, 1999). The International Union for Conservation of Nature (IUCN), founding International Union for the Protection of Nature (IUPN), was established in 1948.

In 1968, Sweden first suggested to the United Nations Economic and Social Council ECOSOC (now UNESCO) the idea of having a UN conference to focus on human interactions with the environment. The General Assembly in 1969 decided to convene a conference in 1972 with the focus on “stimulating and providing guidelines for action by national government and international organizations” facing environmental issues (DeSombre, 2006). Since the emergence of the multilateral environmental agreement there were few agreements signed, however since the creation of the UNEP in 1972 the number of environmental agreements increased enormously.

UN Conference on the Human Environment, Stockholm 1972

The relationship between economic development and environmental degradation was first placed on the international agenda in 1972, at the UN Conference on the Human Environment (UNCHE), popularly known as Stockholm Conference, held in Stockholm, Sweden from June 5–16 in 1972. Representatives from 113 nations and over 400 NGOs attended the Stockholm Conference. The conference produced the Declaration of the Conference on the Human Environment, which stated that every person deserved a clean, healthy environment. The conference also produced an Action Plan, which contained 109 specific recommendations for improving the environment, including limiting the use of ozone-depleting chlorofluorocarbons (CFCs).

After the Conference, Governments set up the United Nations Environment Programme (UNEP), which today continues to act as a global catalyst for action to protect the environment. However, little was done in the succeeding years to integrate environmental concerns into national economic planning and decision-making. Overall, the environment continued to deteriorate, and such problems as ozone depletion, global warming, and water pollution grew more serious, while the destruction of natural resources accelerated at an alarming rate.

By 1983, when the UN set up the World Commission on Environment and Development, environmental degradation, which had been considered a side effect of industrial wealth with only a limited impact, was understood to be a matter of survival for developing nations.

Brundtland Commission, Our Common Future 1987

The mission of the Brundtland Commission, also known as the World Commission on Environment and Development (WCED), is to unite countries to pursue sustainable development together. At the time, the UN General Assembly realized that there was a heavy deterioration of the human environment and natural resources. To rally countries to work and pursue sustainable development together, the UN decided to establish the Brundtland Commission. The General Assembly through a resolution in the fall of 1984 has chosen Ms. Gro Harlem Brundtland the former Prime Minister of Norway because of her strong background in the sciences and public health, to create an organization independent of the UN to focus on environmental and developmental problems and solutions. The Brundtland Commission officially dissolved in December 1987 after releasing Our Common Future, also known as the Brundtland Report, in October 1987, a document which coined, and defined the meaning of the term “Sustainable Development”. The organization Center for Our Common Future was started in April 1988 to take the place of the Commission. The Brundtland Commission was chaired by Ms. Brundtland. Politicians, civil servants, and environmental experts make up most of the members from 21 different nations (both developed and developing countries are included). (https://en.wikipedia.org/wiki/Brundtland_Commission).

Led by Ms. Brundtland, the Commission put forward the concept of sustainable development as an alternative approach based on economic growth — one “which meets the needs of the present without compromising the ability of future generations to meet their own needs”. The Brundtland Report was intended as a response to the conflict between the nascent order promoting globalized economic growth and the accelerating ecological degradation occurring on a global scale. The challenge posed in the 1980s was to harmonize prosperity with ecology.

1.1.2 Major Multilateral Environmental Agreement (MEAs)

Between 1857 and 2010, the number and membership of agreements have increased dramatically since the 1970s and has reached more than 1,250 on a range of subjects—pollution, fisheries, natural resources, toxic substances, wild fauna and flora, regional development, and ecosystems. About a dozen of the existing agreements could be considered truly global as they have universal membership (over 100 countries) and

planetary scope (International Environmental Governance Workshop, 2017). The following table-2 shows the selection of major MEAs with global scope and near universal membership.

Table 2: Major MEAs with Global Scope and Near Universal Membership

Area	Major MEAs	Start Year	Parties No.
Atmosphere	• Paris Agreement on climate change • Kyoto Protocol to the UNFCCC • UN Framework Convention on Climate Change UNFCCC	2015 1997 1992	197 192 197
Biodiversity	• Nagoya Protocol on Access and Benefit-Sharing • Cartagena Protocol on Bio Safety • Convention on Biological Diversity (CBD) • Convention on International wetlands (Ramsar Convention) • Convention on International Trade in Endangered Species (CITIES) • Convention on Conservation of Migratory Species (CMS) • World Heritage Convention	2010 2000 1992 1971 1973 1979 1972	96 171 196 169 183 124 193
Chemicals And waste	• Minamata Convention on Mercury • Stockholm Convention on Persistent Organic Pollutants • Basel Convention on Transboundary Movements of Hazardous Wastes • Rotterdam Convention on Prior Informed Consent Procedure • Vienna Convention and Montreal Protocol on Ozone Layer	2013 2001 1989 1998 1987	54 181 186 157 197
Land	• UN Convention to Combat Desertification (UNCCD)	1994	196
Water	• Convention on the Protection and Use of Transboundary watercourses and international lakes	1992	41

(International Environmental Governance Workshop, 2017)

International environmental law development is one of UNEP's major policy activities, and through the 1997 Nairobi declaration, a central part of the organization's mandate. In contrast to other international organizations, UNEP has not become the organizational home—administratively and physically—for all the conventions that have emerged under its aegis. Once launched, the conventions became autonomous entities with separate legally independent structures, decision-making bodies, and procedures, each with its own Conference of the Parties, secretariat, and subsidiary bodies. Other conventions, however, are completely autonomous, including UNFCCC, UNCCCD, or are hosted by other organizations, World Heritage by UNESCO and Ramsar by IUCN. The following figure 1 depicts key MEAs from 1971 to 2013[3].

Following table 3 shows the dates of ratification/ accession/ adoption of the International Conventions, Treaties and Protocols (ICTPs) by Bangladesh

3 https://www.unitar.org/ksi/international-environmental-and-human-rights-law

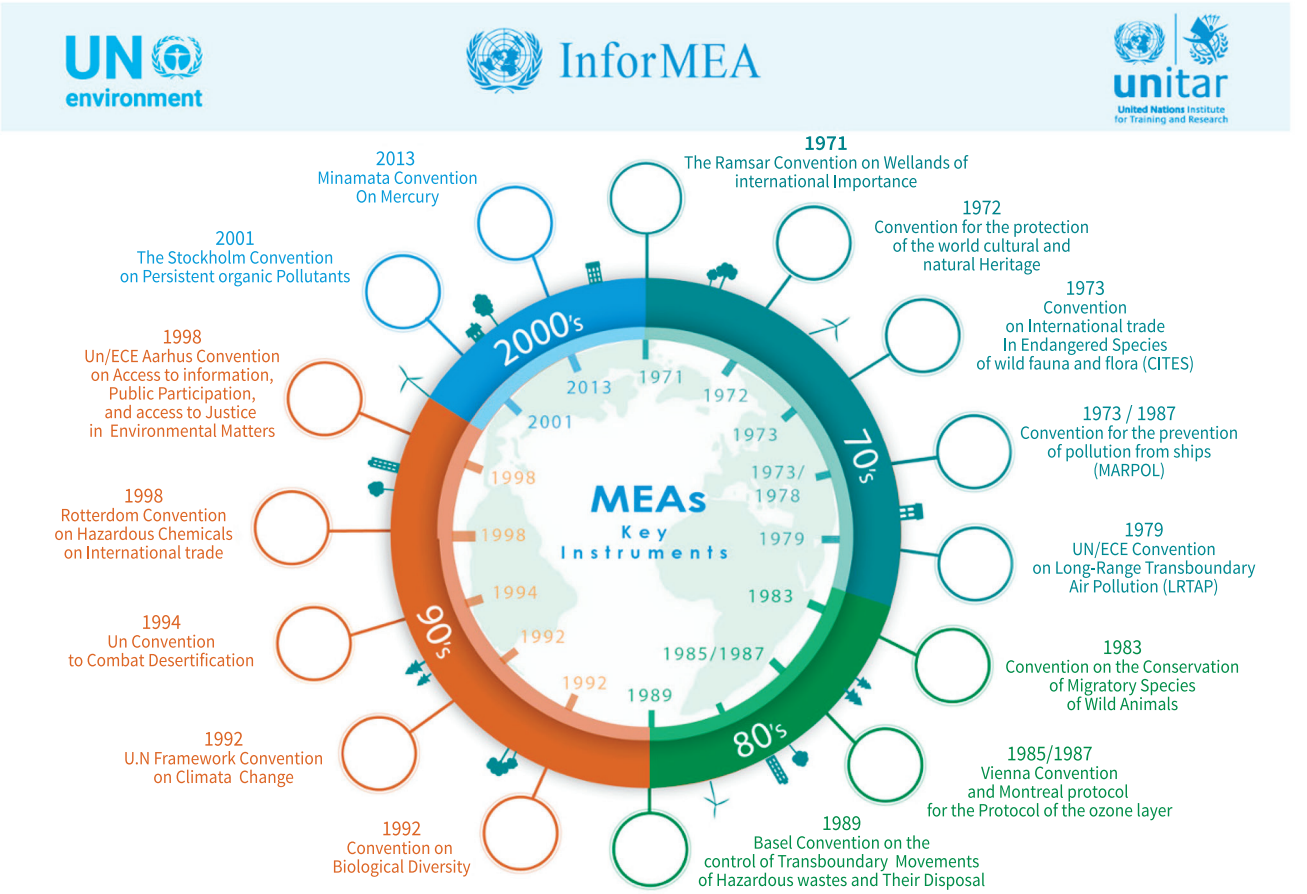

Figure 1: Key Multilateral Environmental Agreements (MEAs) (1971 - 2013)

Table 3: ICTPs by thematic areas ratified by Bangladesh

S/N	Thematic Areas	Name of the Conventions/ Protocols/Treaties	Main Mandate/ Objective(s)	Date of Ratification/ Accession/ Acceptance/ Adoption
1	**Biological Diversity**	Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity *Nagoya, 2010*	Nagoya Protocol is a supplementary agreement to the CBD. It provides a transparent legal framework for the implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources, thereby contributing to the conservation and sustainable use of biodiversity.	Adopted on 29 October 2010 and entered into force on 12 October 2014
2	**Biological Diversity**	Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks *New York, 1995*		05.11.2012
3	**Biological Diversity**	Convention on the Conservation of Migratory Species of Wild Animals - more commonly the Convention on Migratory Species (CMS) or the Bonn Convention, 1979 *Bonn, 1979*		Bangladesh became Party in 01.12.2005

S/N	Thematic Areas	Name of the Conventions/ Protocols/Treaties	Main Mandate/ Objective(s)	Date of Ratification/ Accession/ Acceptance/ Adoption
4	**Biological Diversity**	Cartagena Protocol on Biosafety to the Convention on Biological Diversity *Montreal, 2000*	To help protect the environment and ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health.	24.05.2000 (Signed) 05.02.2004 (Ratified) 05.05.2004 (entry into force)
5	**Biological Diversity**	International Convention on Oil Pollution Preparedness, Response and Cooperation *London, 1990*	Aimed at providing a global framework for international co-operation in combating major incidents or threats of marine pollution.	23.07.2004 (Accession) 23.10.2004 (entry into force)
6	**Biological Diversity**	United Nations Convention on the Law of the Sea *Montego Bay, 1982*	The United Nations Convention on the Law of the Sea lays down a comprehensive regime of law and order in the world's oceans and seas establishing rules governing all uses of the oceans and their resources. It enshrines the notion that all problems of ocean space are closely interrelated and need to be addressed.	27.06. 2001
7	**Biological Diversity**	Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 *New York, 1994*		27.07.2001 (Accession)

S/N	Thematic Areas	Name of the Conventions/ Protocols/Treaties	Main Mandate/ Objective(s)	Date of Ratification/ Accession/ Acceptance/ Adoption
8	**Biological Diversity**	Convention on Biological Diversity, (Brazil, 1992) commonly known as CBD	Conservation of biological diversity (or biodiversity); promote the sustainable use of its components; and encourage fair and equitable sharing of benefits arising from genetic resources.	05.06.1992 (Signed) 03.05.1994 (Ratified)
9	**Biological Diversity**	Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) *Ramsar, 1971*	Conservation and sustainable utilization of wetlands, i.e., to stem the progressive encroachment on and loss of wetlands now and in the future, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value.	20.05.1992 (Acceptance) 21.09.1992 (entry into force)
10	**Biological Diversity**	Convention Concerning the Protection of the World Cultural and natural Heritage *Paris, 1972*	The Convention recognizes the way in which people interact with nature, and the fundamental need to preserve the balance between the two. The Convention defines the kind of natural or cultural sites which can be considered for inscription on the World Heritage List.	03.08.1983 (Acceptance) 03.11.1983 (ratified)
11	**Biological Diversity**	International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties *Brussels, 1969*		04.02.1982

S/N	Thematic Areas	Name of the Conventions/ Protocols/Treaties	Main Mandate/ Objective(s)	Date of Ratification/ Accession/ Acceptance/ Adoption
12	**Biological Diversity**	Convention on International Trade in Endangered Species of Fauna and Flora commonly known as CITES *Washington, 1973*	To protect certain endangered species from over-exploitation by means of a system of import/export permits.	20.11.1981 (Ratified) 18.02.1982 (entry into force)
13	**Biological Diversity**	International Convention for the Prevention of Pollution of the Sea by Oil (as amended on 11 April 1962 and 21 October 1969) *London, 1954*	Objective: To take action to prevent pollution of the sea by oil discharged from ships. Naval ships and ships engaged in whaling are excepted (art. 2).	28.09.1981 (Accession) 28.12.1981 (entry into force)
14	**Climate Change**	Paris Agreement (under United Nations Framework Convention on Climate Change) *Paris 2015*	This Agreement aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by: (a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development. Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.	22.04.2016 (signed) 21.09.2016 (ratified)

S/N	Thematic Areas	Name of the Conventions/ Protocols/Treaties	Main Mandate/ Objective(s)	Date of Ratification/ Accession/ Acceptance/ Adoption
15	**Climate Change**	Stockholm Convention on Persistent Organic Pollutants, 2001	To protect human health and the environment through measures to reduce or eliminate emissions and discharges of persistent organic pollutants (POPs).	23.05.2001 (Signed) 12.03.2007 (Ratified)
16	**Climate Change**	United Nations Framework Convention on Climate Change *New York, 1992*	To stabilize/ reduce greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference (global warming) with the climate system.	09.06.1992 (Signed) 15.04.1994 (Ratified)
17	**Climate Change**	Vienna Convention for the Protection of the Ozone Layer *Vienna, 1985*	To protect human health and the environment against adverse effects resulting from modifications of the ozone layer.	02.08.1990 (Accession) 31.10.1990 (entry into force)
18	**Climate Change**	Montreal Protocol on Substances that Deplete the Ozone Layer *Montreal 1987*	To protect the ozone layer by phasing out the production of numerous substances believed to be responsible for ozone depletion.	02.08.1990 (Accession) 31.10.1990 (entry into force)
19	**Combating desertification**	United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa *Paris, 1994*	To combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.	14.10.1994 (Signed) 26.01.1996 (Ratified) 26.12.1996 (entry into force)
20	**Other related Conventions**	Minamata Convention on Mercury *Kumamoto, 2013*	To protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.	10.10.2013 (signed) Yet to be ratified

S/N	Thematic Areas	Name of the Conventions/ Protocols/Treaties	Main Mandate/ Objective(s)	Date of Ratification/ Accession/ Acceptance/ Adoption
21	**Other related Conventions**	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal *Basel, 1989*	To reduce the movements of hazardous waste between nations and specifically to prevent transfer of hazardous waste from developed to less developed countries (LDCs). The Convention is also intended to minimize the amount and toxicity of wastes generated, to ensure their environmentally sound management as closely as possible to the source of generation, and to assist LDCs in environmentally sound management of the hazardous and other wastes they generate.	01.04.1993 (Accession)

1.1.3 Key Aspects of Multilateral Environmental Agreements (MEAs)

Multilateral Environmental Agreements (MEAs), are autonomous arrangements through which countries agree to meet certain environment-related commitments to avoid, reduce, and manage environmental Pollutions. Since the 1970s a growing number of such agreements have been adopted, and most of them are adopted during the 1990s in response to political pressure for the application of a sustainable development approaches and environmental concerns (LRI, 2012). The MEAs, in general, aims to (UNEP, 2007a):

- Regulate the environmental pollutions
- Deal the cause and consequences of environmental pollutions with regional and global regulatory regime, which origins not only at the local level.

Legal Nature of MEAs

MEAs are international legal instruments that (UNEP, 2007b):

- have a goal of environmental protection and sustainable development;
- take measures to remedy, mitigate or otherwise deal with global and/or regional environmental concerns;
- are concluded between many states or international organizations as Parties;
- can be embodied in a single instrument or more related instruments;
- are governed by international law;
- are concluded in written form.

Forms of MEAs

There are several terms are used to entitle the MEA including 'agreement', 'convention', 'covenant', 'protocol' and 'treaty'. The most commonly used term is the convention, for example, the Convention on Biological Diversity, adopted in 1992. While distinctions can be made, however, the terms treaty and convention are general terms for legally binding agreements between States. The words covenant, or agreement may also be regarded as treaties. States may use the terminology differently, but in all cases, for an agreement to be legally binding, there must be a clear intention by the Parties (UNEP, 2007b). Thereafter a Protocol can be adopted under the Convention. For example, the Kyoto Protocol was adopted in 1997, under the UNFCCC, 1992, which legally binding for ratifying States and hard law in kind of nature. Definitions of a Treaty and a Protocol provided below:

Treaty	The definition of a treaty is provided in the Vienna Convention on the Law of Treaties (VCLT), adopted in 1969. Article 2(1)(a) of the VCLT stated that, 'an international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments (e.g. Exchange of Notes/Exchange of Letters) and whatever its particular designation". Whatever it is called, the essential elements of a Treaty are that "It is an agreement between the States which have decided to so bind themselves, in written form, and Governed by international law".
Protocol	A protocol is generally a subsequent and separate legally binding agreement that adds to or modifies an existing convention only for the States that become Parties to it. The Kyoto Protocol was adopted in 1997, under the UNFCCC, 1992, which is legally binding for the ratifying countries. For example, USA signed the Convention and did not ratify the Kyoto Protocol and hence Kyoto Protocol is not legally binding for USA. An amendment is similar, which also adds to or modifies an existing agreement. But an amendment is not a separate agreement.
Framework Conventions	The adoption of some agreements is meant to provide a decision making and organizational framework for the adoption of subsequent complementary agreements. The former is usually called "framework conventions" and contain obligations of a general institutional nature, often including information-gathering provisions (e.g. Article 4, UNFCCC). These obligations are usually meant as a first step toward the adoption of much more specific obligations (e.g. targets, timetables, mechanisms) in subsequent protocols on the same matter (e.g. Article 3, Kyoto Protocol)
The keys aspects of some other important legal processes related to MEAs are also given below (UNEP, 2007b):	
Full Powers	Means a document emanating from the competent authority of a State designating a person or persons to represent the State for negotiating, adopting or authenticating the text of a treaty, for expressing the consent of the State to be bound by a treaty, or for accomplishing any other act with respect to a treaty.
Reservation	Means a unilateral statement, however phrased or named, made by a State, when signing, ratifying, accepting, approving or acceding to a treaty, whereby it purports to exclude or to modify the legal effect of certain provisions of the treaty in their application to that State
Negotiating State	Means a State which took part in the drawing up and adoption of the text of the treaty
Contracting State	Means a State which has consented to be bound by the treaty, whether or not the treaty has entered into force;

Party	Means a State which has consented to be bound by the treaty and for which the treaty is in force
Third State	Means a State not a party to the treaty
International organization	Means an intergovernmental organization

As a rule, only the Parties to a framework Convention can become Party to a subsequent protocol (though this depends on the text of the convention). In principle, there are no limits to the number of protocols that may be adopted. While there is an expectation that a protocol will be developed following the adoption of a framework convention, nothing precludes Parties to a non-framework convention from deciding to adopt a protocol if they so decide.

Important Elements of MEAs

MEAs need to be agreed between three or more nation states and will be legally binding for those states (UNEP, 2007a). The better-known environmental agreements are multilateral in the sense that they involve many nations and deal with broad aspects of the environment (climate, biodiversity, etc.). However, an MEA can be any treaty between three or more nation-states when this instrument deals with direct environmental objectives .

Legally Binding: Multilateral environmental agreements are legal instruments binding countries that have agreed to become parties through ratification or accession. For the countries which have only signed and not yet ratified, they are nonetheless not expected to do anything that will affect the aims and purposes of the MEA. They are not declarations of intention or statements; they are rules of law. As such, MEA is a powerful tool for the implementation of policies with environmental protection and sustainable development goals. Legally binding and non-legally binding agreements come in many shapes and forms. They can, inter alia, be of the following types or denominated as follows:

Legally binding		Non-Legally binding
• Treaties	• Accords	Resolutions
• Agreements	• Pacts	Decisions
• Conventions	• Charters	Declarations
• Protocols	• Amendments	Recommendations

Hard Law and Soft Law: The terms hard law and soft law are often used to describe the nature of various agreements, particularly with respect to MEA. The idea is that hard law has specific and legally binding obligations, and soft law is either not legally binding or the obligations are flexible or lack specificity. However, a legal obligation is generally considered to be authoritative, prescriptive and binding. So, soft law is considered by many to be a contradiction in terms. Treaty provisions are binding on all Parties to a treaty (unless a Party has made a valid reservation). To many, this means that all treaty provisions should be considered hard law. However, the following distinctions are widely accepted:

- Hard Law: Legally binding; MEAs that conform to the 1969 Vienna Convention on the Law of Treaties and Enforceable in law.
- Soft Law: Non-binding; Global or regional instruments that do not strictly conform to the Vienna Convention but could play a positive role in national policy-making; Important influence on international and national policy and lay the groundwork for multilateral accords.

Processes of entering into Force of MEAs: MEAs enter into force after a series of institutional processes. Subsequently, a global agreement's negotiation and several measures need to be taken at national and international levels to ensure it becomes enforceable. The following processes are required to enter into force of a multilateral agreement internationally (UNEP, 2007a):

Box 1: Processes are Required to Enter into Force of a Multilateral Agreement Internationally.

Adoption

Upon finalizing the negotiation of text, a treaty will be first "adopted" then "signed". This is a proclamation that usually takes place upon the finalization of a conference specially convened to negotiate the treaty. The adoption of the treaty signals the ending of text negotiation and the beginning of the process that an international treaty passes through before enforceability

Signature

A country begins a process of endorsing a treaty by "signing" it. However, for multilateral agreements, this is a necessary but not sufficient step for the application of the treaty. It is understood that when a state becomes a treaty's signatory it expresses its readiness to proceed with the steps needed to fulfill entering into force procedures. This action is at times called "Signature Subject to Ratification, Acceptance or Approval.

Ratification, Acceptance or Approval

Action by which a state specifies its assent to being bound by the treaty after completion of required national constitutional procedures for ratification or accession or approval depending upon the country's legal system. The treaty's depository keeps track of ratification/acceptance/ approval. This is particularly important since a certain quantity of states must ratify a treaty before it enters into force. Ratification and acceptance/approval also implies that a country will enact national implementing legislation to put national effect to the multilateral treaty.

Entry into Force

Normally, multilateral treaties enter into force after an established period has elapsed subsequent to a set number of states ratifying or acceding to the agreement. Some agreements have other terms that must be met so that it enters into force.

Accession

This is the act by which a state accepts to become a party to an agreement whose text has been negotiated, adopted and signed by other countries. Basically, this act has the same denotation as ratification, the only difference being that accession occurs after negotiations have taken place.

Withdrawal or Denouncing

Countries can (and do) withdraw or denounce themselves from some international agreements in accordance with the procedure set in that instrument. If the treaty has a denunciation clause or is silent about this matter, a state may withdraw after a certain period of notice or after consent of contracting parties.

The following figure 2 provides the detail processes of adoption and enter into force of a multilateral agreement internationally:

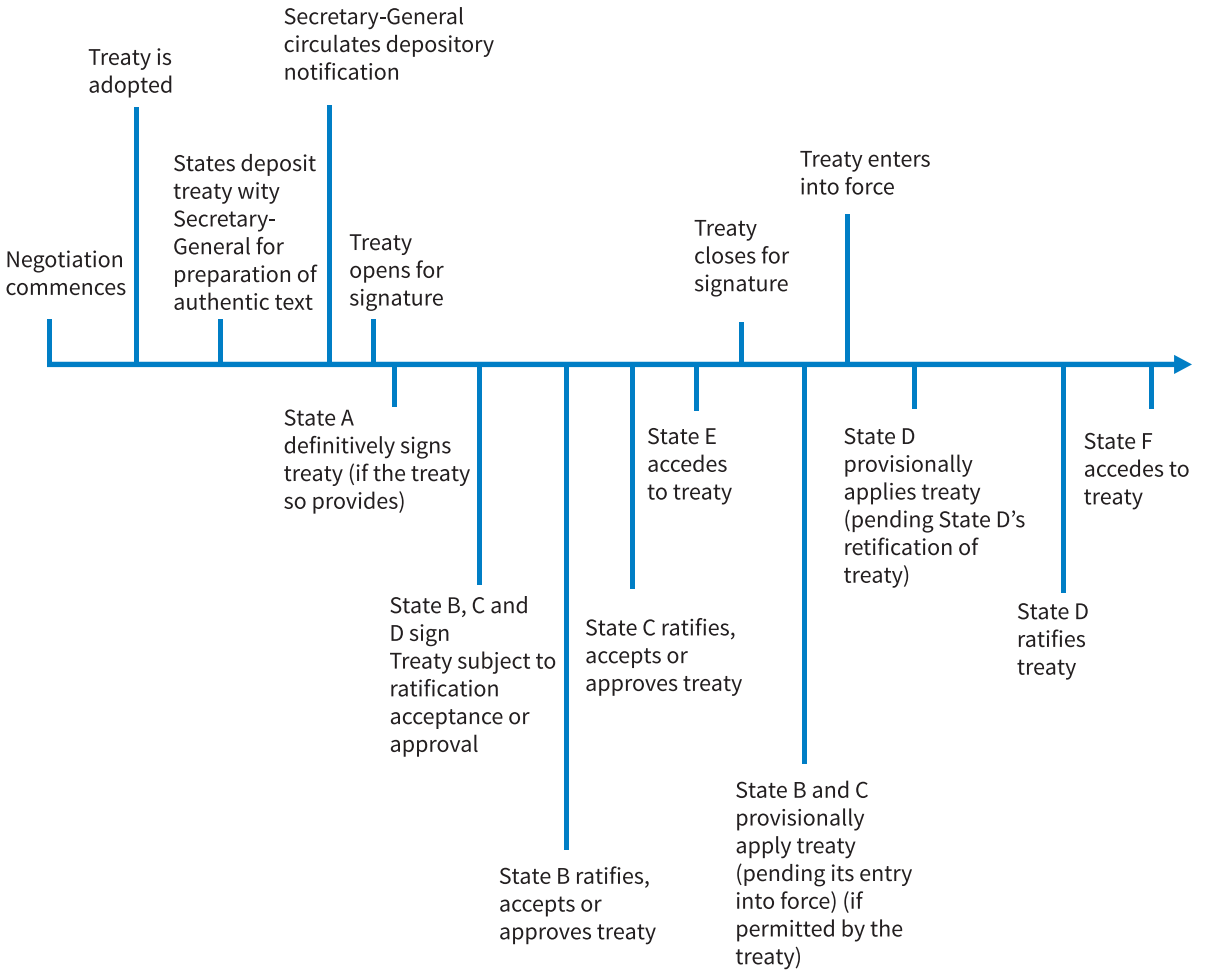

Figure 2: Processes of adoption and enter into force of a MEA

Treaty Handbook United Nations - Office of Legal Affairs Treaty Section[4].

Other Relevant Processes of the Convention

Dispute Settlement: According to the United Nations Charter, Article 33, "peaceful dispute settlement" means solving disputes by negotiation, inquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements, or other peaceful means of the parties' own choice. In a similar way, Article 14 of the Convention governs dispute settlement under the Convention. Article 14.1 commits Parties to seek to settle a dispute over the interpretation or application of the Convention through negotiations or any other peaceful means of their own choice. The Convention further offers Parties two options for a compulsory and binding settlement of disputes, namely compulsory jurisdiction of the International Court of Justice (ICJ) and arbitration. The Convention also provides for conciliation as an option for the non-binding resolution of a conflict. Parties have not yet used the Convention's dispute settlement procedure.

4 www.untreaty.un.org

Amending the Convention: According to Article 15 of the Convention, any Party may propose amendments to the Convention. The Secretariat communicates the text of the proposed amendment to the Parties, to signatories and the Depositary i.e. the United Nations Secretary-General at least six months before the meeting at which it is proposed for adoption. Amendments to the Convention may only be adopted at an ordinary session of the COP (as opposed to an extraordinary session that may be convened in accordance with Article 7.5 of the Convention). The Convention should generally be amended by consensus. If it proves impossible to reach consensus, an amendment may be adopted by a three-fourths majority vote of the Parties present and voting (i.e. actually casting an affirmative or negative vote) as a "last resort". Once adopted, the amendment is communicated by the secretariat to the Depositary who circulates it to all Parties. An adopted amendment must be ratified by three-fourths of the Parties before it enters into force. The amendment enters into force 90 days after the Depositary has received the necessary number of ratification instruments. It binds only those Parties which have accepted it. For Parties accepting the amendment at a later stage, it enters into force 90 days after the Depositary has received their instrument of ratification. No amendment has yet been adopted.

Adopting Protocols: According to Article 17, the Convention may be supplemented with protocols adopted by the COP at any ordinary session. As the Convention does not specify voting rules for the adoption of protocols, the general voting rules of the COP apply. As mentioned in chapter 2, the COP has not yet been able to adopt rules of procedure as envisaged by Article 4.2(k) of the Convention. Continuing disagreement over voting rules means that the draft rules of procedure are applied except for the draft rule on voting. Therefore, all decisions of the COP have to be taken by consensus. To be adopted, "the text of any proposed protocol shall be communicated to all Parties by the secretariat at least six months before a session" (Article 17.2). According to Article 17.3 of the Convention, "the requirements for the entry into force of any protocol shall be established by that instrument," i.e. the protocol. Only Parties to the Convention may be Parties to a protocol; decisions under any protocol shall be taken only by the Parties to the Protocol concerned. So far, Article 17 of the Convention has been employed once. By decision 1/CP.3 of 11 December 1997, COP 3 adopted the Kyoto Protocol unanimously. It entered into force on 16 February 2005, in accordance with Article 25.1 of the Kyoto Protocol which set as the date for the protocol's entry into force "the ninetieth day after the date on which not less than 55 Parties to the Convention, incorporating Parties included in Annex I which accounted in total for at least 55 percent of the total carbon dioxide emissions for 1990 of the Parties included in Annex I, have deposited their instruments of ratification, acceptance, approval or accession".

National Obligations: The phases stated above are the stages that a country meets vis-à-vis the international aspects of a multilateral agreement. Nonetheless, there are also steps that states go through at the national level to provide with domestic effect to the international rule. The nationwide stages vary somewhat from country to country depending upon the national administrative and legal architecture a country possesses regarding international treaties. Some states have a legal system set in their constitution whereby simply ratifying it an accord automatically becomes enforceable within that country. Other countries require parliamentary review and approval of the treaty as well as eventual implementing legislation for the agreement to have a normative effect domestically.

Institutions and Decision-making Process of MEAs

Most international agreements that deal with environmental issues have a series of structures that impel their implementation and uphold or run the activities that arise out of the accord. Although there might be more institutional arrangements than these1, the basic organizational compositions that are set up after an agreement is adopted are:

The Secretariat

Secretariat is set up with manifold mandates, yet all concentrating upon the implementation of the agreement itself. Secretariats provide support for the parties to the conventions in tasks:

- Reporting on compliance;
- Upholding information systems related to the convention and the issue it deals with;
- Employing or fostering financial mechanisms for projects dealing with MEAs implementation;
- Assisting and servicing the periodic meetings of the Conference of the Parties (COP) for MEAs or Meeting of the Parties (MOP) for Protocols or regional agreements.

Conference of the Parties (COP)

The COP is the supreme body of any MEA and the Parties of the Convention meet periodically through Conferences of Parties to assess different aspects and implementation of MEA. The Conferences are open to civil society representatives under certain terms. These conferences have the following goals:

- Appraise the implementation process an MEA is going through at the national level. This is done by evaluating the different reports submitted by national governments to the COP.
- Considers all aspects of the MEA
- Resolve new or additional issues that need to be settled for the implementation of the treaty
- Revise MEAs when and if necessary. Some conventions also consent the COP to add protocols or amend the original treaty where a new state of affairs guarantee it.

Scientific Bodies

Formal scientific bodies authoritatively accompany MEA. They provide a comprehensive evaluation of how the environmental issue that the MEA deals with is being confronted, as well as explore scientific and technical issues related to the agreement's issues. Although nominated by Parties (i.e. countries that are a part of the accord) an MEA's scientific group is meant to act independently in providing its assessments as well as advise. This is an area of a convention where civil society members (many academics) have a strong role to play.

Working Groups

These groups are usually established to look at some key issues on the agenda. After having introduced an item and given delegations the opportunity to state their opening positions on the matter, the Chair may suggest, on his or her own initiative or at the request of one or more Parties, that the item in question be considered in more detail in a working group. This ensures that important issues are carefully considered by a group of interested States while at the same time allowing the Chair to move to the next item on the agenda on the understanding that he or she will return to the deferred item once the working group is ready to report back to the COP or subsidiary body in question.

While the working groups are open-ended, the number of participants to the group will, in practice, vary depending on the number of States interested. The Chair of the COP will normally designate a Chair or, if it is a large group or one that deals with a particularly difficult issue, Co-chairs (see section on the Chair). One should be careful that not too many working groups are in existence at the same time since it could become difficult for many delegations to cover simultaneously any more than one or two groups. Some fora have established specific rules or practices with respect to the number of meetings, e.g. in the UNFCCC process, it is understood that no more than two meetings should occur at the same time. Often a number of groups are created but arrangements are made so that they meet at different times of the day.

COPs and subsidiary bodies can both create working groups when needed. For instance, at the 2nd Meeting of the Ad hoc Open-ended Intersessional Working Group on Article 8(j) and Related Provisions of the CBD, the delegates met in two sub-working groups for most of the meeting to discuss substantive agenda items.

Contact Groups

Parties may set up contact groups to deal with a specific issue that proves difficult to resolve and that could slow down progress on many related issues. The Chair of the COP, or of a subsidiary body or of a working group may suggest a contact group. While such a group may be open-ended, it most often involves the few States that have strongly opposed opinions on an issue. For instance, at COP6 of the Basel Convention, the Working Group on the Strategic Plan created a contact group to develop criteria for the selection of projects under the plan. In addition, two contact groups with related issues may sit as a Joint Contact Group to attempt to resolve differences between them.

Committees

Parties of the MEA can form different committees/bodies to deal with specific issues and provide guidance for implementation for suck issue relevant to the implementation of the MEA. For Example, under UNFCCC different committees and bodies formed with specific tasks and some of them are include Technology Executive Committee (TEC), Advisory Board of the Climate Technology Centre and Network (CTCN), Adaptation Committee, Executive Committee of the Warsaw International Mechanism for Loss and Damage, Standing Committee on Finance (SCF), The Paris Committee on Capacity-building (PCCB), Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE).

UN Regional Groups

The draft rules of procedure refer to the five regional groups that are defined in line with common United Nations practice, namely (Serah, 2017):

a) **The African Group**
This is the largest of the five groups, with 54 member-states from the African continent. It has 28% of all constituent members of the UN. This means that this group carries 28% of all votes. In the UN's Security Council, the African Group has three non-permanent seats. It has 14 reserved positions in the UN Economic and Social Council and 13 seats in the UN Human Rights Council.

b) **The Asia-Pacific Group**
This comprises of 53 member-states derived from Asia and Oceania. Exceptions are Russia, New Zealand, Australia, Israel, and Turkey. The Asia-Pacific group has 3 seats in the Security Council, 2 non-permanent and China's permanent seat. Its seats in the UN Economic and Social Council and the UN Human Rights Council are 11 and 13 respectively.

c) **The Central and Eastern European Group**
As the group with the fewest UN member states (23 members), this group draws its members from Europe and includes Russia from the Asian continent. Its seats in the UN organs are 2 in the Security Council, 6 in the UN Economic and Social Council, and 6 in the UN Human Rights Council.

d) **The Latin America and Caribbean Group (GRULAC)**
It is comprised of 33 states from parts of Central America, South America, and the Caribbean. Its preserved seats in the UN organs are 2 non-permanent in the Security Council, 10 in the UN Economic and Social

Council, and 8 in the UN Human Rights Council. In years ending in 3 and 8, this group is eligible to elect the president of the General Assembly.

e) **The Western European And Others Group (WEOG)**
With 28 members dispersed across the globe, this group holds two nonpermanent seats and 3 permanent seats on the Security Council. On the UN Economic and Social Council and the UN Human Rights Council, this group has 13 and 7 seats respectively. In years ending in 0 and 5, this group is eligible to elect a president of the General Assembly.

The "Others" include Australia, Canada, New Zealand, Turkey, and the United States.

Political Negotiating Groups

Most Parties belong to political negotiating groups, formed based on their common interests. There is no formal process for establishing these groups. Parties decide to form them and inform the COP Bureau, the SBs or the secretariat. They meet informally during sessions of the COP or the SBs. Their purpose is to exchange information and, quite often, to share information on common issues, and, in some instances, develop and agree on common positions. Within the context of UNFCCC negotiations, some of the Political Negotiating Groups are Group of 77 and China, Least Developed Countries (LDCs), The Alliance of Small Island States (AOSIS), European Union (EU), Environmental Integrity Group (EIG).

Topic 1.2
United Nations Conference on Environment and Development (UNCED)

After considering the Brundtland report, 1987 the UN General Assembly called for the UN Conference on Environment and Development (UNCED). The primary goals of the Summit were to come to an understanding of "development" that would support socio-economic development and prevent the continued deterioration of the environment, and to lay a foundation for a global partnership between the developing and the more industrialized countries, based on mutual needs and common interests, that would ensure a healthy future for the planet.

The United Nations Conference on Environment and Development (UNCED) was held on 3-14 June in 1992, in Rio de Janeiro. This conference articulated the key issues related to the global environment and development in the contexts of economics, science and global politics. This conference is also known as the Earth Summit, where 108 leaders of the States agreed to promote sustainable development and expressed their commitments to protect the global environment. Many important documents on the environment came out of the convention and three Rio Conventions viz. UNCBD, UNCCD, and UNFCCC have been adopted.

1.2.1 The Earth Summit Agreements

The Rio Earth Summit adopted the following major agreements aimed at changing the traditional approach to development:

- Agenda 21 — a comprehensive programme of action for global action in all areas of sustainable development;
- The Rio Declaration on Environment and Development — a series of principles defining the rights and responsibilities of States;
- The Statement of Forest Principles — a set of principles to underlie the sustainable management of forests worldwide.
- The Convention on Biological Diversity
- The United Nations Framework Convention on Climate Change
- The United Nations Convention to Combat Desertification (UNCCD) – The Rio Conference called on the United Nations General Assembly to establish an INCD to prepare, by June 1994, a Convention to Combat Desertification, particularly in Africa. The Convention was adopted in Paris on 17 June 1994 and entered into force on 26 December 1996 (http://www2.unccd.int/convention/about-convention/unccd-history).
- Established the Commission on Sustainable Development (CSD).

1.2.2 Agenda 21

The "21" in Agenda 21 refers to 21st Century; is a non-binding action plan of the United Nations about sustainable development divided into 40 chapters that have been grouped into 4 sections:

Section I: Social and Economic Dimensions

Section II: Conservation and Management of Resources for Development

Section III: Strengthening the Role of Major Groups

Section IV: Means of Implementation

The action programme recommends ways to strengthen the part played by major groups— women, trade unions, farmers, children & young people, indigenous peoples, the scientific community, local authorities, industry, and NGOs—in achieving sustainable development. 178 governments voted to adopt the program.

1.2.3 The Rio Declaration on Environment and Development

The declaration supports Agenda 21 by defining the rights and responsibilities of States regarding these issues. Among its principles:

- That human beings are at the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature;
- That scientific uncertainty should not delay measures to prevent environmental degradation where there are threats of serious or irreversible damage;
- That States have a sovereign right to exploit their own resources but not to cause damage to the environment of other States;
- That eradicating poverty and reducing disparities in worldwide standards of living are “indispensable” for sustainable development;
- That the full participation of women is essential for achieving sustainable development;
- That the developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources.

1.2.4 The Statement of Forest Principles

The non–legally binding statement of principles for the sustainable management of forests, was the first global consensus reached on forests. Among its provisions:

- That all countries, notably developed countries, should try to “green the world” through reforestation and forest conservation;
- That States have a right to develop forests according to their socio-economic needs, in keeping with national sustainable development policies; and
- That specific financial resources should be provided to develop programmes that encourage economic and social substitution policies.

Topic 1.3
Introduction to Rio Conventions

1.3.1 UN Convention on Biological Diversity (CBD), 1992

The Convention was opened for signature on 5 June 1992 at the United Nations Conference on Environment and Development (the "Earth Summit"). It remained open for signature until 4 June 1993, by which time it had received 168 signatures. The Convention entered into force on 29 December 1993. The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement which aims to ensure the safe handling, transport, and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health. It was adopted on 29 January 2000 and entered into force on 11 September 2003. The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity is an international agreement which aims at sharing the benefits arising from the utilization of genetic resources in a fair and equitable way. It entered into force on 12 October 2014, 90 days after the date of deposit of the fiftieth instrument of ratification.

1.3.2 UN Framework Convention on Climate Change (UNFCCC), 1992

The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty adopted on 9 May 1992 and opened for signature at the Earth Summit in Rio de Janeiro from 3 to 14 June 1992. It then entered into force on 21 March 1994, after enough countries had ratified it. The Kyoto Protocol was adopted in 1997, entered into force in 2005 and established legally binding obligations for developed countries to reduce their greenhouse gas emissions. In 2015, at COP 21, all 196 parties to the convention came together for the UN Climate Change Conference in Paris 30 November - 12 December and adopted by consensus the Paris Agreement, aimed at limiting global warming to less than two degrees Celsius, and pursue efforts to limit the rise to 1.5 degrees Celsius. The Paris Agreement entered into force on November 4, 2016. It is a legally binding agreement for those countries who ratified this agreement.

1.3.3 UN Convention to Combat Desertification (UNCCD), 1994

The only convention stemming from a direct recommendation of the Rio Conference's Agenda 21, was adopted in Paris, France on 17 June 1994 and entered into force in December 1996. It is the only internationally legally binding framework set up to address the problem of desertification. The Convention is based on the principles of participation, partnership, and decentralization—the backbone of Good Governance and Sustainable Development. It has 196 parties, making it near universal in reach.

1.3.4 Constituted Bodies Under the Convention

Following three bodies were created within the United Nations to ensure full support for the implementation of Rio Conventions worldwide:

- The UN Commission on Sustainable Development, which first met in June 1993;
- The Inter-Agency Committee on Sustainable Development set up by the Secretary-General in 1992 to ensure effective system-wide cooperation and coordination in the follow-up to the Summit; and
- The High-level Advisory Board on Sustainable Development established in 1993 to advise the Secretary-General and the Commission on issues relating to the implementation of Agenda 21.

Topic 1.4
Financing for Multilateral Environment Agreements and Rio Conventions

At the Rio Convention, it was agreed that most financing for Agenda 21 would come from within a country's own public and private sectors. However, new and additional external funds were considered necessary if developing countries were to adopt sustainable development practices.

1.4.1 Global Environment Facility (GEF)

The GEF funds are available to the developing countries and countries with economies in transition to meet the objectives of the international environmental conventions and agreements. GEF support is provided to government agencies, civil society organizations, private sector companies, research institutions, among the broad diversity of potential partners, to implement projects and programs in recipient countries. The GEF has a unique governing structure organized around an Assembly, the Council, the Secretariat, Agencies, a Scientific and Technical Advisory Panel (STAP) and the Evaluation Office. Eighteen institutions act as GEF Agencies (https://www.thegef.org/partners/gef-agencies):

- **Asian Development Bank (ADB)**'s comparative advantage for the GEF includes investment projects at the country and multi-country level in Asia as well as the ability to incorporate capacity building and technical assistance into its projects. The ADB has strong experience in the fields of energy efficiency, renewable energy, adaptation to climate change and natural resources management including water and sustainable land management.
- **African Development Bank (AfDB)**'s comparative advantage for the GEF lies in its capacity as a regional development bank. The AfDB will focus on establishing a track record for environmental projects related to the GEF focal areas of Climate Change (adaptation, renewable energy, and energy efficiency), Land Degradation (deforestation, desertification) and International Waters (water management and fisheries).
- **European Bank for Reconstruction and Development (EBRD**)'s comparative advantage for the GEF lies in its experience and track record in market creation and transformation and ensuring sustainability through private sector and municipal environmental infrastructure projects at the country and regional level in the countries of eastern and central Europe and central Asia, particularly in the fields of energy efficiency, biodiversity and water management.
- **Food and Agriculture Organization of the United Nations (FAO)**'s a comparative advantage for the GEF is its technical capacity and experience in fisheries, forestry, agriculture, and natural resources management. The FAO has strong experience in the sustainable use of agricultural biodiversity, bioenergy, biosafety, sustainable development in production landscapes, and integrated pest and pesticides management.
- **Inter-American Development Bank (IADB)**'s a comparative advantage for the GEF includes investment projects in Latin America and the Caribbean. IDB finances operations related to the following GEF focal areas: Biodiversity (protected areas, marine resources, forestry biotechnology), Climate Change (including biofuels), International Waters (watershed management), Land Degradation (erosion control), and POPs (pest management).
- **International Fund for Agricultural Development (IFAD)**'s a comparative advantage for the GEF lies in its work related to land degradation, rural sustainable development, integrated land management, and

its role in the implementation of the UN Convention to Combat Desertification. IFAD has been working intensively in marginal lands, degraded ecosystems and in post-conflict situations.

- **United Nations Development Programme (UNDP)**'s a comparative advantage for the GEF lies in its global network of country offices, its experience in integrated policy development, human resources development, institutional strengthening, and non-governmental and community participation. UNDP assists countries in designing and implementing activities consistent with both the GEF mandate and national sustainable development plans.
- **United Nations Environment Programme (UNEP)**'s a comparative advantage for the GEF is related to its being the only United Nations organization with a mandate to coordinate the work of the United Nations in the area of environment for which the core business is the field of environment. UNEP also provides the GEF with a range of relevant experiences, proof of concept, testing of ideas, and the best available science and knowledge upon which it can base its investments. It also serves as the Secretariat to three of the MEAs, for which GEF is the/a financial mechanism.
- **United Nations Industrial Development Organization (UNIDO)**'s a comparative advantage for the GEF is that it can involve the industrial sector in GEF projects in the following areas: industrial energy efficiency, renewable energy services, water management, chemicals management (including POP and ODS), and biotechnology. UNIDO also has extensive knowledge of small and medium enterprises (SMEs) in developing and transition economy countries.
- **The World Bank Group (WBG)**'s a comparative advantage for the GEF is as a leading international financial institution at the global scale in a number of sectors, similar to the comparative advantage of the regional development banks. The WBG has strong experience in investment lending focusing on institution building, infrastructure development and policy reform across all the focal areas of the GEF.
- **Conservation International (CI)**: CI works globally with governments and engages with all sectors of society to achieve the ultimate goal of improved human well-being, particularly focusing on the essential services that nature provides. As a GEF Project Agency, they leverage their science, experience in innovative finance and community-based solutions as well as their network of partnerships to implement efficiently in the focal areas of Biodiversity, Climate Change Adaptation and Mitigation, Land Degradation and International Waters.
- **Development Bank of Latin America (CAF)** promotes a sustainable development model through credit operations, non-reimbursable resources, and support in the technical and financial structuring of projects in the public and private sectors of Latin America. They provide sustainable development and regional integration through an efficient mobilization of resources for a timely provision of multiple financial services to clients in the public and private sectors of the shareholder countries.
- **Development Bank of Southern Africa (DBSA)** provides sustainable infrastructure project preparation, finance and implementation support in selected African markets to improve the quality of life of people, accelerating the sustainable reduction of poverty and inequity and promoting broad-based economic growth and regional economic integration. The primary sectors of focus to the DBSA are water, energy, ICT, and transport. The DBSA offers secondary services at the local level, in the health, education and housing sectors.
- **Foreign Economic Cooperation Office, Ministry of Environmental Protection of China (FECO)** mandated to coordinate and manage project funds in cooperation with international financial organizations for the implementation of multilateral environmental agreements and bilateral assistance, as well as other foreign cooperation activities in the field of environmental protection. FECO has a mission to protect the environment by introducing and exchanging knowledge, technologies, and funds.

- **Brazilian Biodiversity Fund (FUNBIO)** promotes the implementation of the CBD, with the mission of providing strategic resources for biodiversity conservation. As a pioneer financial mechanism in Brazil, it creates solutions to the sustainability of conservation and climate change initiatives. FUNBIO has extensive experience in supporting Protected Areas and in the design and management of funds, programs, networks, and environmental projects, in partnership with both public and private sectors and civil society.
- **International Union for Conservation of Nature (IUCN)** is a membership Union composed of both government and civil society organizations. It harnesses the experience, resources, and reaches its more than 1,300 Member organizations and the input of more than 10,000 experts. IUCN is the global authority on the status of the natural world and the measures needed to safeguard it.
- **West African Development Bank (BOAD)** promotes the balanced development of its member states and contributes to the achievement of economic integration in West Africa. It has funded public development projects in infrastructure to support production, rural development, and food security, as well as operations including projects promoted by the private sector. The areas of intervention of the Bank are rural development, food security and environment, industry and agro-industry, infrastructure, transport, hospitality, finance, and other services.
- **World Wildlife Fund (WWF-US)** As a leading international conservation organization, WWF was an active participant in the international negotiations to establish the GEF at the first United Nations Earth Summit in Rio in 1992. WWF has since been a supporter of the GEF's policies and operations, participating in the design or execution of more than 100 GEF programs and projects.

GEF also serves as a financial mechanism for several environmental conventions. The GEF provides funding to assist developing countries in meeting the objectives of international environmental conventions. The GEF serves as "financial mechanism" to five conventions, which are Convention on Biological Diversity (CBD), UN Framework Convention on Climate Change (UNFCCC), Stockholm Convention on Persistent Organic Pollutants (POPs), UN Convention to Combat Desertification (UNCCD), and Minamata Convention on Mercury.

The Conventions, for which the GEF serve as the financial mechanism, provide broad strategic guidance to the two governing bodies of the GEF: the GEF Council and the GEF Assembly. The GEF Council converts this broad guidance into operational criteria (guidelines) for GEF projects[5].

5 https://www.thegef.org/partners/conventions

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Notes on Module-1 of the Training Manual

MODULE-2

United Nations Convention on Biological Diversity **(UNCBD)**

Overview of the MODULE-2

 Objectives	This module on 'Convention on Biological Diversity (CBD)' intends to • Provide a fundamental understanding on the convention of biological diversity • Create a profound understanding on the international CBD regime • Grow a pragmatic perception on the policy responses of CBD • Gain knowledge on the CBD related MEAs, protocols and synergies among them • Inform the evidence-based good practices in Bangladesh relevant to CBD • Provide guidance on key aspects for the preparedness of Bangladesh as a party of the UNCBD
 Participants	The short training program targets the government officials from the concerned ministries, line agencies, departments, trainers and officials of the public training institutions as participants.
 Training Methodology	The purpose of this module is to enhance knowledge and skills of the government officials and national trainers for implementing the CBD in Bangladesh. The module will encourage participants to think creatively, absorb quickly by utilizing the contemporary learning methodologies, including • Presentations and discussions • Interactive lectures • Sharing the experiences • Feedback from the participants
 Resource Persons	Training will be conducted by the renowned resource person(s) having related expertise on the subject matters.

Expected Learning Outcomes	By the end, the participants will be able to understand: • Development and operations of CBD • Obligations and policy responses related to the Conventions • Implementation framework of CBD • Good practices related to CBD in Bangladesh • Progress of Bangladesh in implementing the UNCBD

Topics	1.1 Biological Diversity 1.2 United Nations Convention on Biological Diversity (UNCBD) 1.3 Protocols of the CBD 1.4 CBD related other MEAs and Synergies 1.5 The Implementation Framework 1.6 Linkage of CBD, NSDS, NBSAP and SDGs 1.7 CBD related National Policies, Legislations, Strategies 1.8 National Progress in Implementing CBD Obligations 1.9 Conservation of Biological Diversity: Good Practices in Bangladesh

Helpful Tips for Participants	To derive maximum benefits from the training course, please note the following: • Identify areas that you are interested in and see how the deliberations address the issues. • If you want information about certain issues, feel free to share with the resource persons. • Use this forum to share your experiences and opinions with other participants.

Logistics	• Supplies and equipment (whiteboard, multimedia, sound system, computer, wi-fi etc) • Stationeries (markers, paper etc) • Handouts (Training Module)

Duration	4.5 hours

Sessions of the MODULE-2

Topic 2.1 Biological Diversity

The Earth's biological resources are vital to humanity's economic and social development. The ecological security and livelihood security are critically dependent on biodiversity and its components. Biological diversity is a global asset of tremendous value to present and future generations. However, the threat to species and ecosystems is very high. The Convention on Biological Diversity (CBD) defines biodiversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems". It also refers to the complex relationships among living things, and between living things and their environment.

Biodiversity is therefore, the sum of all life on our planet, and includes all the different species of plants, animals and micro-organisms (estimated at more than ten million species) (Species Diversity), all the genetic variability within these species (estimated at between 10-100,000 genes per species) (Genetic Diversity) and all the diversity of the ecosystems formed by the different combinations of species (Ecosystem Diversity).

- Species Diversity: Refers to the frequency and diversity of different species within a geographic area or an ecosystem, such as mango, tiger.
- Genetic Diversity: Refers to the frequency and diversity of different genes and /or genomes. In the definition of biological diversity, genetic diversity is represented by the phrase "the diversity within species", such as the fazle, lengra, chosa varieties of mangoes.
- Ecosystem Diversity: Refers to the variety and frequency of different ecosystems. An ecosystem is a dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a functional unit, such as the forest ecosystem, the wetland ecosystem.

Biodiversity is important because it underpins ecosystem functioning and the provision of essential ecosystem services. Human well-being depends on this "web of life".

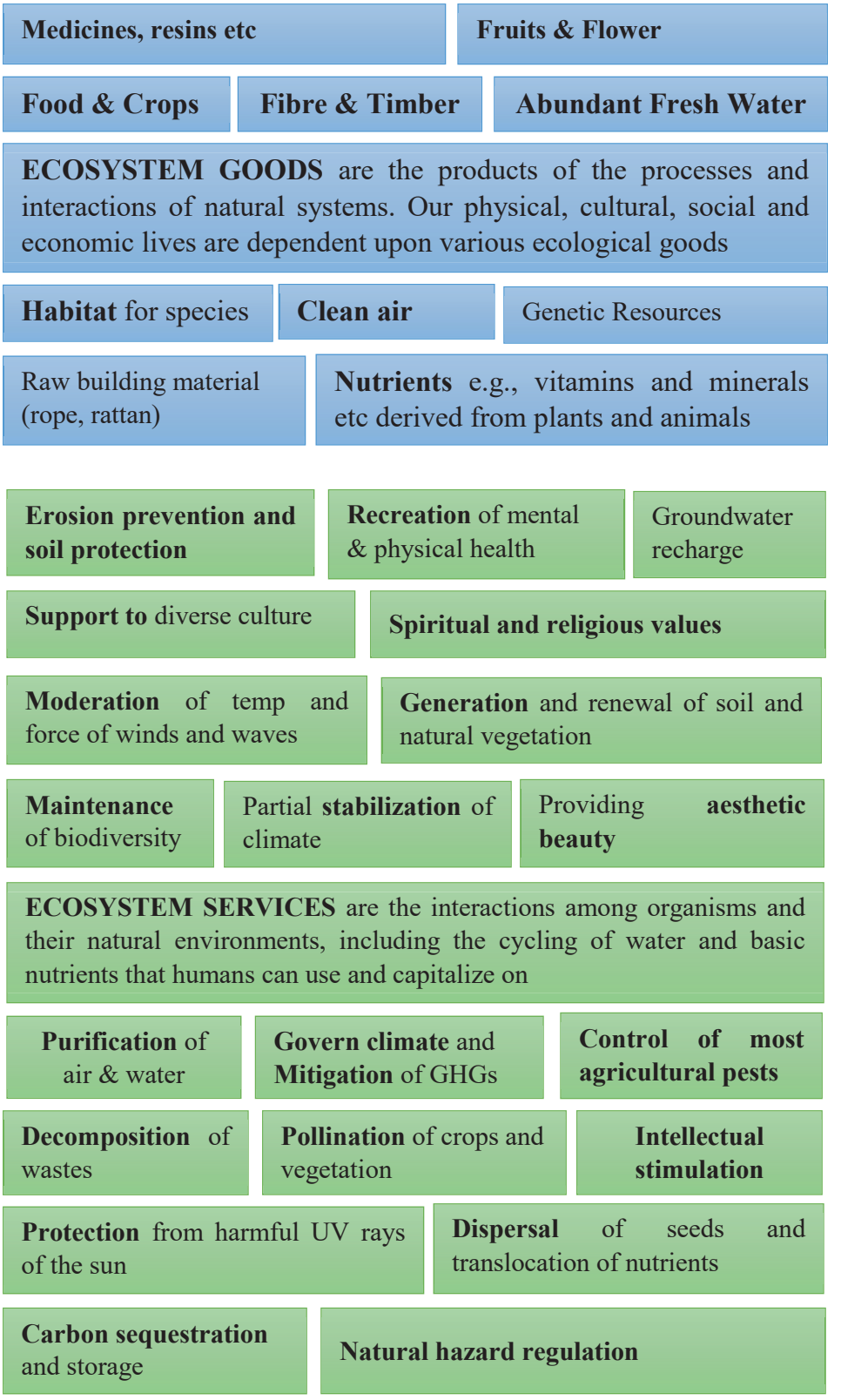

Figure 3: Key goods and services are provided by the ecosystem (Ferdous & Alam 2018)

Threats to Biodiversity

Bangladesh is facing with many direct threats to biodiversity like many other countries. Many of these threats will intensify following accelerating economic development and a growing population. Direct threats are encroachment in forest areas, degradation of forests and wetlands, unplanned infrastructure development, unsustainable exploitation of forest resources, unsustainable fishing practices, change in hydrological regime, pollution and invasive species. The pressures or direct drivers are habitat loss, degradation, and fragmentation, conversion of forest and wetland ecosystems to production units like plantation, agriculture and aquaculture and multiple pressures on ecosystems, such as coral reefs, especially vulnerable to the impacts of climate change[4].

The indirect threats are the institutional and environmental conditions that are behind the direct threats visible on the ground. The main indirect threats include: poor institutional capacity; lack of coordination among different agencies; policy and information gaps; lack of enforcement; inadequate and poorly managed system of Protected Areas; corruption; lack of political commitment; lack of awareness; climate and biophysical changes and lack of alternative livelihoods for the natural resources dependent population. The underlying causes or indirect drivers of biodiversity loss, including the lack of awareness of biodiversity and its values, the values of the ecosystems services and goods are not incorporated into the national accounting systems and decision making for economic development and planning, the subsidies and financial incentives that influence decisions affecting biodiversity, and patterns of consumption and production that determine how natural resources are used to meet the demands of our everyday lifestyles.

Consequence of Biodiversity Loss

Biodiversity loss has negative effects on several aspects of human well-being. Biodiversity has a huge impact on business and industry. The United Nations estimates that annual global economic losses due to deforestation and land degradation alone were between $2 trillion and $4.5 trillion in 2008. If we continue to use our resources in an unsustainable way, it will jeopardize our future (MoEF 2016). Erosion of genetic resources will narrow down the genetic base and limit the scope of future crop development. It is also influencing the environmental conditions.

- Loss of ecosystem services- Protection of water resources, nutrient storage and cycling, pollution breakdown and absorption
- Loss of genetic diversity – genetic diversity allows species to adapt to changing environment al conditions and stresses
- Reduction of food security
- Reduction of health security
- Livelihood insecurity
- Migration and political consequences

If we continue to use our resources in an unsustainable way, it will jeopardize our future. Erosion of genetic resources will narrow down the genetic base and limit the scope of future crop development. It is also influencing the environmental conditions.

4 https://www.cbd.int/gbo/gbo4/publication/gbo4-en.pdf

Topic 2.2
UN Convention on Biological Diversity (UNCBD)

The United Nations Convention on Biological Diversity (CBD) is a legally binding international treaty to promote the following three objectives (Article 2):

a) Conservation of biological diversity;

b) The sustainable use of its components; and

c) The fair and equitable sharing of the benefits arising out of the utilization of the use of genetic resources.

Article 3, the principle the Convention recognizes the "sovereign right" of States to exploit their own resources according to their own environmental policies. It was the first global agreement on the conservation and sustainable use of all components of biodiversity including genetic sources, species, and ecosystems. The CBD was negotiated under the auspices of the United Nations Environment Programme (UNEP) in the period 1989-1992. On 22 May 1992, in Nairobi, the nations of the world adopted a global Convention on Biological Diversity[5].

2.2.1 Genesis

Considering the loss of biodiversity and its consequences, IUCN explored the possibilities for a treaty on the subject and from 1984 to 1987 prepared successive drafts for a treaty on the conservation of biological diversity (Glowka.et. al.1994). In 1987, the UNEP Governing Council recognized the need to increase and streamline international efforts to protect biological diversity. It, therefore, established an ad hoc working group to investigate "the desirability and possible form of an umbrella convention to rationalize current activities in this field and to address other areas which might fall under such a convention" [UNEP Governing Council Res. 14/26 (1987)]. 1st meeting of the group in late 1988 concluded that the existing conventions addressed specific questions of biodiversity conservation but, because of their piecemeal nature, did not adequately meet the needs of conserving biodiversity worldwide.

In response, the United Nations Environment Programme (UNEP) convened the Ad Hoc Working Group of Experts on Biological Diversity in November 1988 to explore the need for an international convention on biological diversity. Soon after, in May 1989, it established the Ad Hoc Working Group of Technical and Legal Experts to prepare an international legal instrument for the conservation and sustainable use of biological diversity. The experts were to consider "the need to share costs and benefits between developed and developing countries" as well as "ways and means to support innovation by local people".

By February 1991, the Ad Hoc Working Group had become known as the Intergovernmental Negotiating Committee. Its work culminated on 22 May 1992 with the Nairobi Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity. The Convention was opened for signature on 5 June 1992 at the United Nations Conference on Environment and Development (the Rio "Earth Summit"). It remained open for signature until 4 June 1993, by which time it had received 168 signatures. The Convention entered into force on 29 December 1993.

5 https://www.cbd.int/information/parties.shtml

2.2.2 Institutional Arrangements

The CBD is governed by the Conference of the Parties (COP) made up of all the Parties to the Convention. At the COP, countries report on steps taken and consider further measures for implementing the provisions of the Convention. In addition to the COP, a Subsidiary Body on Scientific, Technical, and Technological Advice (SBSTTA) has been established to provide advice to the COP. The SBSTTA is also composed of representatives of governments that are Parties and has its own Bureau. SBSTTA generally meets annually and can request the assistance of inter-sessional ad hoc technical expert groups or liaison groups on specific issues. A Secretariat, located in Montreal, Canada, provides administrative support to the Convention under the auspices of the United Nations Environment Program. The Secretariat also manages an electronic clearing-house mechanism to promote and facilitate technical and scientific cooperation[6]

The Secretariat

The CBD Secretariat, based in Montreal, Canada operates under the United Nations Environment Programme. Its main functions are to organize meetings, draft documents, assist member governments in the implementation of the programme of work, coordinate with other international organizations, and collect and disseminate information.

Conference of the Parties (COP)

The convention's governing body is the COP, consisting of all governments (and regional economic integration organizations) that have ratified the treaty. This ultimate authority reviews progress under the Convention, identifies new priorities, and sets work plans for members. The COP can also make amendments to the Convention, create expert advisory bodies, review progress reports by member nations, and collaborate with other international organizations and agreements. The 13th meeting of the Conference of the Parties (COP 13) was held in Cancun, Mexico, in December 2016.

The 14th meeting of the Conference of the Parties (COP 14) was held from 13-29 November 2018, in Sharm El-Sheikh, Egypt, under the theme "Investing in biodiversity for people and planet." It was attended by approximately 3,800 participants representing parties, other governments, international and non-governmental organizations, indigenous peoples and local communities, academia, and the private sector. The Conference on Biological Diversity during the 14th meeting of the COP adopted several decisions on a series of strategic, administrative, financial, and ecosystem-related issues of relevance to the implementation of the Convention and its Protocols. These included 37 decisions under the CBD COP; 16 decisions under the Cartagena Protocol COP/MOP; and 16 decisions under the Nagoya Protocol COP/MOP. Among the highlights, the Conference set up an inter-sessional open-ended working group (OEWG) on the post-2020 global biodiversity framework; established an inter-sessional process, including an Ad Hoc Technical Expert Group (AHTEG) to continue work on digital sequence information (DSI) on genetic resources under the Convention and the Nagoya Protocol; adopted the Rutzolijirisaxik voluntary guidelines for repatriation of traditional knowledge; and extended the online forum and AHTEG on synthetic biology.

The Conference of the Parties uses expertise and support from several other bodies that are established by the Convention. In addition to committees or mechanisms established on an ad hoc basis, two main organs are:

6 http://www.biodiv.org/

Subsidiary Body for Scientific, Technical and Technological Advice (SBSTTA)

The SBSTTA is a committee composed of experts from member governments competent in relevant fields. It plays a key role in making recommendations to the COP on scientific and technical issues.

Working Groups

Other subsidiary bodies have been established by the COP to deal with specific issues as they arise. These are called "ad hoc open-ended Working Groups" because they are established for a limited mandate and period, and because they are open to all Parties as well as the participation of observers. Current Working Groups are:

a. Working Group on Access and Benefit-Sharing is currently the forum for negotiating an international regime on access and benefit sharing
b. Working Group on Article 8 (j) and Related Provisions addresses issues related to
c. protection of traditional knowledge
d. Working group on Protected Areas is guiding and monitoring implementation of the programme of work on protected areas
e. Working Group on the Review of Implementation of the Convention examines the implementation including national biodiversity strategies and action plans, and
f. Open-ended working group (OEWG) on the post-2020 global biodiversity framework

The Groups make recommendations to the COP, and, as is the case for the Working Group on Access and Benefit-Sharing, may also provide a forum for negotiations of an instrument under the Convention.

Expert Groups and Workshops

The COP and SBSTTA may also establish Expert Groups or call for the organization by the Secretariat of liaison groups, workshops, and other meetings. Participants in these meetings are usually experts nominated by governments, as well as representatives of international organizations, local and indigenous communities, and other bodies. Unlike SBSTTA and the open-ended Working Groups, these are usually not considered as intergovernmental meetings.

The purpose of these meetings varies: Expert Groups may provide scientific assessments, for example, while workshops may be used for training or capacity building. The 14th session of the COP has established an Ad Hoc Technical Expert Group (AHTEG) to continue work on digital sequence information (DSI) on genetic resources under the Convention and the Nagoya Protocol. Liaison groups advise the Secretariat or act as for cooperation with other Conventions and organizations.

2.2.3 Thematic Programmes

The Conference of the Parties (COP) has established seven thematic programmes of work (listed below) which correspond to some of the major biomes on the planet.

- Agricultural Biodiversity
- Dry and Sub-Humid Lands Biodiversity
- Forest Biodiversity
- Inland Waters Biodiversity
- Island Biodiversity
- Marine and Coastal Biodiversity
- Mountain Biodiversity

Each programme establishes a vision for, and basic principles to guide future work. They also set out key issues for consideration, identify potential outputs, and suggest a timetable and means for achieving these. Implementation of the work programmes depends on contributions from Parties, the Secretariat, relevant intergovernmental and other organizations. Periodically, the COP and the SBSTTA review the state of implementation of the work programmes.[7]

2.2.4 Cross-Cutting Issues

The COP has also initiated work on key matters of relevance to all thematic areas. These cross-cutting issues correspond to the issues addressed in the Convention's substantive provisions in Articles 6-20 and provide bridges and links between the thematic programmes. Some cross-cutting initiatives directly support work under thematic programmes, for example, the work on indicators provides information on the status and trends of biodiversity for all biomes. Others develop discrete products quite separate from the thematic programmes. The work done for these cross-cutting issues has led to a number of principles, guidelines, and other tools to facilitate the implementation of the Convention and the achievement of the 2010 biodiversity target.[8]

Box 2: Cross-Cutting Issues of UNCBD

- Aichi Biodiversity Targets
- Biological and Cultural Diversity
- Access to Genetic Resources and Benefit-sharing
- Biodiversity for Development
- Climate Change and Biodiversity
- Global Taxonomy Initiative
- Economics, Trade and Incentive Measures
- Ecosystem Approach
- Ecosystem Restoration
- Gender and Biodiversity
- Global Strategy for Plant Conservation
- Communication, Education and Public Awareness
- Health & Biodiversity
- Impact Assessment
- Identification, Monitoring, Indicators and Assessments
- Invasive Alien Species
- Liability and Redress - Art. 14(2)
- New & Emerging Issues
- Peace and Biodiversity Dialogue Initiative
- Protected Areas
- Sustainable Use of Biodiversity
- Technology Transfer and Cooperation
- Tourism and Biodiversity
- Traditional Knowledge, Innovations and Practices - Article 8(j)

2.2.5 Obligations of the Parties Under the Convention

The Convention contains a series of far-reaching obligations related to the conservation of biological diversity and the sustainable use of its components. To understand the inclusion of the CBD in national training organizations in the country, this section examines the CBD obligations and commitments of the country to the Convention.

7 https://www.cbd.int/programmes/
8 https://www.cbd.int/programmes/

The Convention constitutes a framework for actions that take place mainly at the national level. It places few precise binding obligations upon Parties, as encompassed in Articles 6 –15 and Article 26 of the Convention. The Articles are outlined in the following box.

Box 3: CBD Articles and National Obligations

Article 6:	National strategies and plans
Article 7:	Identification and monitoring of biodiversity
Article 8:	Conservation of biodiversity *in-situ*
Article 9:	Conservation of biodiversity *ex-situ*
Article 10:	Sustainable use
Article 11:	Incentive Measures
Article 12:	Research and Training
Article 13:	Public Education and Awareness
Article 14:	Impact Assessment and Minimizing Adverse Impacts
Article 15:	Access to Genetic Resources
Article 26:	Reports

The major commitments by Parties to the Convention include:

- To develop national strategies, plans, etc., for conservation and sustainable use of biodiversity; and to integrate, as far as possible and appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans (Art. 6);
- To identify and monitor the components of biodiversity (Art. 7);
- To establish protected areas or areas where special measures are needed and to regulate or manage biological resources important to biodiversity; to promote the protection of ecosystems and natural habitats (Art. 8);
- To adopt measures for the ex-situ conservation of components of biodiversity (Art. 9);
- To integrate consideration of the conservation and sustainable use of biodiversity resources into national decision-making process (Art. 10);
- To adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity (Art. 11);
- To establish programs for scientific and technical education and training (Art. 12);
- To promote programs for public education and awareness (Art. 13);
- To require an environmental impact assessment that addresses impacts on biodiversity (Art. 14);
- To create conditions to facilitate access to genetic resources on mutually agreed terms, recognizing sovereign rights of States over their natural resources (Art. 15);
- Each Contracting Party is obliged to report regularly on the measures taken to implement the Convention (Art. 26).

Topic 2.3
Protocols of the Convention on Biological Diversity

Article 28 of the CBD on Adoption of protocols, states that the Contracting Parties shall cooperate in the formulation of protocols to this convention. There are two Protocols to the Convention. The Cartagena Protocol on Biosafety and the Nagoya Protocol on Access and Benefit Sharing are supplementary agreements to the Convention.

2.3.1 Cartagena Protocol on Biosafety

The Cartagena Protocol on Biosafety was adopted by the COP on 29 January 2000, which later came into force on 11 September 2003. Bangladesh signed the Protocol in May 2000 and ratified it in February 2004. As of June 2017, the number of Parties to the Protocol is 171. The Protocol has 40 Articles and three Annexes.

The Article 1 of the Protocols states its objectives as, “In accordance with the precautionary approach contained in Principle 15 of the Rio Declaration on Environment and Development, the objective of this Protocol is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.” The Protocol provides an international regulatory framework to reconcile the respective needs of trade and environmental protection with respect to a rapidly growing global industry, the biotechnology industry. The Protocol thus creates an enabling environment for the environmentally sound application of biotechnology, making it possible to derive maximum benefit from the potential that biotechnology has to offer while minimizing the possible risks to the environment and to human health. It seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. It intends to contribute to the safe transfer, handling and use of living modified organisms (LMOs) - such as genetically engineered plants, animals, and microbes - that cross international borders.

The Protocol provides countries the opportunity to obtain information before new biotech organisms are imported. It acknowledges each country’s right to regulate bio-engineered organisms, subject to existing international obligations. It also creates a framework to help improve the capacity of developing countries to protect biodiversity. It establishes an Internet-based “Biosafety Clearing-House” to help countries exchange scientific, technical, environmental and legal information about living modified organisms. It creates an advance informed agreement (AIA) procedure that in effect requires exporters to seek consent from importers before the first shipment of LMOs meant to be introduced into the environment (such as fish for release). It requires bulk shipments of LMO commodities intended for direct use as food, feed or for processing, to be accompanied by documentation stating that such shipments “may contain” living modified organisms and are “not intended for intentional introduction into the environment.” The Protocol establishes a process for considering more detailed identification of LMO commodities in international trade (SCBD 2000)[9].

9 https://bch.cbd.int/protocol/

2.3.2 The Nagoya Protocol

The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity is a supplementary agreement to the Convention on Biological Diversity. The Nagoya Protocol on ABS was adopted at the tenth meeting of the Conference of the Parties on 29 October 2010 in Nagoya, Japan and entered force on 12 October 2014. As of September 2018, 116 countries ratified it. Bangladesh signed it September 2011, not yet ratified. The Protocol has 36 Articles and one Annex.

The Protocol significantly advances the CBD's third objective by providing a strong basis for greater legal certainty and transparency for both providers and users of genetic resources within the scope of CBD's Article 15. The objective stated in Article 1 of the Protocol is the fair and equitable sharing of the benefits arising from the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, considering all rights over those resources and to technologies, and by appropriate funding, thereby contributing to the conservation of biological diversity and the sustainable use of its components. Article 6 of the Protocol upholds the access to genetic resources and states that, in the exercise of sovereign rights over natural resources, and subject to domestic access and benefit-sharing legislation or regulatory requirements, access to genetic resources for their utilization shall be subject to the prior informed consent of the Party providing such resources that is the country of origin of such resources or a Party that has acquired the genetic resources in accordance with the Convention, unless otherwise determined by that Party. And Article 7 recognizes the access to traditional knowledge associated with genetic resources.

Article 15 of the Protocol mandates specific obligations to support compliance with domestic legislation or regulatory requirements of the Party providing genetic resources and contractual obligations reflected in mutually agreed terms are a significant innovation of the Protocol. In addition, the Protocol's provisions on access to traditional knowledge held by indigenous and local communities when it is associated with genetic resources will strengthen the ability of these communities to benefit from the use of their knowledge, innovations, and practices (Article 16). By promoting the use of genetic resources and associated traditional knowledge, and by strengthening the opportunities for fair and equitable sharing of benefits from their use, the Protocol will create incentives to conserve biological diversity, sustainable use its components, and further enhance the contribution of biological diversity to sustainable development and human well-being. This Protocol shall be implemented in a mutually supportive manner with other international instruments (Article 4).

The Conference of the Parties serving as the meeting of the Parties to this Protocol shall keep under regular review the implementation of this Protocol and shall make, within its mandate, the decisions necessary to promote its effective implementation (Article 26)[10].

2.3.3 The Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress

The Nagoya – Kuala Lumpur Supplementary Protocol to the Cartagena Protocol on Biosafety was adopted on 15 October 2010 and entered into force on 05 March 2018. It aims to contribute to the conservation and sustainable use of biodiversity by providing international rules and procedures in the field of liability and redress relating to living modified organisms. Bangladesh has not signed or ratified it yet.[11]

10 www.cbd.int/abs
11 https://bch.cbd.int/protocol/supplementary/about/

Topic 2.4
UNCBD related other MEAs and Synergies

2.4.1 The Ramsar Convention

The Convention on Wetlands, called the Ramsar Convention, is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources. The Convention was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975.

The mission of Ramsar Convention is conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world.

- Number of contracting parties: 169
- Number of Ramsar sites: 2,282
- Total surface of designated sites: 220,667,273 ha[12]

The Convention entered in force into in Bangladesh on 21 September 1992. Bangladesh, currently has 2 sites designated as Wetlands of International Importance (Ramsar Sites), with a surface area of 611,200 hectares.

2.4.2 The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement. The objective of CITES is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. In other words, the objective of CITES is to protect endangered plants and animals. It was drafted because of a resolution adopted in 1963 at a meeting of members of the International Union for Conservation of Nature (IUCN). CITES entered into force on 1 July 1975. As trade in wild animals and plants involves the crossing of borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation. CITES was conceived in the spirit of such cooperation. All import, export, re-export and 'introduction from the sea' of species covered by the Convention has to be authorized through a licensing system. Each Party to the Convention shall designate one or more Management Authorities to grant permits or certificates on behalf of that Party, and one or more Scientific Authorities to provide advice that international trade in any CITES-listed species will not be detrimental to the survival of the species involved. CITES accords different levels or types of protection to roughly 5,600 species of animals and 30,000 species of plants from over-exploitation through international trade[13].

As of 2018, the Convention had 183 parties. Bangladesh ratified the convention in November 1981. The Management Authorities in Bangladesh are – (a) Chief Conservator of Forest, Forest Department, Ministry of Environment and Forest, (b) Chief Controller of Import and Export, Ministry of Commerce. The Scientific Authority in Bangladesh is the Bangladesh Wild Life Advisory Board, Ministry of Environment and Forest. The Enforcement Authority in Bangladesh is the Chief Conservator of Forest, Forest Department, Ministry of Environment and Forest. One Bangladeshi farm has been included in the CITES Register of Captive-breeding Operations in August 2007 for the species of Crocodile. Its name is Reptiles Farm Limited.[14]

12 http://www.ramsar.org/
13 https://www.cites.org/eng/disc/what.php
14 http://www.bangladeshcustoms.gov.bd/trade_info/trade_in_endangered_species

2.4.3 Convention on the Conservation of Migratory Species of Wild Animals

The Convention on the Conservation of Migratory Species of Wild Animals or the Convention on Migratory Species (CMS) or the Bonn Convention aims to conserve terrestrial, marine and avian migratory species throughout their range. CMS brings together the States through which migratory animals' pass, the Range States, and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range. The Convention was signed in 1979 in Bad Godesberg, a suburb of Bonn, and entered into force in 1983. Since the Convention's entry into force, its membership has grown steadily to include over 120 Parties from Africa, Central, and South America, Asia, Europe, and Oceania. Bangladesh became a Party to it in 2005[15].

2.4.4 The World Heritage Convention (WHC)

The most significant feature of the 1972 World Heritage Convention is that it links together in a single document the concepts of nature conservation and the preservation of cultural properties. Objectives of WHC are to identify and conserve the world's cultural and natural heritage for all humanity. The mission is to promote the identification, protection, and preservation of natural and cultural heritage around the world. Cultural heritage includes: "monuments, groups of buildings or sites of historical, aesthetic, archaeological, scientific, ethnological or anthropological value". Natural heritage, on the other hand, is "outstanding physical, biological, and geological features and habitats of threatened plants or animal species and areas of value on scientific or aesthetic grounds or from the point of view of conservation". The Convention recognizes the way in which people interact with nature, and the fundamental need to preserve the balance between the two. Bangladesh accepted the Convention on 3 August 1983. It has two cultural sites, Historic Mosque City of Bagerhat (1985) and Ruins of the Buddhist Vihara at Paharpur (1985), and one natural site, The Sundarbans (1997). There is a scope for cooperation between WHC protection of natural heritage, the Ramsar Convention and the programme of work on protected areas of the Convention on Biological Diversity.[16]

15 http://www.cms.int/en/legalinstrument/cms
16 http://whc.unesco.org/en/list/&order=country#alphaB

Topic 2.5
Implementation of UNCBD

2.5.1 Major COP Decisions

The agenda of the CBD is implemented through the implementation of COP decisions. Article 23 of UNCBD mandates the Conference of Parties (COP) to oversee the process of implementing and further elaborating the CBD. Fourteenth meeting of Conference of Parties (COP 14) was held in Sharm El-Sheikh, Egypt on 17-29 November 2018. Key decisions of COP 14 are presented in the following table 4:

Table 4: Key decisions are adopted in COP14 of UNCBD

Area	Decisions
Decision 14/3 Mainstreaming of biodiversity in the energy and mining, infrastructure, manufacturing and processing sectors	• Decides to establish a long-term strategic approach for mainstreaming biodiversity. • Decides to establish an Informal Advisory Group on Mainstreaming of Biodiversity, to advise the Executive Secretary and the Bureau on further development of the proposal for a long-term approach to mainstreaming biodiversity, with the terms of reference contained in annex II, including on ways to integrate mainstreaming adequately into the post-2020 global biodiversity framework, to be submitted to the Subsidiary Body on Implementation for consideration at its third meeting.
Decision 14/11 Invasive alien species	Decides, subject to the availability of resources, to establish an Ad Hoc Technical Expert Group, with the terms of reference contained in annex II to the present decision, which will meet as needed to ensure timely provision of advice on achieving Aichi Biodiversity Target 9, and, wherever possible, meet back-to-back with other relevant meetings, and requests the Executive Secretary to convene a moderated open online discussion forum to support the deliberations of the Ad Hoc Technical Expert Group;
Decision 14/14 Other matters related to Article 8(j) and related provisions	Decides that the topic for the in-depth dialogue to be held at the eleventh meeting of the Ad Hoc Open-ended Inter-sessional Working Group on Article 8(j) and Related Provisions shall be: "contribution of the traditional knowledge, innovations and practices of indigenous peoples and local communities, and cultural diversity to the post-2020 global biodiversity framework";
Decision 14/17 Integration of Article 8(j) and provisions related to indigenous peoples and local communities in the work of the Convention and its Protocols	• Decides to complete the current programme of work on Article 8(j) and related provisions no later than the fifteenth meeting of the Conference of the Parties;

Area	Decisions
	• Decides to consider the development of a fully integrated programme of work on Article 8(j) and related provisions within the post-2020 biodiversity framework, to allow for the full and effective participation of indigenous peoples and local communities in the work of the Convention, on the basis of achievements to date, taking into account the ongoing and postponed tasks of Parties, also taking into account the 2030 Agenda for Sustainable Development and its goals,2 the Paris Agreement3 under the United Nations Framework Convention on Climate Change, and gaps identified;
Decision 14/19 Synthetic biology	• Decides to extend the Ad Hoc Technical Expert Group on Synthetic Biology with renewed membership, taking into account, inter alia, the work on risk assessment under the Cartagena Protocol, to work in accordance with the terms of reference annexed hereto; • Decides to extend the Open-ended Online Forum on Synthetic Biology, taking into account the work on risk assessment under the Cartagena Protocol, to support the deliberations of the Ad Hoc Technical Expert Group on Synthetic Biology, and invites Parties, other Governments, indigenous peoples and local communities and relevant organizations to continue to nominate experts to take part in the Online Forum on Synthetic Biology;
Decision 14/20 Digital sequence information on genetic resources	• Decides to establish a science and policy-based process on digital sequence information on genetic resources. • Decides to establish an extended Ad Hoc Technical Expert Group, including the participation of indigenous peoples and local communities, and requests the Executive Secretary, subject to the availability of resources: (a) To compile and synthesize the views and information submitted; (b) To commission a science-based peer-reviewed fact-finding study on the concept and scope of digital sequence information on genetic resources and how digital sequence information on genetic resources is currently used building on the existing fact-finding and scoping study; (c) To commission a peer-reviewed study on ongoing developments in the field of traceability of digital information, including how traceability is addressed by databases, and how these could inform discussions on digital sequence information on genetic resources; (d) To commission a peer reviewed study on public and, to the extent possible, private databases of digital sequence information on genetic resources, including the terms and conditions on which access is granted or controlled, the biological scope and the size of the databases, numbers of accessions and their origin, governing policies, and the providers and users of the digital sequence information on genetic resources and encourages the owners of private databases to provide the necessary information;

Area	Decisions
	(e) To commission a peer-reviewed study on how domestic measures address benefit-sharing arising from commercial and non-commercial use of digital sequence information on genetic resources and address the use of digital sequence information on genetic resources for research and development, taking into account the submissions provided in paragraph 9; (f) To convene a meeting of the extended Ad Hoc Technical Expert Group to: (i) Consider the compilation and synthesis of views and information and the peer-reviewed studies referred to above; (ii) Develop options for operational terms and their implications to provide conceptual clarity on digital sequence information on genetic resources, considering in particular the study referred to in paragraph 11(b) above; (iii) Identify key areas for capacity-building; (iv) Submit its outcomes for consideration by a meeting of the open-ended working group established under decision 14/34 to be held prior to the fifteenth meeting of the Conference of the Parties;
Decision 14/22 Resource mobilization	Decides to initiate preparations on this component at an early stage in the process of developing the framework, in full coherence and coordination with the overall process for the post-2020 framework.
Decision 14/24 Capacity-building and technical and scientific cooperation	Decides to consider establishing, at its fifteenth meeting, an informal advisory committee on technical and scientific cooperation, to be operational at the end of the mandate of the current Informal Advisory Committee to the Clearing-house Mechanism in 2020, to provide the Executive Secretary with advice on practical measures, tools and opportunities to promote technical and scientific cooperation for the effective implementation of the Convention.
Decision 14/27 Process for aligning national reporting, assessment and review	Decides to commence with synchronized reporting cycles for the Convention, the Cartagena Protocol and the Nagoya Protocol in 2023, and invites the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol and the Conference of the Parties serving as the meeting of the Parties to the Nagoya Protocol to undertake the preparatory measures necessary for the realization of such synchronized reporting approaches and cycles.
Decision 14/29 Review mechanisms	Decides to include the voluntary peer review as an element of the multidimensional review approach under the Convention, and requests the Executive Secretary to facilitate its operationalization.

Area	Decisions
Decision 14/34 Comprehensive and participatory process for the preparation of the post-2020 global biodiversity framework	• Decides to establish an open-ended intersessional working group to support the preparation of the post-2020 global biodiversity framework as described in the annex to this decision and decides also to designate Mr. Francis Ogwal (Uganda) and Mr. Basile van Havre (Canada) as co-chairs. • Decides that the post-2020 global biodiversity framework should be accompanied by an inspirational and motivating 2030 mission as a stepping stone towards the 2050 Vision "Living in harmony with nature", which will be supported by a coherent, comprehensive and innovative communication strategy.
Decision 14/37 Integrated programme of work and budget for the Convention and its Protocols	• budget for the Convention on Biological Diversity, the Cartagena Protocol on Biosafety and the Nagoya Protocol on Access and Benefit-sharing. • decides to share all costs for secretariat services among the Convention, the Cartagena Protocol and the Nagoya Protocol on a ratio of 74:15:11 for the biennium 2019-2020. • Confirms that, with regard to contributions due from 1 January 2005 onwards, Parties whose contributions are in arrears for two (2) or more years will not be eligible to become a member of the Bureaux of the Convention, its Protocols or the Subsidiary Body on Scientific, Technical and Technological Advice or to nominate a member of a compliance committee, and decides that this will only apply in the case of Parties that are not least developed countries or small island developing States. • Decides that a Party with an agreed arrangement in accordance with paragraph 29 above and that is fully respecting the provisions of that arrangement will not be subject to the provisions of paragraph 28 above. • Decides to adopt an integrated programme of work and Decides to set aside the sum of up to 500,000 United States dollars from the accrued investment revenue of the BE fund, without prejudice to bilateral agreements that restrict the usage of interest accrued on particular voluntary contributions, that could potentially be drawn on if, in the opinion of the Executive Director of the United Nations Environment Programme, exceptional circumstances arise regarding the facilitation of the participation of developing country Parties, in particular the least developed countries and the small island developing States, as well as Parties with economies in transition, for priority meetings identified in the core budget for the biennium 2019-2020, and invites the Executive Director, if s/he is satisfied regarding the exceptional need for and the compatibility of such a draw-down with the Financial Rules and Regulations of the United

Area	Decisions
	Nations Environment Programme, to authorize the Executive Secretary to draw on the set-aside, in consultation with the Bureau and subject to subsequent reimbursement through new voluntary contributions to the BZ Fund, and to submit a direct report to the Parties to the Convention and Parties to the Protocols at their next meetings.
Decision 14/38 Date and venue of future meetings of the Conference of the Parties	Decides that the sixteenth meeting of the Conference of the Parties, the eleventh meeting of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol and the fifth meeting of the Conference of the Parties to the Nagoya Protocol should be held in the last quarter of 2022.

2.5.2 Financial Mechanism[17]

Operations of the Financial Mechanism

Articles 20 and 21 of the Convention on Biological Diversity, Article 28 of the Cartagena Protocol on Biosafety and Article 25 of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization set out the framework of financing agenda under the Convention. The Memorandum of Understanding between the Conference of the Parties to the Convention and the Council of the Global Environment Facility, contained in decision III/8, provides legal basis for the relationship between the Convention and the Facility, including role and responsibilities of each institution.

Article 21, paragraph 1: “There shall be a mechanism for the provision of financial resources to developing country Parties for purposes of this Convention on a grant or concessional basis the essential elements of which are described in this Article. The mechanism shall function under the authority and guidance of, and be accountable to, the Conference of the Parties for purposes of this Convention. The operations of the mechanism shall be carried out by such institutional structure as may be decided upon by the Conference of the Parties at its first meeting. For purposes of this Convention, the Conference of the Parties shall determine the policy, strategy, programme priorities and eligibility criteria relating to the access to and utilization of such resources. The contributions shall be such as to take into account the need for predictability, adequacy and timely flow of funds referred to in Article 20 in accordance with the amount of resources needed to be decided periodically by the Conference of the Parties and the importance of burden-sharing among the contributing Parties. Voluntary contributions may also be made by the developed country Parties and by other countries and sources. The mechanism shall operate within a democratic and transparent system of governance.

Relevant Financial Institutions

Article 21, paragraph 4: “The Contracting Parties shall consider strengthening existing financial institutions to provide financial resources for the conservation and sustainable use of biological diversity.”

The term “financial institutions”, referred to in Article 21, paragraph 4, of the Convention, has not been explicitly defined so far for purposes of implementing this provision. In the business world, a financial institution is an establishment that conducts financial and monetary transactions, such as deposits, loans, investments and currency exchange. The major categories of financial institutions include

17 https://www.cbd.int/financial/ accessed on 27 May 2019

- banks,
- asset management companies,
- insurance companies,
- brokerage firms and
- investment dealers.

A development finance institution provides finance that promotes development and helps the private sector to invest, especially in the developing countries. Development finance institutions are mostly backed by Governments, especially by Governments with developed economies, including multilateral development banks, bilateral development banks, microfinance institutions, community development financial institution and revolving loan funds. A national development bank is a finance institution, created by a country's government, which provides financing for the purposes of economic development of the country. An international development financial institution is a financial institution that has been established (or chartered) by more than one country, such as

- multilateral development banks,
- Bretton Woods institutions,
- regional development banks,
- bilateral development banks and agencies, and
- other regional financial institutions.

According to the various documents prepared for the previous meetings of the Conference of the Parties, including monitoring of funding status and trends for biodiversity, the following financial institutions have been of particular importance to financing for biodiversity and associated ecosystem services:

a. Global Environment Facility - a systemically important financial institution, which would pose a serious risk to the Convention in the event of its collapse;

b. Green Climate Fund - an increasingly important financial institution, which can finance the interface between climate change and biodiversity;

c. Development financial institutions - a potentially important set of financial institutions, which can finance biodiversity and ecosystem services, both directly and indirectly;

d. Market-based financial institutions – an ultimately important set of financial institutions, which remain to be tapped at a meaningful magnitude;

e. Institutionalized funds - an optionally important set of multi-donor nature funds, single donor nature funds, and environment funds, that can be tailored to fit with specific requirements of various public and private donors.

2.5.3 Clearinghouse Mechanism: Towards A Biodiversity Knowledge Network for Scientific and Technical Cooperation

The Clearing-House Mechanism (CHM) of the Convention on Biological Diversity has been established further to Article 18.3 of the Convention. Further to decision X/15, its mission is to contribute significantly to the implementation of the Convention on Biological Diversity and its Strategic Plan for Biodiversity 2011-2020, through effective information services and other appropriate means in order to promote and facilitate scientific and technical cooperation, knowledge sharing and information exchange, and to establish a fully operational network of Parties and partners.

This mission is articulated around three major goals:

Goal-1 The central clearing-house mechanism provides effective global information services to facilitate the implementation of the Strategic Plan for Biodiversity 2011-2020.

Goal-2 National clearing-house mechanisms provide effective information services to facilitate the implementation of national biodiversity strategies and action plans.

Goal-3 Partners significantly expand the clearing-house mechanism network and services.

The implementation activities of the Clearing-House Mechanism have been guided by the Conference of the Parties. The Clearing-House Mechanism consists of the following components:

- The CBD website, (https://www.cbd.int/), acting as the central node.
- The network of national Clearing-House Mechanisms.
- Various partner institutions.

The Clearing-House Mechanism is constantly being improved to better contribute to the implementation of the Strategic Plan for Biodiversity 2011-2020 and the achievement of the Aichi Biodiversity Targets. A list of priority activities has been defined, and a description of the information services are provided by the central Clearing-House Mechanism.[18]

Bangladesh Clearing House Mechanism (BDCHM)

The Bangladesh Clearing House Mechanism (CHM) is web-based platform to provide update on the biodiversity related information of the country. This is established as per the article 18.3 of the Convention to facilitate and promote technical and scientific co-operation. In addition, the CHM will facilitate access to information on the status of biodiversity and biodiversity management initiative in Bangladesh. It will contribute to the dissemination of biodiversity related programme and raising public awareness. DoE will be administering the operation and maintenance of the BCHM web-based database.

The following information will be available in the BDCHM web site:

- Biodiversity National Assessment Report
- NBSAP
- CBD thematic issues
- CBD cross-cutting issues
- Biodiversity related committee report
- Budget allocation for Biodiversity/Biodiversity related programme! project
- Scientific Journal! technical report
- Status of biodiversity (floral and faunal data, Red list etc)
- Protected Areas! ECAs management status
- Institutional capacity and capacity needs

Beyond CBD, CHM will also be linked and inter-connected with the biodiversity related other

conventions like Convention on Wetlands of International Importance or the Ramsar Convention, Convention on International Trade in Endangered Species of Wild Fauna and Flora, Convention on the Conservation of Migratory Species of Wild Animals, etc.

18 https://www.cbd.int/chm/

Topic 2.6
CBD Related National Policies, Legislations, Strategies

2.6.1 Policies

Biodiversity Conservation and sustainable use issues should be resonated in all concerned policies of various ministries of the government. It has been observed that the policies, rules-regulations implemented by offered ministries have still had to do a lot in terms of inserting text relevant to conservation of biodiversity. Following policies have some elements related to the CBD:

The National Fisheries Policy, 1998

National Fisheries Policy, 1998 recognizes that fish production has declined due to environmental imbalances, adverse environmental impact and improper implementation of fish culture and management programs. The policy particularly focuses on aquaculture and marine fisheries development. It establishes the framework for conservation and management of fisheries and conservation of fish populations. The policy suggests biodiversity to be maintained in all-natural water bodies and in the marine environment.

The National Water Policy, 1999

The National Water Policy, 1999 aims to provide guidance to the major players in the water sector for ensuring optimal development and management of water. Section 4.9 of the Policy states that fisheries and wildlife will receive due emphasis on water resource planning, and water development plan will not interrupt with fish migration and breeding.

The National Land Use Policy, 2001

The National Land Use Policy, 2001 aims at managing land use effectively to support trends in accelerated urbanization, industrialization, and diversification of development activities. It has mentioned about the conservation for forest land. It stated that proper implementation of forest policy and environment policy will bring overall improvement of the situation. It suggested for land zoning and promulgation of a zoning law.

The National Livestock Development Policy, 2007

The National Livestock Development Policy, 2007 addresses the key challenges and opportunity for comprehensive sustainable development of the livestock sub-sector in the country. Conservation and utilization programme of potential indigenous breeds for subsistence farming to be developed.

Biosafety Guidelines of Bangladesh, 2007

Considering the obligation of the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, the Biosafety Guidelines of Bangladesh, 2007 has been formulated by the Ministry of Environment and Forest. In developing the Guideline, the National Policy on Biotechnology has been taken into consideration and recast various aspects of Risk Assessment and Risk Management in the light of the Cartagena Protocol. Biosafety guidelines are applicable to all research and development activities of modern biotechnology conducted in laboratories of the government research institutes, state enterprises, universities, international organizations located in Bangladesh, private companies or non-governmental organizations. It applies to laboratory and field trial, trans-boundary movement, transit, handling and use of all GMOs/LMOs that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health.

This guideline covers aspects of risk assessment and safety requirements needed for undertaking (a) Laboratory work, (b) Field trial and (c) Commercial use, involving i) Microorganisms ii) plants and iii) Animals. Guidelines for laboratory work specify the experiments to be categorized as belonging to different biosafety levels like work bearing minimal risk, work bearing low risk, considerable risk and work bearing high risk and what precautionary measures should be taken to avert such risk.

The National Agricultural Policy, 2013

The overall objective of the National Agriculture Policy is to make the nation self-sufficient in food through increasing production of all crops including cereals. Chapter 13 emphasizes on natural resource management, conservation natural resources, especially crop genetic resource collection, conservation, and maximization of their uses.

The National Environment Policy, 2018

The National Environment Policy 2018, the key policy documents of the Government, addressed 15 sectors in all, in addition to providing directives on the legal framework and institutional arrangements. This policy had a clear mention of biodiversity and its conservation as a cross-cutting issue. The policy has been updated and the Policy, 2018 has been approved by the National Environment Committee has been waiting for gazette notification. The revised policy has an explicit mention of biodiversity.

Draft National Forestry Policy, 2018

The previous National Forest Policy aims to conserve the existing forest areas and bring about 20% of the country's land area under the afforestation program and increase the protected areas by 10% of the reserve forest land by the year 2015. The Draft National Forest Policy 2018 echoes similar visions as stated as to increase and stabilize forest cover to at least 20% of the country's geographical area. Other visions include addressing of emerging challenges of climate change, sustainable flow of ecosystem services, biodiversity conservation through sustainable management of forests, wildlife and other ecosystems including Protected Areas. The draft policy also ensures implementation of CBD, CITES, Ramsar Convention and related International Conventions, Treaties and Protocols (ICTPs).

2.6.2 Legislations

The East Bengal Conservation of Fish Act, 1950 (amended in 1963, 1970, 1982, 1995, and 2002)

This Act provides power to the government to: make and apply rules to protect fisheries; prohibit or regulate erection and use of fixed engines; and construction of temporary or permanent weirs, dams, bunds, embankments, and other structures. The Act prohibits the destruction of fish by explosives, guns, and bows in inland or coastal areas; destruction of fish by poisoning, pollution, or effluents. The Act prescribes the seasons during which fishing is allowed, prohibits fishing during spawning periods, and specifies officials having authority to detect breaches of this Act. The Act bans fish catches of specific sizes and durations of various species aiming at more production and conserving brood fishes.

The Bangladesh Environment Conservation Act, 1995 (Last Amendments 2010)

The Environmental Conservation Act (ECA) of 1995 is the main legislative framework relating to environmental protection in Bangladesh. This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. This Act has established the Department of Environment (DoE) and empowers its Director-General to take measures as he considers necessary which includes conducting inquiries, preventing probable accidents, advising the Government, coordinating with other authorities or agencies, and collecting and publishing information about

environmental pollution. According to this act (Section 12), no industrial unit or project shall be established or undertaken without obtaining, in a manner prescribed by the accompanying Rules, an Environmental Clearance Certificate (ECC) from the Director General of DoE.

The amendments in 2010, provided clarification of defining wetlands as well as Ecologically Critical Areas and included many important environmental concerns such as conservation of wetlands, hill cutting, ship breaking, and hazardous waste disposal. This amendment empowered the government to enforce more penalties than before. Moreover, affected persons were given provision for putting objections or taking legal actions against the polluters or any entity creating a nuisance to the affected person.

The Wildlife (Conservation and Security) Act, 2012

An Act to provide for the conservation and safety of biodiversity, forest, and wildlife of the country by repealing the existing law relating to conservation and management of wildlife of Bangladesh. It empowers the Government to create sanctuaries, eco-park, safari park, botanical garden, or breeding ground on any state-owned forest land, land or water-body. It regulates the protection of wild animals and plants of the country. The act regulates the import, export, and re-export of wild animals and plants in the auspices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Act has given the Co-management Committees for management of Protected Areas as a legal status. The Act mandates the defining offenses in terms of wildlife conservation and protection and imposing penalties.

The Bangladesh Biosafety Rules, 2012

The Government formulated the Bangladesh Biosafety Rules, 2012 under the authority bestowed to it by Section 20 of the Bangladesh Environment Conservation Act, 1995. The Rules provides regulations on the approval process for biotech products developed domestically or by a third country. Per the Rule, all genetically modified products need to be approved before they can be imported or sold domestically within Bangladesh. The Rule notes that the MoEF needs to follow the Biosafety Guidelines of Bangladesh, 2007 in approving any biotech product.

The Ecologically Critical Areas Management Rules, 2016

The Government formulated the Ecologically Critical Areas Management Rules, 2016 under the authority bestowed to it by Section 20, Section 5 of the Bangladesh Environment Conservation Act, 1995. The Rules provide the management, conservation and protection and processes of the Ecologically Critical areas (ECAs) of the country. It also provides the maintenance of land cases of the ECAs, principles of adoption development projects in the ECAs, prohibition of activities in the ECA that includes protection of species and habitat diversities inside the ECA. Thus, it is linked with the protection and restoration of the biodiversity of the country.

The Protected Area Management Rules, 2017

Bangladesh has enacted The Protected Area Management Rules 2017 under the provision of the Wildlife (Conservation and Security) Act 2012. Co-management principles have been defined and implementation guidelines have been outlined in the Protected Area Management Rules, 2017. The Co-Management Committee (CMC) has been instituted by the legal basis of the Protected Area Management Rules, 2017. The Rules provide structure, formation, the scope of work, responsibilities, and duties of the Co-management Committee (CMC). Directives are there in the Rules to engage women, ethnic communities, and the forest resources dependent people in managing Protected Area.

The Bangladesh Biological Diversity Act, 2017

The Government of the People's Republic of Bangladesh has enacted the 'Bangladesh Biological Diversity Act, 2017' to meet the obligations of her Constitution and the obligations of the CBD. The Act reflects the aims of the CBD to promote the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources. The Act regulates the biodiversity assessment and conservation through management committees from the village to the national level, preparation and periodical amendments of the biodiversity conservation strategy and planning and sharing of benefits arising from its components. As of September 2017, its Rules are yet to be framed.

2.6.3 Strategy and Action Plan

National Sustainable Development Strategy (NSDS) in the Context of the CBD

The National Sustainable Development Strategy (NSDS) has been prepared to meet the formidable environmental challenges that Bangladesh faces in the way to development. The challenges arise when the country's development efforts and made without proper recognition of consequential environmental impacts which lead to degraded agro-ecosystem, rivers and wetlands, coastal environment and urban environment, degradation and depletion of groundwater, deforestation, and desertification in different parts of the country.

The NSDS (2010-21) has identified five Strategic Priority Areas along with three cross-cutting areas with a view to achieving its stated vision and addressing long-term sustainability issue of productive resources. The strategic priority areas include sustained economic growth, development of priority sectors, social security and protection, urban environment, and environment, natural resources and disaster management. The three cross-cutting issues that will support the sustainable development of priority areas include disaster risk reduction and climate, good governance, and gender. The strategies of NSDS have been reflected in the 7th Plan Five Year Plan and thus act as a vehicle for implementing the strategies. It has addressed mainstreaming sustainable development challenges across sectors and integrates economic, social and environmental objectives across sectors.

National Biodiversity Strategies and Action Plan (NBSAP)

Article-6 of the CBD requires that "Each Contracting Party" shall, in accordance with its conditions and capabilities:

a. "Develop national strategies, plans or programs for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programs which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned", and

b. "Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programs and policies".

The NBSAP is a national document that responds to the obligations of the CBD. It includes strategies and action plans for the conservation, sustainable use and equitable sharing of benefits biodiversity. The Conference of Parties to the CBD, in 2010 in Nagoya, Japan, adopted the Strategic Plan for Biodiversity 2011 – 2020 with the purpose of inspiring broad-based action in support of biodiversity over next decade by all countries and stakeholders.

The NBSAP is a process by which countries can plan to address the threats to their biodiversity. As such they are the principal instruments for the implementation of the Convention both at the national and at the global level, and they are increasingly relevant to other biodiversity-related conventions and agreements which contribute to the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Targets.

Bangladesh developed its first NBSAP in 2004 taking into consideration the issues of implementing 2010 Biodiversity Targets (MoEF, 2005). Towards contributing to the global targets (Aichi Biodiversity Targets) and implementation, Bangladesh has developed the second generation of NBSAP in 2015. In this second NBSAP, 20 national targets have been proposed to be taken into action during the fiscal year 2015-2016 to 2020-2021 (MoEF, 2016). The 20 national targets are as follows:

Target-1: by 2021	Relevant stakeholders will be aware on the value of biodiversity and play an active role in ensuring sustainable use
Target-2: by 2021	Assessment of valuation of goods and services of major ecosystems will be furnished towards integration into national accounting system
Target-3: by 2021	Studies on the impacts of incentives or subsidies on biodiversity, as well as development of policy roadmaps for phasing out of incentives or subsidies harmful to biodiversity will be completed towards mainstreaming the relevant ministry for implementation of the policy roadmap
Target-4: by 2021	Policy on Sustainable and Consumption Production (SCP) to maintain safe ecological limit of natural resources of major ecosystems will be furnished and disseminate the policy to all the stakeholders will be done towards implementation
Target-5: by 2021	Studies on the rate of habitat loss will be furnished towards promoting implementation of land use policy and enforcement of relevant legislations on conservation of natural habitats
Target-6: by 2021	Stock assessment of fish, invertebrate stocks and aquatic plants will be undertaken keeping in mind the safe ecological limit and awareness raising of the stakeholders will been enhanced so that aquatic biodiversity will be managed and harvested sustainably, legally taking into account of ecosystem-based approach towards avoidance of overfishing and conservation of threatened species and vulnerable ecosystems
Target-7: by 2021	Development of Integrated Management Plan will be completed for areas under agriculture, aquaculture and forestry towards ensuring conservation and sustainable use of biodiversity
Target-8: by 2021	Study on impact of pollution and excess nutrient on functioning of major ecosystems will be conducted and enforcement drive for controlling pollution will be strengthened.
Target-9: by 2021	Study on the impact of IAS will be furnished, regulations towards control of IAS will be developed and capacities at the port-of-entries will be enhanced to regulate IAS
Target-10: by 2021	Multiple pressure on coral associated island (St. Martin) and Sundarban mangrove ecosystem will be reduced through implementation of management plan of the ecosystems.
Target-11: by 2021	Bangladesh's 3% area under terrestrial ecosystem (forests), 3% area under inland wetlands and coastal ecosystems and 5% of total marine area will come under PAs or ECAs with development and implementation of management plan for these areas
Target-12: by 2021	The extinction of known threatened species will be prevented and their conservation status, particularly of those most in decline, has been improved and sustained
Target-13: by 2021	Capacity of in-situ and ex-situ conservation facilities will be strengthened to conserve the genetic diversity of cultivated plants, indigenous livestock and poultry resources
Target-14: by 2021	Develop and implement restoration plan for degraded wetlands and rivers taking into account the needs of vulnerable people and local communities
Target-15: by 2021	initiate implementation of restoration plan for degraded ecosystems, especially, forestlands and wetlands for addressing climate change mitigation, adaptation and combating desertification

Target-16: by 2016	Bangladesh Biological Diversity Act addressing the issues of ABS will be finalized and the instrument of ratification for the Nagoya Protocol on ABS will be submitted to the secretariat of CBD
Target-17: by 2016	Bangladesh will develop, adopt and update NBSAP and commence implementation of the document in an effective and participatory manner
Target-18: by 2021	Traditional knowledge, innovations and practices of local communities or ethnic groups will be recognized and documented
Target-19: by 2021	Agencies responsible for Biodiversity and Natural Resources Management will be adopting modem information technology like GIS and RS and information on biodiversity will be shared through Clearing House Mechanism (CHM)
Target-20: by 2017	Financial resources will be mobilized towards accelerated implementation of targets and activities of updated NBSA

The Second generation or revised NBSAPs have tended to be more in line with this broader definition; they resemble more a planning process, than a fixed document. Such a planning process is equally relevant to the other biodiversity-related conventions and agreements.

The Convention requires countries not just to prepare a national biodiversity strategy, but to ensure that this strategy contains elements that are incorporated into the planning and activities of all those sectors whose activities can have an impact (positive and negative) on biodiversity. This is what is meant by 'mainstreaming' – all relevant sectors of government, the private sector and civil society working together to implement the strategy.

The NBSAP should be a living process by which increasing scientific information and knowledge, gained through the monitoring and evaluation of each phase of implementation, and is fed back into a permanent review process. This should result in periodic updating and revision of the NBSAP. The NBSAP is a 'living' document which is flexible and practical.

Topic 2.7
Linkage Between CBD, NSDS, NBSAP and SDG

2.7.1 The Strategic Plan for Biodiversity 2011 – 2020 And the Aichi Targets: "Living in Harmony with Nature"

The tenth Conference of the Parties (COP 10) of the UNCBD held from 18 to 29 October 2010 in Nagoya, Aichi Prefecture, Japan, adopted a revised and updated Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets, for the 2011-2020 period (Decision COP10/2). This Plan provides an overarching framework on biodiversity, not only for the biodiversity-related conventions but for the entire United Nations system and all other partners engaged in biodiversity management and policy development. Parties to the Convention on Biological Diversity (CBD) adopted the Strategic Plan for Biodiversity 2011–2020, a ten-year framework for action by all countries and stakeholders to safeguard biodiversity and the benefits it provides to people. As part of the Strategic Plan 20 ambitious but realistic targets, known as the Aichi Biodiversity Targets, were adopted. The Strategic Plan for Biodiversity is comprised of:

The vision of the Aichi Biodiversity Targets: By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.

The mission of the Aichi Biodiversity Targets: Take effective and urgent action to halt the loss of biodiversity to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication. To ensure this, pressures on biodiversity are reduced, ecosystems are restored, biological resources are sustainably used and benefits arising out of utilization of genetic resources are shared in a fair and equitable manner; adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented, and decision-making is based on sound science and the precautionary approach.

The Aichi Biodiversity Targets have 20 targets included in five Strategic Goals (A – E).

Strategic Goal A	Strategic Goal B	Strategic Goal C	Strategic Goal D	Strategic Goal E
Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	Reduce the direct pressures on biodiversity and promote sustainable use	To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity	Enhance the benefits to all from biodiversity and ecosystem services	Enhance implementation through participatory planning, knowledge management and capacity building

STRATEGIC GOAL A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	
	**Target 1** By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
	**Target 2** By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.
	**Target 3** By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.
	**Target 4** By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.
*STRATEGIC GOAL B: Reduce the direct pressures on biodiversity and promote sustainable us*e	
	**Target 5** By 2020, the rate of loss of all-natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
	**Target 6** By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.
	**Target 7** By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
	**Target 8** By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

	**Target 9** By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.
	**Target 10** By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.
STRATEGIC GOAL C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity	
	**Target 11** By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.
	**Target 12** By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
	**Target 13** By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.
STRATEGIC GOAL D: Enhance the benefits to all from biodiversity and ecosystem services	
	**Target 14** By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.
	**Target 15** By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.
	**Target 16** By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

STRATEGIC GOAL E: Enhance implementation through participatory planning, knowledge management and capacity building	
	**Target 17** By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.
	**Target 18** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.
	**Target 19** By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.
	**Target 20** By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

Governments have committed to establishing national targets in support of the Aichi Biodiversity Targets. Bangladesh has already developed its updated National Biodiversity Strategy and Action Plans 2011 – 2020 in the light of Aichi Targets.

2.7.2 Linkage between CBD and NSDS

One of the primary objectives of Environment, Natural Resource and Disaster Management Strategic Priority Area of the NSDS is to ensure environmental protection for humans, ecosystems and resources with due emphasis on conservation, augmentation and efficient utilization of the natural resources. It covers water resources, forestry and bio-diversity, land and soil, coastal and marine resources, and natural disasters and climate change. Forest and Biodiversity, and Coastal and Marine Resources are two major elements of this Strategy.

The Strategic Priority Area, Environment, Natural Resource and Disaster Management of the NSDS is linked with Articles 8, 9, 10, 11and 14 of the CBD. In addition, Forest and Biodiversity, and Coastal and Marine Resources, two major components of the Priority Areas are also linked with similar Thematic Programmes of Works of the CBD. The Cross-cutting Issues of the NSDS correspond to the cross-cutting issues of the CBD.

19 https://www.cbd.int/sp/targets/

2.7.3 Linkage between NSDS and NBSAP

Strategies outlined in the NSDS to achieve the success can be linked with the NBSAP targets. Towards contributing to the global targets (Aichi Biodiversity Targets) and implementation of NBSAP, 20 national targets have been proposed to be taken into action during the fiscal year 20 15-2016 to 2020-2021. Out of these proposed 20 targets following targets (target 10 to target 15) of the NBSAP are linked with the strategies of the on Environment, Natural Resource and Disaster Management (MoEF, 2016).

Target-10: by 2021	Multiple pressure on coral associated island (St. Martin) and Sundarban mangrove ecosystem will be reduced through implementation of management plan of the ecosystems.
Target-11: by 2021	Bangladesh's 3% area under terrestrial ecosystem (forests), 3% area under inland wetlands and coastal ecosystems and 5% of total marine area will come under PAs or ECAs with development and implementation of management plan for these areas
Target-12: by 2021	The extinction of known threatened species will be prevented and their conservation status, particularly of those most in decline, has been improved and sustained
Target-13: by 2021	Capacity of in-situ and ex-situ conservation facilities will be strengthened to conserve the genetic diversity of cultivated plants, indigenous livestock and poultry resources
Target-14: by 2021	Develop and implement restoration plan for degraded wetlands and rivers considering the needs of vulnerable people and local communities
Target-15: by 2021	Initiate implementation of restoration plan for degraded ecosystems, especially, forestlands and wetlands for addressing climate change mitigation, adaptation and combating desertification

2.7.4 Implementation of NBSAP towards Achieving Sustainable Development Goals (SDGs)

The 17 Sustainable Development Goals (SDGs) for the period of 2016-2030 adopted by all member states of the United Nations in September 2015 set ambitious objectives across the three dimensions of sustainable development- economic development, social inclusion, and environmental sustainability, underpinned by good governance. The importance of biodiversity for the 2030 Agenda is directly recognized in SDG 14 (conserve and sustainably use the oceans, seas and marine resources for sustainable development) and SDG 15 (protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss). A similar interdependence exists between biodiversity and SDG 13 (take urgent action to combat climate change and its impacts). Implementation of National Biodiversity targets under the NBSAP can provide useful insight and support towards achieving more than half of all SDGs. The biodiversity-focused SDGs can make direct use of the data submitted under the CBD, making the case for aligned reporting frameworks to capitalize on CBD experience and avoid duplication of work. Other SDGs can benefit from significant synergies and co-benefits (MoEF, 2016). Understanding the relationships of NBSAP targets and biodiversity-related SDGs could be useful for mainstreaming biodiversity across the sectors and the relevant stakeholders. Implementing the NBSAP targets will make tremendous impacts to achieve the corresponding SDG targets.

Topic 2.8
National Progress in Implementing CBD Obligations

2.8.1 Mainstreaming CBD into National Planning and Budgeting Process

Mainstreaming of biodiversity is very important towards ensuring integration of biodiversity conservation and sustainable use of biodiversity in both sector and cross-sector plans such as sustainable development, climate change adaptation and mitigation, trade and international cooperation, and in sector-specific plans such as agriculture, fisheries, forestry, mining, energy, tourism, transport and others will be facilitating a lot in terms of achieving the NBSAP targets.

The CBD has emphasized the need for mainstreaming biodiversity into national and local development and poverty reduction strategies, most recently in its new Strategic Plan for Biodiversity (2011-2020).

Various national policies, and strategies have already included biodiversity and natural resources management issues. Conservation of environment and biodiversity has been inserted in the National Constitution as the basic principle of state governance.

Biodiversity in the Constitution of Bangladesh

Biodiversity and Environment were not explicit in the Bangladesh Constitution, originally adopted in 1972. Government of Bangladesh in the year 2011 took the initiative to amend the constitution inserting the text in Article 18A (Protect and improve the environment and to preserve and safeguard the natural resources, biodiversity, wetlands, forests and wildlife for the present and future citizens) of the Constitution of the People's Republic of Bangladesh that describes environment and biodiversity conservation and development as one of the principle of state government. The article states: *"The state shall endeavor to protect and improve the environment and preserve and safeguard the natural resources, biodiversity, wetlands, forests, and wildlife for the present and future citizens"*. As per constitutional obligation, biodiversity conservation is the responsibility of every citizen of the country to uphold the constitution. All the government machinery should keep in mind the issue of conservation of the environment and biodiversity in taking up any development undertakings.

Biodiversity in the Seventh Five Year Plan

In the Seventh Five Year Plan (FY2016-FY2020), Sector 8 has been dedicated to Environment and Climate Change. Issues 14, 15 and 16 under Sector 8 are on Biodiversity. Issue 14 with the heading Biodiversity conservation and sustainable use issues have vehemently come up with more focus on the implementation of updated NBSAP in the Seventh Five Year Plan (FY2016-FY2020). It has been mentioned in the seventh plan as an issue under forestry and biodiversity (issue no. 14, p492) with the heading Mainstreaming the NBSAP. The Seventh Five Year Plan stated the biodiversity tasks to be implemented as follows:

- Bangladesh Biological Diversity Act will be enacted, as well as necessary rules will be framed
- Valuation of goods and services provided by ecosystem and biodiversity will be accomplished towards the integration of the values into the national accounting system
- Awareness and education on biodiversity will be enhanced by taking up development initiatives
- Polluting the ecosystems from all sources will, wherever possible, be stopped or minimized
- Indigenous and Traditional Knowledge on Biodiversity will be documented

Ecosystem Valuation in the National Accounting Systems

The valuation of ecosystems is of important priority under the updated NBSAP and Seventh FYP (2016-2020). Economic valuation of ecosystem goods and services is very important for enhanced understanding about the importance of biodiversity among the policymakers, development planners, as well as the common people which will in turn help to ensure conservation and sustainable use of biodiversity. Environmental, Climate Change and disaster risk reduction considerations are integrated into project design, budgetary allocations and implementation process. Economic valuation of the goods and services of the ecosystems should be reflected in the annual budget and allocation to the ADP. Bangladesh Bureau of Statistics should enhance its capacity to assess the green GDP (MoEF, 2016).

2.8.2 National Reports

Article 26 of the UNCBD requires the Parties to present reports to the COP on measures taken to implement the Convention and the effectiveness of those measures in meeting the Convention's objectives. It provides a mechanism to monitor the implementation of the Convention. Each Contracting Party is obliged to report regularly on the measures taken to implement the Convention. The reports would normally be presented through the Secretariat to the Conference of the Parties for its consideration. An obligation to report at regular intervals such as this implies the report will be discussed by the Conference. The Convention does not specify the intervals at which the reports should be delivered. This decision will be made by the Conference of the Parties; many other Conventions require such a report to be provided at each ordinary meeting of the COP. Conference of the Parties to decide the format in which to present the reports. Bangladesh has submitted five national reports in six reporting cycle starting from 2001. The first National report in 1998, was not submitted by Bangladesh.

CBD Second National Report Bangladesh 2001

According to the decision V/19 of COP5 5, the Parties were to submit their second national reports by 15 May 2001. Bangladesh also submitted the report as per the established programmes of work that respond to a number of Articles of the Convention.[20]

CBD Third National Report Bangladesh 2005

Bangladesh submitted its third national report on 15 May 2005. Ministry of Environment and Forest (MoEF) took the lead in preparing this report as the focal ministry for CBD. Technical support was provided by the IUCN Bangladesh Country Office and UNDP-GEF provided the financial support.[21]

Fourth National Report to the Convention on Biological Diversity 2010

Bangladesh submitted its fourth national report (Biodiversity National Assessment and Programme of Action 2020) in January 2010. The report assessed the status of biodiversity of Bangladesh indicating a shrinking trend that called for the immediate actions.[22]

20 https://www.cbd.int/doc/world/bd/bd-nr-02-en.doc
21 https://www.cbd.int/doc/world/bd/bd-nr-03-en.doc
22 https://www.cbd.int/doc/world/bd/bd-nr-04-p1-en.pdf

Fifth National Report of Bangladesh to the Convention on Biological Diversity 2015

In decision COP10/10, the Conference of the Parties requested Parties to submit their fifth national report by 31 March 2014. Bangladesh prepared and submitted the Fifth National Report (Biodiversity National Assessment) in November 2015. The national assessment was articulated in three broad chapters as follows:

- An Update on Biodiversity Status, Trends and Threats in Bangladesh and Implications for Human Well-being
- National Biodiversity Strategy and Action Plan: Progress of Implementation and Mainstreaming
- Bangladesh's progress towards Aichi Biodiversity Targets and Millennium Development Goals.[23]

Sixth National Report of Bangladesh to the Convention on Biological Diversity 2018

In decision XIII/27, COP 13 adopted guidelines, including reporting templates, for the sixth national report due 31 December 2018. Bangladesh has submitted the sixth national report on 30 December 2018. The report provided information on the targets being pursued at the national level, implementation measures taken and assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets. The report assessed progress towards each national target and described the national contribution to the achievement of each Aichi Biodiversity Target. The report also included additional information on contribution of indigenous people and local communities. Finally, the report provided an updated biodiversity country profile that includes biodiversity facts, measures to enhance implementation of the convention, overall actions taken to contribute to the implementation of the strategic plan for biodiversity 2011-2020 and mechanisms for monitoring and reviewing implementation.[24]

23 https://www.cbd.int/doc/world/bd/bd-nr-05-en.pdf
24 https://www.cbd.int/nr6.

Topic 2.9
Conservation of Biological Diversity: Good Practices in Bangladesh

The material of this session is provided as a separate document titled
“Good Practices and Innovations in Implementing Rio Conventions In Bangladesh”.

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Notes on Module-2 of the Training Manual

MODULE-3

United Nations Framework Convention on Climate Change (**UNFCCC**)

Overview of the MODULE-3

 **Objectives**	This module on 'United Nations Framework Convention on Climate Change (UNFCCC)' intends to • Provide a fundamental understanding on the convention of climate change • Create a profound understanding on the international FCCC regime • Grow a pragmatic perception on the policy responses of FCCC • Gain knowledge on the FCCC related other agreement and protocols and synergies among these agreements • Inform the evidence-based good practices in Bangladesh relevant to FCCC • Provide guidance on key aspects for the preparedness of Bangladesh as a party of the UNFCCC
 **Participants**	The short training program targets the government officials from the concerned ministries, line agencies, departments, trainers and officials of the public training institutions as participants.
 **Training Methodology**	The module intends to enhance knowledge and skills of the government officials and national trainers, which is required for developing and implementing the MEAs at the national level. The module will encourage participants to think creatively, absorb quickly by utilizing the contemporary adult learning methodologies, including • Presentations and discussions • Interactive lectures • Sharing the experiences • Feedback from the participants
 **Resource Persons**	Training will be conducted by the renowned resource person(s) having related expertise on the subject matters.

Expected Learning Outcomes	By the end, the participants will be enhanced with knowledge, skills and aptitudes on: • Development and operations of UNFCCC • Obligations and policy responses related to the Conventions • The implementation framework of FCCC • Progress of Bangladesh for implementing the UNFCCC • Best practices related to FCCC in Bangladesh
	3.1 Climate change • Climate System • Climate Change Impacts and Vulnerabilities: Global and Regional Contexts 3.2 UN Framework Convention on Climate Change • Kyoto Protocol to the Convention • The Paris Agreement • Major COP Decisions • Major thematic Areas (Adaptation, Mitigation, Loss & Damage, Finance, Technology, Capacity Building) 3.3 Climate Change Impacts in Bangladesh: Key Sectors and Vulnerabilities • Crop Agriculture, Livestock, Fisheries, Food Security, Water Resources, Human Health, Infrastructure, Coastal Zone • 3.4 National Responses to Climate Change • Adaptation Efforts • Mitigation Efforts • Climate Funds of the Government of Bangladesh • Technology, Capacity Building 3.5 Implementation of UNFCCC, National Reports 3.6 Dealing Climate Change: Good Practice in Bangladesh
Helpful Tips for Participants	To derive maximum benefits from the training course, please note the following: • Identify areas that you are interested in and see how the deliberations address the issues. • If you want information about certain issues, feel free to share with the resource persons. • Use this forum to share your experiences and opinions with other participants.
Logistics	• Supplies and equipment (whiteboard, multimedia, sound system, computer, wi-fi etc.) • Stationeries (markers, paper etc.) • Handouts (Training Module
Duration	4.5 hours

TOPIC 3.1:
Climate Change

To understand the idea of climate change it is important to have the firsthand knowledge about some basics, such as, what weather and climate are, and how they are related; what is the climate system, its components; climate variability; greenhouse effect and greenhouse gases.

Climate is generally defined as average weather, and as such, climate change and weather are intertwined. Observations can show that there have been changes in weather, and it is the statistics of changes in weather over time that identify climate change (IPCC, 2007).

Weather		Climate
"What is happening in the atmosphere at any given time"	**Vs**	**"Average weather over longer time frames"**

What is weather?

Weather is basically the way the atmosphere is behaving, mainly with respect to its effects upon life and human activities. The difference between weather and climate is that weather consists of the short-term (minutes to months) changes in the atmosphere. Most people think of weather in terms of temperature, humidity, precipitation, cloudiness, brightness, visibility, wind, and atmospheric pressure, as in high and low pressure (NASA, 2005).

What is climate?

The climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization. The relevant quantities are most often surface variables such as temperature, precipitation, and wind. The climate in a wider sense is the state, including a statistical description, of the climate system (IPCC, 2007).

Box 4: Difference between Climate and Weather

"An easy way to remember the difference is that climate is what you expect, like a very hot summer, and weather is what you get, like a hot day with pop-up thunderstorms." (NASA, 2005)

In most places, weather can change from minute-to-minute, hour-to-hour, day-to-day, and season-to-season. Climate, however, is the average of weather over time and space. An easy way to remember the difference is that climate is what you expect, like a very hot summer, and the weather is what you get, like a hot day with pop-up thunderstorms (NASA, 2005).

3.1.1 The Climate System

The climate system (figure 4) is a highly complex, interactive system having five major components:

The atmosphere: The air enveloping the globe is known as atmosphere and is 'the most unstable and rapidly changing part of the system'. The atmospheric air contains 78.01% of nitrogen (N_2), 20.9% oxygen (O_2) and 0.93% argon (Ar). Other gases of the atmosphere include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3) and water vapor (H_2O). CO_2, CH_4, N_2O, O_3, H_2O along with some others are the so-called greenhouse gases which will be discussed in the later sections.

The hydrosphere: This component consists of salt and fresh waters of the earth, from all kinds of water bodies including oceans, rivers, lakes, swamps etc. Nearly 71 percent of the earth surface is covered by water and the oceans hold about 96.5 percent of the earth's waters.

The cryosphere: Lithosphere comprises ice sheets from Greenland and Antarctica, continental glaciers and snowfields, sea ice and permafrost.[1]

The land surface: Also known as lithosphere is the earth's solid land. Plain land, mountains, soils and anything connected geologically to them are included in this component.

The biosphere: It extends to any place where there exists life. Human beings, vegetation, animals, fishes, birds- every living being on and in the earth, are part of the biosphere.

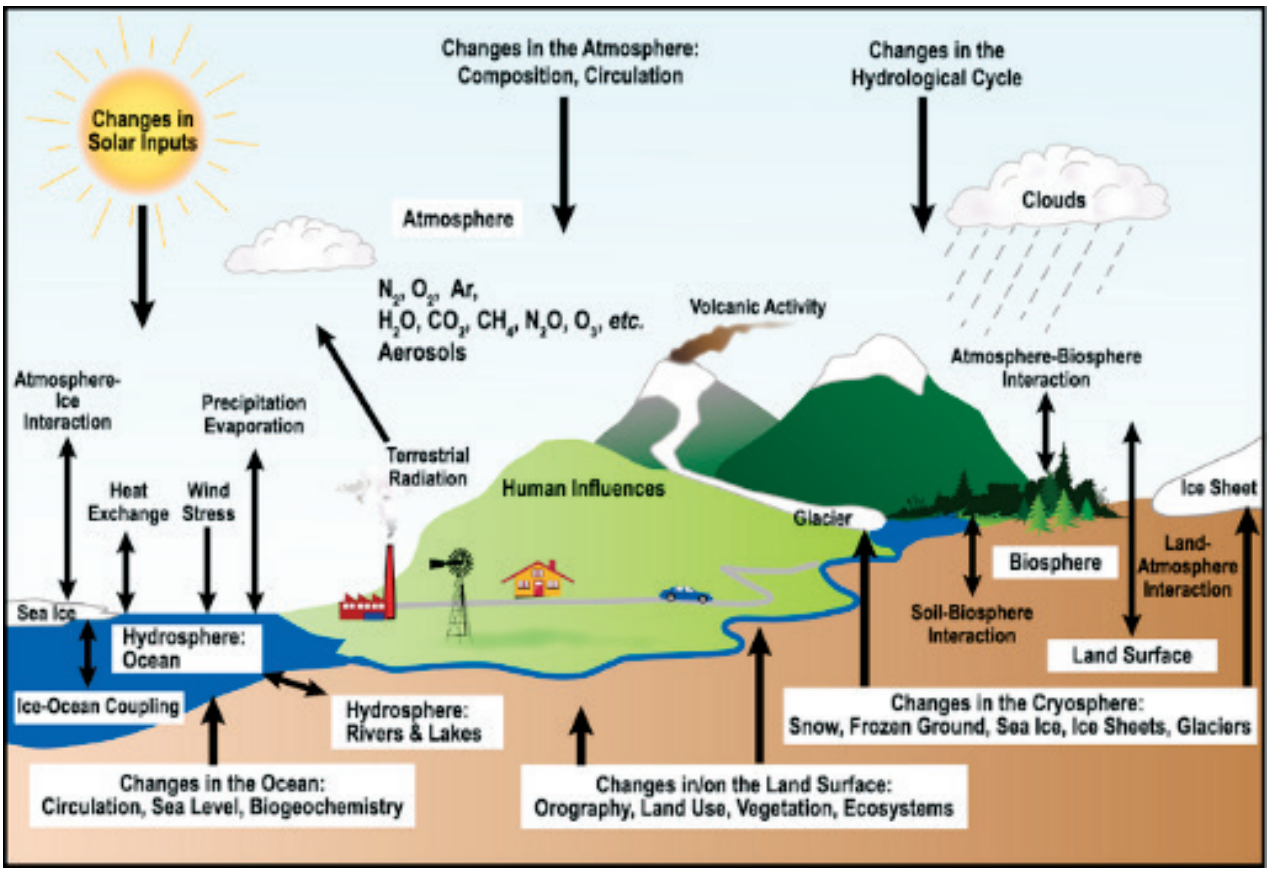


Figure 4: Schematic view of the components of the climate system, their processes and interactions (IPCC, 2007)

1 https://water.usgs.gov/edu/earthhowmuch.html

What is Climate Variability?

Climate Variability (Figure 5) is defined as variations in the mean state and other statistics of the climate on all temporal and spatial scales, beyond individual weather events. The term "Climate Variability" is often used to denote deviations of climatic statistics over a given period (e.g. a month, season or year) when compared to long-term statistics for the same calendar period. Climate variability is measured by these deviations, which are usually termed anomalies. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external factors (external variability).

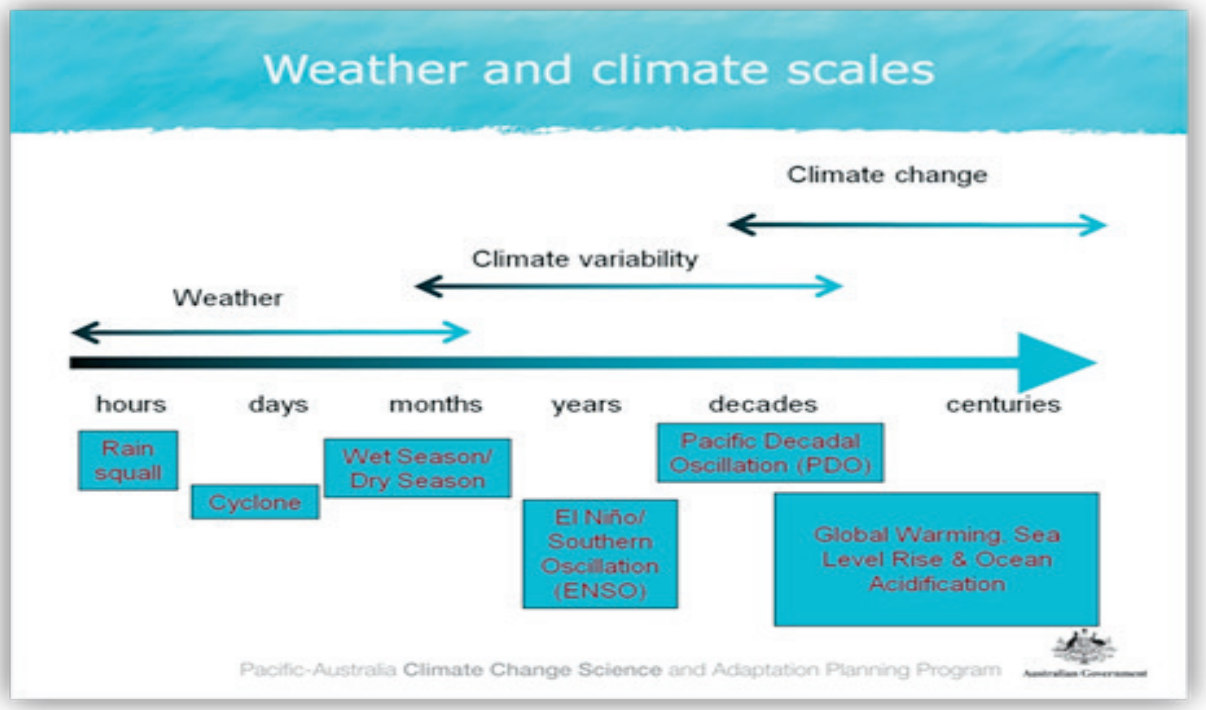


Figure 5: Weather, Climate Variability and Climate Change Time Scale (Department of the Environment and Energy, 2017)

What is Climate Change?

Climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external factors such as persistent changes to the atmosphere or changes in land use.

Article 1 of the United Nations Framework Convention on Climate Change (UNFCCC) defines "climate change" as:

> "A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods"

The UNFCCC thus makes a distinction between "climate change" attributable to human activities altering the atmospheric composition, and "climate variability" attributable to natural causes. [2]

2 https://public.wmo.int/en/about-us/FAQs/faqs-climate

What is Greenhouse Effect?

The greenhouse effect (Figure 6) is a natural process which keeps the earth surface warm. Energy coming from the sun enters the atmosphere, and part of it is absorbed by the earth's surface and part of it is reflected to the outer space by clouds, small atmospheric particles, ice, snow etc. Part of the energy absorbed by the earth is radiated back in the form of invisible heat energy (infrared radiation). And the greenhouse gases present in the atmosphere retain that heat resulting in a warmer atmosphere.

Box 5: Greenhouse Effect

"Some atmospheric gases absorb and re-emit infrared energy from the atmosphere down to the Earth's surface. This process, the greenhouse effect, leads to a mean surface temperature that is 33 °C greater than it would be in its absence. If it were not for the greenhouse gas effect, Earth's average temperature would be a chilly -18°C." (World Meteorological Organization, 2017)

Major components of the atmosphere, nitrogen (78.01%), oxygen (20.9%) and argon (0.93%) have limited interaction with the solar radiation and they don't interact with the infrared radiation. However, the greenhouse gases: carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) absorb and emit infrared radiation. Moreover, the atmosphere contains water vapor (H2O), which is also a natural greenhouse gas. Beside these gases, the atmosphere also contains solid and liquid particles (aerosols) and clouds, which interact with the incoming and outgoing radiation in a complex and spatially very variable manner. They're less than 0.1% of the total volume of gases in the atmosphere but play a very important role in the global temperature because of their heat absorption and emission property (IPCC, 2007).

One needs to distinguish between the natural greenhouse effect and the enhanced greenhouse effect. The natural greenhouse effect is caused by the natural amounts of greenhouse gases and is vital to life. In the absence of the natural greenhouse effect, the surface of the Earth would be approximately 33^{0}C cooler. The enhanced greenhouse effect refers to the additional radiative forcing resulting from increased concentrations of greenhouse gases induced by human activities. The main GHG whose concentrations are rising are carbon dioxide, methane, nitrous oxide, hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs) and ozone in the lower atmosphere.

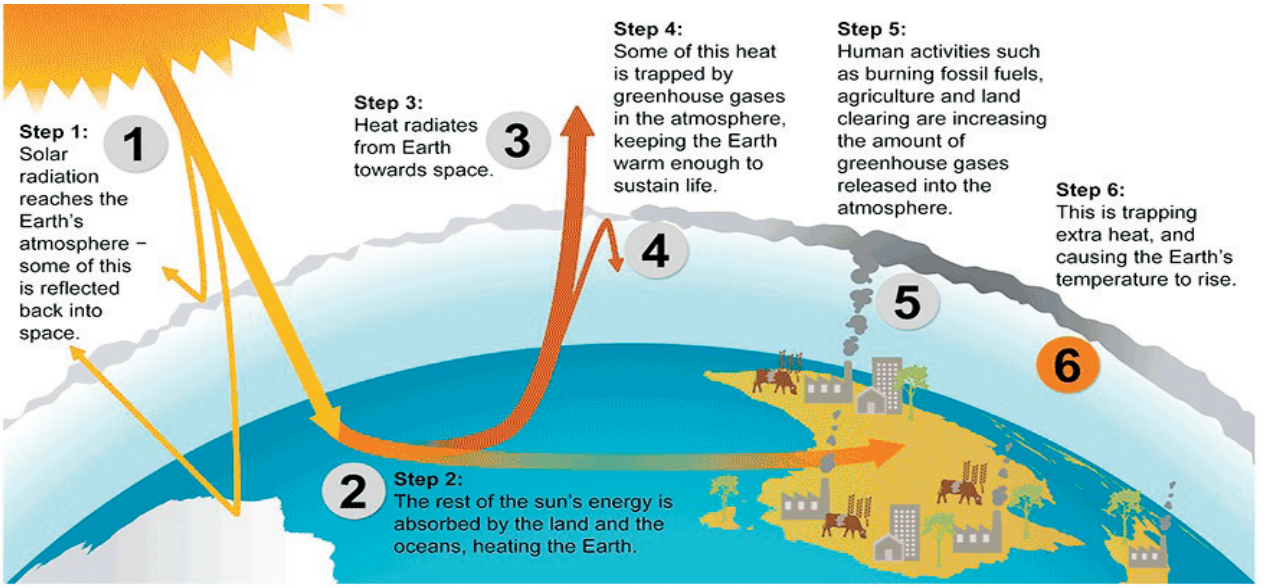


Figure 6: Illustration of Greenhouse effect. (Department of the Environment and Energy, Australian Government)

Causes of Climate Change

The concentrations of some GHGs, such as carbon dioxide (CO_2), are significantly influenced by humans, others, such as water vapor, are not.[3] At the global scale, the key greenhouse gases emitted by human activities are (figure 7):

- **Carbon dioxide (CO_2):** Fossil fuel use is the primary source of CO_2. CO_2 can also be emitted from direct human-induced impacts on forestry and other land use, such as through deforestation, land clearing for agriculture, and degradation of soils. Likewise, land can also remove CO_2 from the atmosphere through reforestation, improvement of soils, and other activities.
- **Methane (CH_4):** Agricultural activities, waste management, energy use, and biomass burning all contribute to CH_4 emissions.
- **Nitrous oxide (N_2O):** Agricultural activities, such as fertilizer use, are the primary source of N_2O emissions. Fossil fuel combustion also generates N_2O.
- **Fluorinated gases (F-gases):** according to EPA website, industrial processes, refrigeration, and the use of a variety of consumer products contribute to emissions of F-gases, which include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

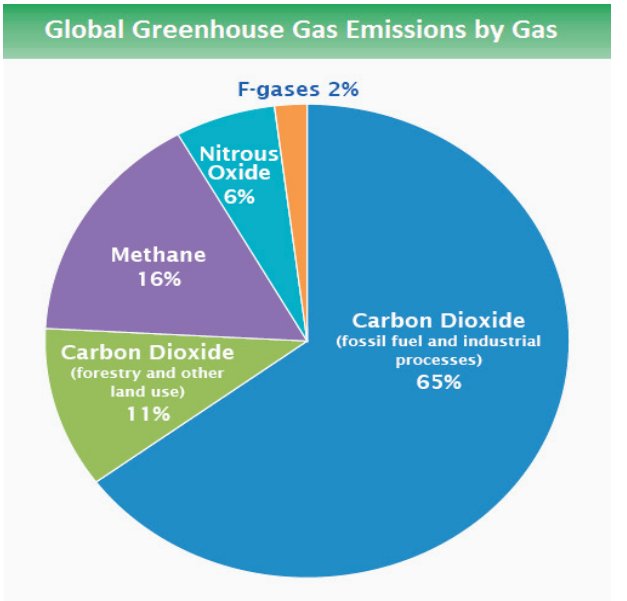


Figure 7: Global Greenhouse Gas Emission (IPCC, 2014. Based on global emissions from 2010)

Global greenhouse gas emissions (figure 8) can also be broken down by the economic activities that lead to their production.[4]

- **Electricity and Heat Production** (25% of 2010 global greenhouse gas emissions): The burning of coal, natural gas, and oil for electricity and heat is the largest single source of global greenhouse gas emissions.
- **Industry** (21% of 2010 global greenhouse gas emissions): Greenhouse gas emissions from industry primarily involve fossil fuels burned on site at facilities for energy. This sector also includes emissions from chemical, metallurgical, and mineral transformation processes not associated with energy consumption and emissions from waste management activities. (Note: Emissions from industrial electricity use are excluded, instead covered in Electricity and Heat Production sector.)

3 WMO website

4 IPCC (2014). Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

- **Agriculture, Forestry, and Other Land Use** (24% of 2010 global greenhouse gas emissions): Greenhouse gas emissions from this sector come mostly from agriculture (cultivation of crops and livestock) and deforestation. This estimate does not include the CO_2 that ecosystems remove from the atmosphere by sequestering carbon in biomass, dead organic matter, and soils, which offset approximately 20% of emissions from this sector.
- **Transportation** (14% of 2010 global GHG): Greenhouse gas emissions from this sector primarily involve fossil fuels burned for road, rail, air, and marine transportation. Almost all (95%) of the world's transportation energy comes from petroleum-based fuels, largely gasoline and diesel.

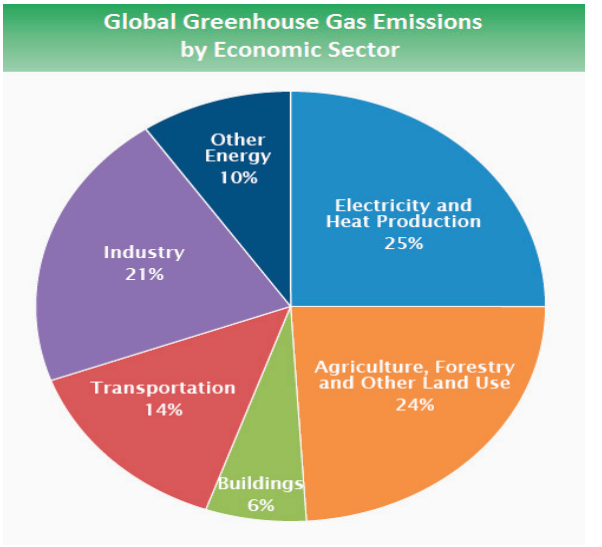


Figure 8: Global Greenhouse gas emissions by economic sectors. (IPCC, 2014. Based on global emissions from 2010)

- **Buildings** (6% of 2010 global greenhouse gas emissions): Greenhouse gas emissions from this sector arise from onsite energy generation and burning fuels for heat in buildings or cooking in homes.

Other Energy[5] (10% of 2010 global greenhouse gas emissions): This source of greenhouse gas emissions refers to all emissions from the Energy sector which are not directly associated with electricity or heat production, such as fuel extraction, refining, processing, and transportation.

Global carbon emissions from fossil fuels (figure 9) have significantly increased since 1900. Since 1970, CO_2 emissions have increased by about 90%, with emissions from fossil fuel combustion and industrial processes contributing about 78% of the total greenhouse gas emissions increase from 1970 to 2011. Agriculture, deforestation, and other land-use changes have been the second-largest contributors.[6]

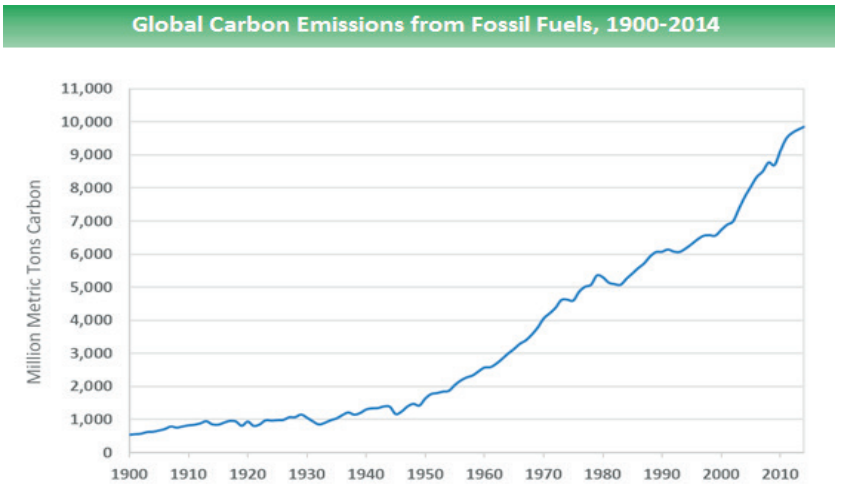


Figure 9: Trend in global carbon emissions from fossil fuels

5 EPA website https://www.epa.gov/

6 IPCC (2014). Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Ozone Depleting Substances (ODS)

The GHGs mentioned above are basically regulated under the FCCC and relevant instruments (Kyoto Protocol, Paris Agreement etc). However, there are other greenhouse gases namely CFC, HFC, Halon, Methyl Bromide, Methyl Chloroform, etc. which are also Ozone Depleting Substances (ODS) and controlled by Vienna Convention 1985 and Montreal Protocol for the Protection of the Ozone Layer 1987.

Short-Lived Climate Pollutants (SLCP)

Short-lived climate pollutants (SLCPs) (figure 10) are agents that have a relatively short lifetime in the atmosphere - a few days to a few decades - and a warming influence on climate. The main short-lived climate pollutants are black carbon, methane, and tropospheric ozone, which are the most important contributors to the human enhancement of the global greenhouse effect after CO_2. These short-lived climate pollutants are also dangerous air pollutants, with various detrimental impacts on human health, agriculture, and ecosystems. Other short-lived climate pollutants include some hydrofluorocarbons (HFCs). While HFCs are currently present in small quantity in the atmosphere their contribution to climate forcing is projected to climb to as much as 19% of global CO_2 emissions by 2050.

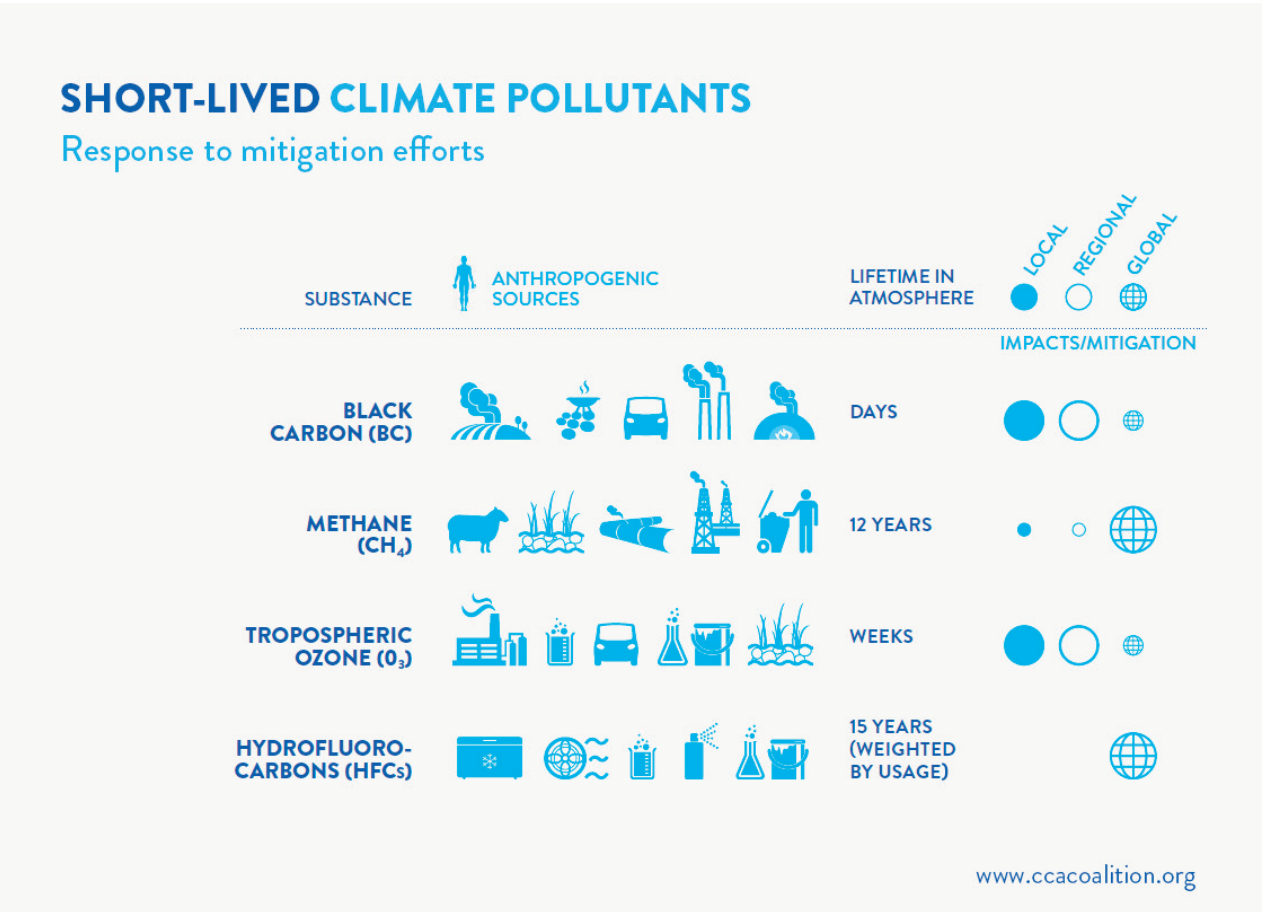


Figure 10: Short Lived Climate Pollutant

3.1.2 Climate Change Impacts and Vulnerabilities: Global and Regional Contexts

Impacts of climate (figure 11) has been evident through change in earth surface temperature, ocean warming, ocean acidification, variation in annual precipitation, arctic ice melting and sea level rise.

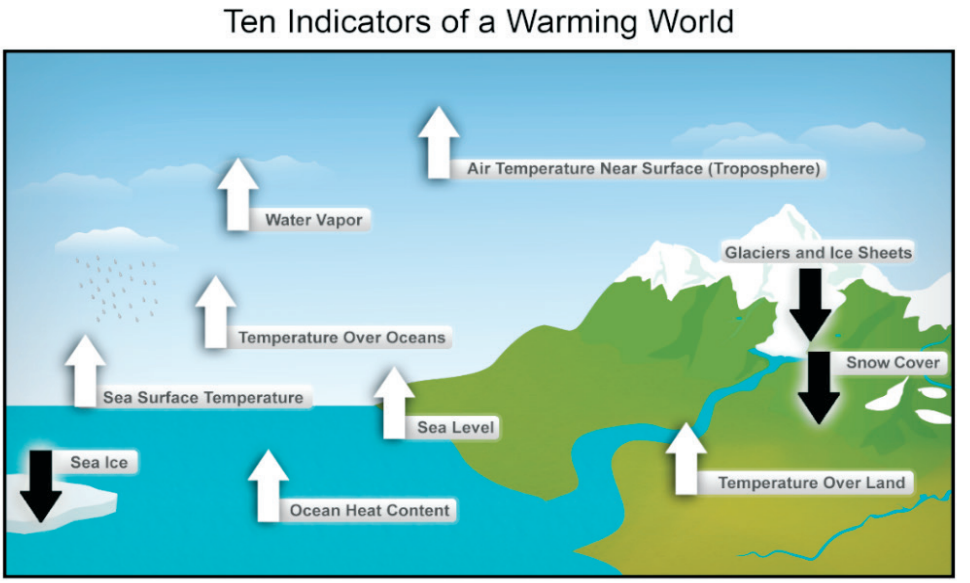


Figure 11: Ten Indicators of Global Warming (NOAA, 2017)

Global Surface Temperature Rise

The annual temperature average has always varied (Figure 12), with cold and warm periods alternating. However, each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850.

The temperature increase is widespread across the world, but there are important regional variations. Warming has been most marked in the northern Polar Regions (IPCC, 2014).

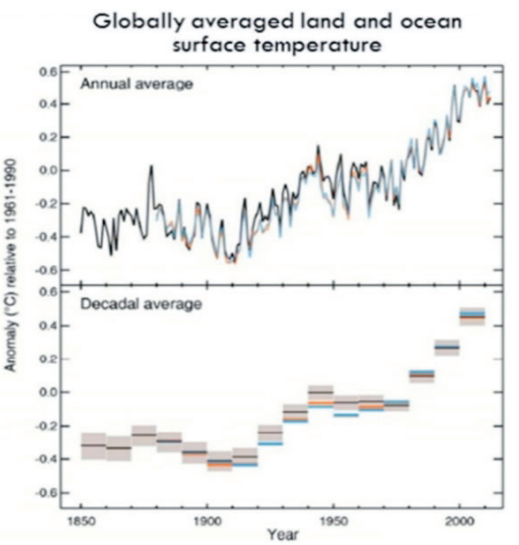


Figure 12: Observed Surface Temperature Anomaly: 1850-2012 (IPCC, 2014)

Variation in Annual Precipitation

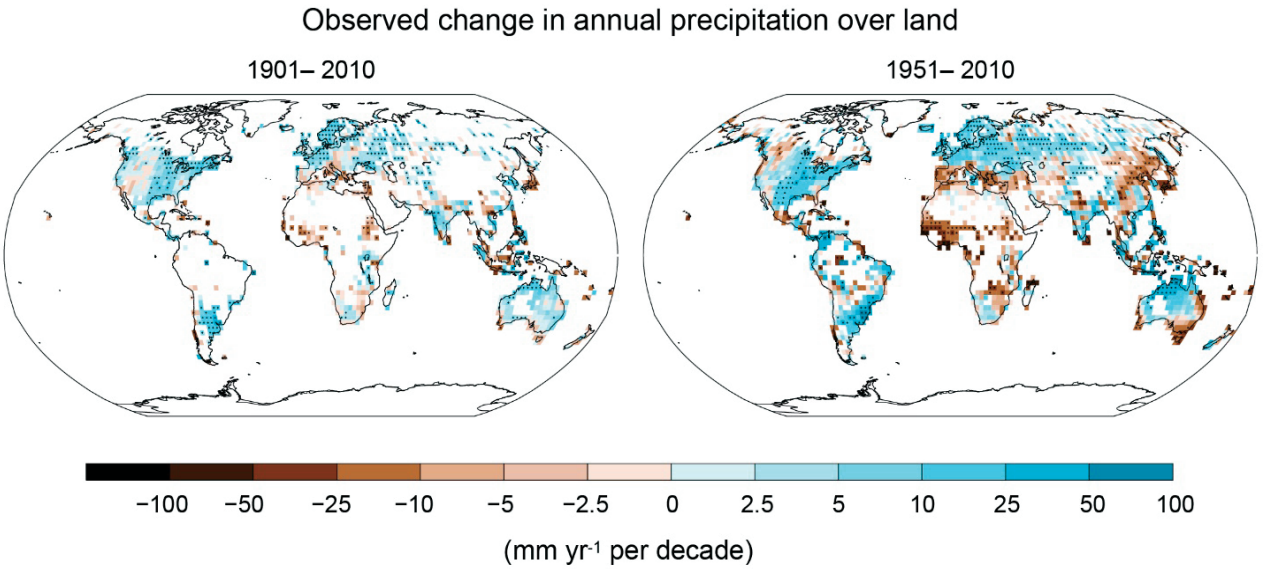


Figure 13: Observed Change in Annual Precipitation (IPCC, 2014).

Observations show that changes are occurring in the amount, intensity, frequency and type of precipitation. These aspects of precipitation generally exhibit large natural variability, and El Nino and other natural climate fluctuations have a substantial influence. Over the past century, pronounced long-term trends in precipitation amounts have been observed: significantly wetter in eastern North and South America, northern Europe, and northern and central Asia, but drier in the Sahel, southern Africa, the Mediterranean and southern Asia. Moreover, widespread increases in heavy precipitation events have been observed, even in places where total amounts have decreased. The two maps show the observed precipitation change from 1901 to 2010 and 1951 to 2010 (IPCC, 2014).

Ocean Warming: Ocean warming (figure 14) dominates the increase in energy stored in the climate system. Oceans account for more than 90% of the energy accumulated between 1971 and 2010. 60% of the net energy increase is stored in the upper ocean (0-700 m) and about 30% is stored in the ocean below 700 m. The ocean warming is largest near the surface, am the upper 75 m warmed by 0.11°C per decade over the period 1971 to 2010 (IPCC, 2014).

Ocean Acidification: About 30% of anthropogenic CO_2 emissions has been absorbed by the oceans. This leads to ocean acidification. The green curve in the figure 15 shows the decreasing pH of ocean surface water since the late 1980s. According to the IPCC, the pH of ocean surface water has decreased by 0.1 since the beginning of the industrial era (IPCC, 2014).

Sea Level Rise: The rate of sea level rise since the mid-19th century has been larger than the mean rate during the previous two millennia. Over the past century, global mean sea level rose by 0.19m. Glacier mass loss and ocean thermal expansion from warming together explain about 75% of the observed global mean sea-level rise since the early 1970s (figure 16) (IPCC, 2014).

Arctic Ice Melting: Over the last two decades, the Greenland and Antarctic ice sheets have been losing mass, glaciers have continued to shrink almost worldwide, and Arctic sea ice has continued to decrease in extent. The graph illustrates the decrease in summer sea ice extent in the Artic between 1900 and 2010. The spatial extent has decreased in every season since 1979 (IPCC, 2014).

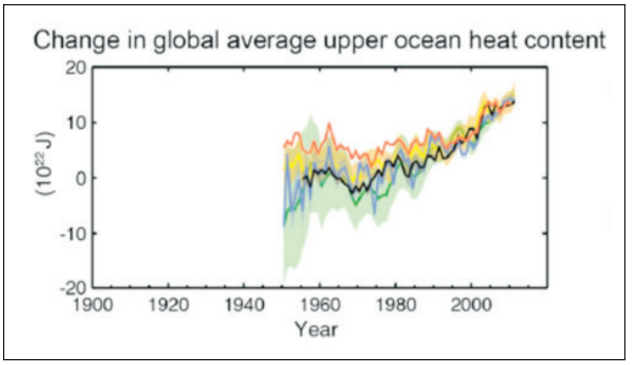


Figure 14: Observed Ocean Warming: 1950- 2010 (IPCC, 2014)

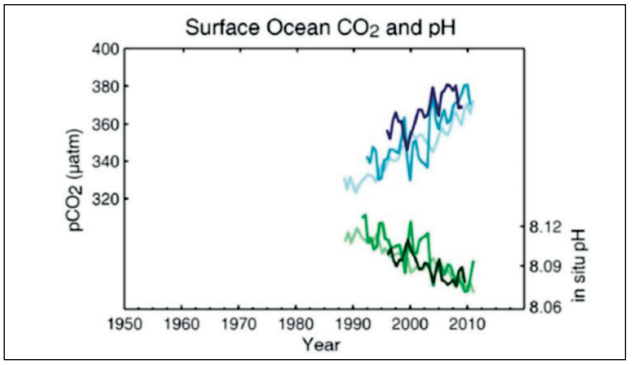


Figure 15: Observed Ocean Acidification (IPCC, 2014)

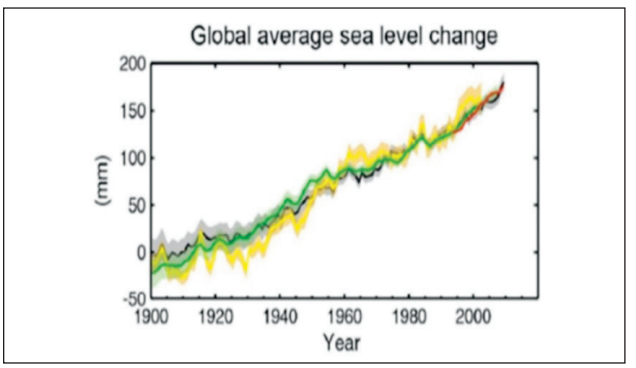


Figure 16: Observed Sea Level Rise (IPCC, 2014)

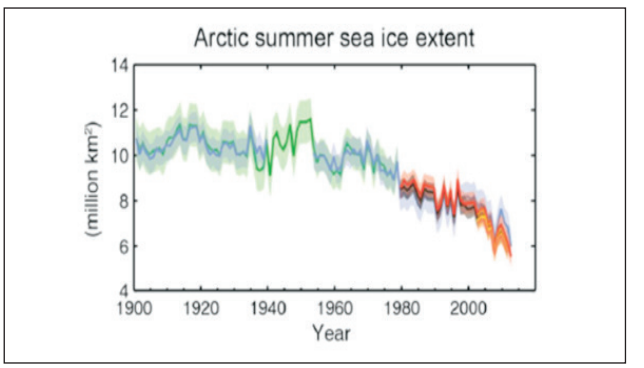


Figure 17: Observed Arctic Sea Ice Extent (IPCC, 2014)

Impacts of Climate Change: 'The Stern Review'

'The Stern Review', released in 2006 for the UK government by Sir Nicholas Stern pointed out the impacts of climate change (British Broadcasting Company, 2006). Key points of the impacts are in table 5:

Table 5: Key Points of Impacts of Climate Change: 'The Stern Review'

Temperature	• Carbon emissions have already pushed up global temperatures by around one degree Celsius If no action is taken on emissions, there is more than a 75% chance of global temperatures rising between 2^0C -3^0C over the next 50 years • There is a 50% chance that average global temperatures could rise by five degrees Celsius
Environmental Impacts	• Melting glaciers will increase flood risk • Crop yields will decline, particularly in Africa • Rising sea levels could leave 200 million people permanently displaced • Up to 40% of species could face extinction • There will be more examples of extreme weather patterns
Economic Impacts	• Extreme weather could reduce global gross domestic product (GDP) by up to 1% • A two to three degrees Celsius rise in temperatures could reduce global economic output by 3% • If temperatures rise by five degrees Celsius, up to 10% of global output could be lost. The poorest countries would lose more than 10% of their output. • In worst case scenario, global consumption per head would fall by 20% To stabilize at manageable levels, emissions would need to stabilize in the next 20 years and fall between 1% and 3% after that. This would cost 1% of GDP

IPCC Special Report on Impacts of Global Warming of 1.5 °C

The Intergovernmental Panel on Climate Change (IPCC) released a special report in 2018, on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. This report was formally approved at the First Joint Session of Working Groups I, II and III of the IPCC and accepted by the 48th Session of the IPCC, Incheon, Republic of Korea, 6 October 2018.

Box 6: Projected Impacts of Global Warming by 1.5 °C vs by 2 °C

By 2100, global mean sea level rise is projected to be around 0.1 meters lower with global warming of 1.5°C compared to 2°C

Limiting global warming to 1.5°C compared to 2°C is projected to lower the impacts on terrestrial, freshwater, and coastal ecosystems and to retain more of their services to humans.

Limiting global warming to 1.5°C compared to 2°C is projected to reduce increases in ocean temperature as well as associated increases in ocean acidity.

Global fishery model projected a decrease in a global annual catch for marine fisheries of about 1.5 million tons for 1.5°C of global warming compared to a loss of more than 3 million tons for 2°C of global warming.

Climate-related risks for natural and human systems are higher for global warming of 1.5°C than at present but lower than at 2°C. These risks depend on the magnitude and rate of warming, geographic location, levels of development and vulnerability, and on the choices and implementation of adaptation and mitigation options. Climate models project robust differences in regional climate characteristics between present-day and global warming of 1.5°C and between 1.5°C and 2°C. These differences include increases in:

- mean temperature in most land and ocean regions
- hot extremes in most inhabited regions
- heavy precipitation in several regions, and
- the probability of drought and precipitation deficits in some regions.

Global Mean Sea Level Rise

By 2100, global mean sea level rise is projected to be around 0.1 meters lower with global warming of 1.5°C compared to 2°C. Sea level will continue to rise well beyond 2100, and the magnitude and rate of this rise depend on future emission pathways. A slower rate of sea level rise enables greater opportunities for adaptation in the human and ecological systems of small islands, low-lying coastal areas, and deltas. A reduction of 0.1 meters in global sea level rise implies that up to 10 million fewer people would be exposed to related risks, based on population in the year 2010.

Impacts on Biodiversity and Ecosystems on Land

Limiting global warming to 1.5°C compared to 2°C is projected to lower the impacts on terrestrial, freshwater, and coastal ecosystems and to retain more of their services to humans. Of 105,000 species studied, 6% of insects, 8% of plants and 4% of vertebrates are projected to lose over half of their climatically determined geographic range for global warming of 1.5°C, compared with 18% of insects, 16% of plants and 8% of vertebrates for global warming of 2°C. Impacts associated with other biodiversity-related risks such as forest fires, and the spread of invasive species, are lower at 1.5°C compared to 2°C of global warming.

Impacts on Biodiversity and Ecosystems on Marine

Limiting global warming to 1.5°C compared to 2°C is projected to reduce increases in ocean temperature as well as associated increases in ocean acidity and decreases in ocean oxygen levels. Consequently, limiting

global warming to 1.5°C is projected to reduce risks to marine biodiversity, fisheries, and ecosystems, and their functions and services to humans. Impacts of climate change in the ocean are increasing risks to fisheries and aquaculture via impacts on the physiology, survivorship, habitat, reproduction, disease incidence, and risk of invasive species. One global fishery model, for example, projected a decrease in a global annual catch for marine fisheries of about 1.5 million tons for 1.5°C of global warming compared to a loss of more than 3 million tons for 2°C of global warming.

Impacts on Health and Food Security

Climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C. Any increase in global warming is projected to affect human health, with primarily negative consequences. Lower risks are projected at 1.5°C than at 2°C for heat-related morbidity and mortality. Urban heat islands often amplify the impacts of heatwaves in cities. Risks from some vector-borne diseases, such as malaria and dengue fever are projected to increase with warming from 1.5°C to 2°C.

Limiting warming to 1.5°C, compared with 2°C, is projected to result in smaller net reductions in yields of maize, rice, wheat, and potentially other cereal crops, particularly in sub-Saharan Africa, Southeast Asia, and Central and South America; and in the CO_2 dependent, nutritional quality of rice and wheat. Reductions in projected food availability are larger at 2°C than at 1.5°C of global warming in the Sahel, southern Africa, the Mediterranean, central Europe, and the Amazon. Livestock are projected to be adversely affected by rising temperatures, depending on the extent of changes in feed quality, the spread of diseases, and water resource availability.

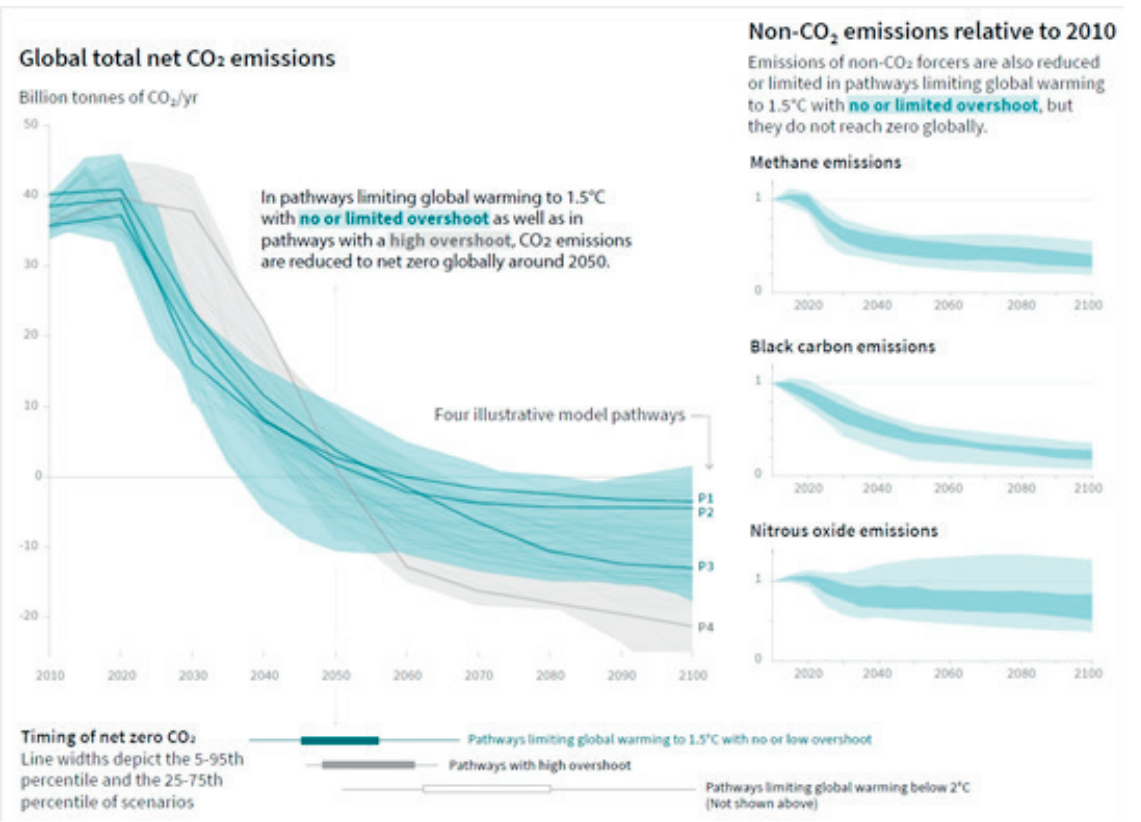


Figure 18: Global emissions pathway characteristics. The main panel shows global net anthropogenic CO_2 emissions in pathways limiting global warming to 1.5°C with no or limited (less than 0.1°C) overshoot and pathways with higher overshoot. The shaded area shows the full range for pathways analyzed in this report.

Pathways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems. These systems transitions are unprecedented in terms of scale, but not necessarily in terms of speed, and imply deep emissions reductions in all sectors, a wide portfolio of mitigation options and a significant upscaling of investments in options.

Global model pathways limiting global warming to 1.5°C are projected to involve the annual average investment needs in the energy system of around 2.4 trillion USD 2010 between 2016 and 2035 representing about 2.5% of the world GDP.

Strengthening the Global Response

Estimates of the global emissions outcome of current nationally stated mitigation ambitions as submitted under the Paris Agreement would lead to global greenhouse gas emissions in 2030 of 52–58 $GtCO_2eq\ yr\text{-}1$. Pathways reflecting these ambitions would not limit global warming to 1.5°C, even if supplemented by very challenging increases in the scale and ambition of emissions reductions after 2030. Avoiding overshoot and reliance on future large-scale deployment of carbon dioxide removal (CDR) can only be achieved if global CO_2 emissions start to decline well before 2030.

Climate change impacts and responses are closely linked to sustainable development which balances social well-being, economic prosperity and environmental protection.

The consideration of ethics and equity can help address the uneven distribution of adverse impacts associated with 1.5°C and higher levels of global warming, as well as those from mitigation and adaptation, particularly for poor and disadvantaged populations, in all societies. Mitigation and adaptation consistent with limiting global warming to 1.5°C, are underpinned by enabling conditions, assessed in SR1.5 across the geophysical, environmental-ecological, technological, economic, socio-cultural and institutional dimensions of feasibility. Following are enabling conditions that enhance the feasibility of mitigation and adaptation options for 1.5°C consistent systems transitions.

- Strengthened multi-level governance
- institutional capacity
- policy instruments
- technological innovation and transfer and mobilization of finance, and
- changes in human behavior and lifestyles

A mix of adaptation and mitigation options to limit global warming to 1.5°C, implemented in a participatory and integrated manner, can enable rapid, systemic transitions in urban and rural areas. These are most effective when aligned with economic and sustainable development, and when local and regional governments and decision makers are supported by national governments.

3.1.3 Climate Change Impacts and Vulnerabilities: Social and Economic Sectors

Climate change in the form of higher maximum temperatures, changing precipitation patterns, melting of snow and ice, sea level rise, changes in the frequency and intensity of extreme *weather* events, etc. will impact nearly all social and economic sectors (figure 19). For example, it is likely that future typhoons and hurricanes will become more intense, with major impacts for spatial planning and disaster risk reduction. The global average surface air temperature is estimated to increase between 1.1°C and 6.4°C by 2100, with significant consequences for sectors such as agriculture, health, water, forestry, etc (IPCC, 2007).

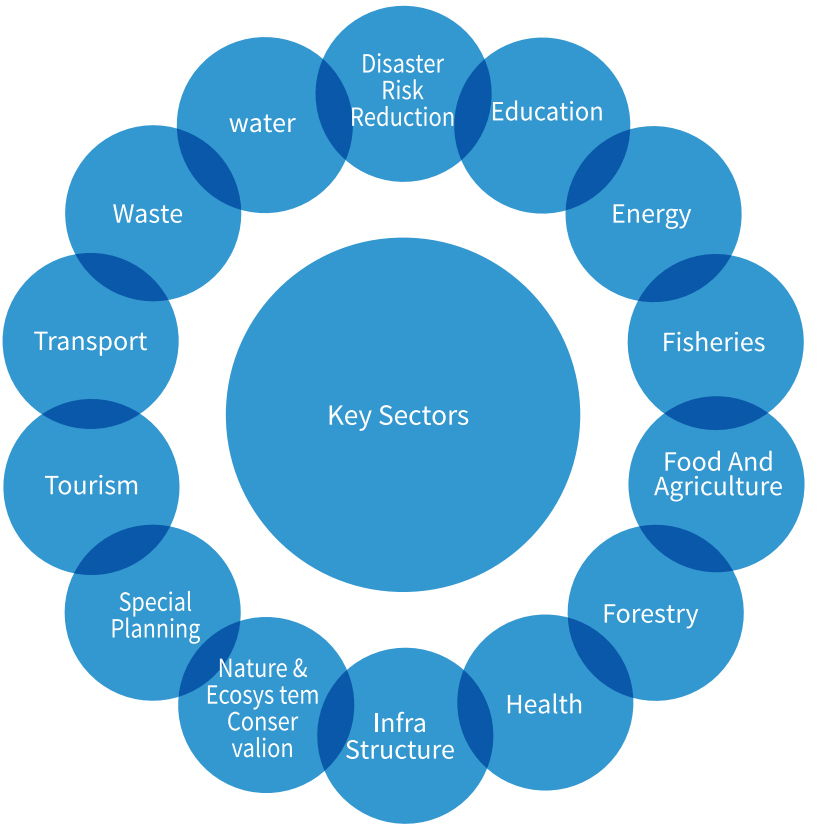


Figure 19: Key Sector Affects the Climate Changes by UNITAR

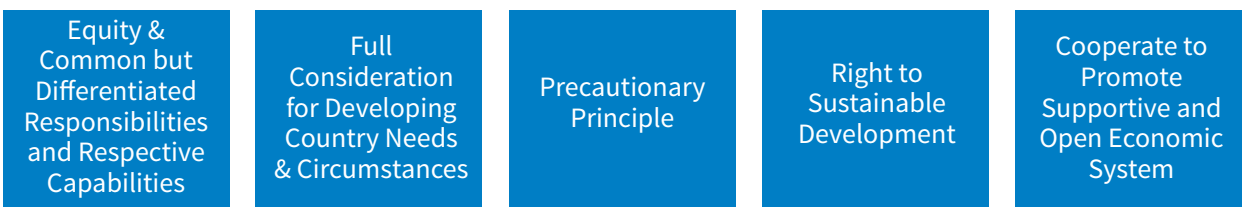
Topic 3.2:
UN Framework Convention on Climate Change (UNFCCC)

3.2.1 Genesis

Climate change entered the international political consciousness in 1990 when the Intergovernmental Panel on Climate Change (IPCC) released its First Assessment Report. Despite a degree of scientific uncertainty First Assessment Report of the IPCC concluded that anthropogenic greenhouse gas emissions appeared to be contributing to rising global temperatures and that climate change should be an issue of international concern. The Intergovernmental Negotiating Committee (INC) was formed in 1990 by the United Nations General Assembly Resolution (Resolution No.45/21- A/RES/45/212) to develop a Framework Convention on Climate Change. The INC met for five sessions between February 1991 and May 1992 and the United Nation Framework Convention on Climate Change (UNFCCC, hereinafter referred to as Convention) was adopted in Rio de Janeiro at Earth Summit, where 154 states signed it. The Convention entered into force on 21 March 1994 when the fiftieth State's instrument of ratification had been deposited.

3.2.2 Objective, Principles and Commitments of the Convention

According to Article 2, objective is "to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic [originating in human activity] interference with the climate system". This objective is qualified in that it "should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner". To achieve this objective, all Parties to the Convention – those countries that have ratified, accepted, approved, or acceded to, the treaty – are subject to an important set of general commitments based on some common principles which place a fundamental obligation on both industrialized and developing countries to respond to climate change.



The principles of the Convention are stipulated in Article 3, which also states that these principles inter alia shall guide the actions of Parties, and thus do not constitute an exhaustive list. Article 3.1 stresses the principles of Equity, Common but Differentiated Responsibilities (CBDR) and Respective Capacities (RC). The Principles stipulated in Article 3 are as follows:

The principle of equity guides Parties to protect the climate system for both present generations (intra-generational equity) and future generations (inter-generational equity.) At the same time, the Convention puts forward the principle of common but differentiated responsibilities which reflects the idea that Parties' responsibility towards responding to climate change should be shared based on both the historical and current contributions to the problem, as well as their capacity to respond to the problem. This principle has several applications in the Convention and developed countries are to take the lead in responding to climate change (UNFCCC, 1992).

Similarly, Article 3 sets out that full consideration should be given to the special needs and circumstances of developing countries. In accordance with the precautionary principle, the lack of scientific certainty should

not prevent Parties from taking cautionary measures if the likelihood of serious damage to the environment exists. Other guiding principles focus on the importance of the right to sustainable development and the duty of Parties to the Convention to cooperate to promote a supportive and open international economic system that will lead to sustainable growth and development in all Parties, particularly developing country Parties (UNFCCC, 1992).

3.2.3 Parties to the Convention

In the context of the Convention, these principles have several applications. Past and present GHG emissions are distributed unevenly among Parties and Parties have different capacities and resources to address the causes and effects of climate change. Article 3.1 thus calls on industrialized countries to "take the lead in combating climate change and the adverse effects thereof". This is reflected in the Convention by differentiating between Annex I Parties and those Parties not listed in Annex I to the Convention (non-Annex I Parties). The Convention currently lists 41 Annex I Parties. These are the industrialized countries who have historically contributed the most to climate change. They include both the relatively wealthy industrialized countries that were members of the Organization for Economic Co-operation and Development (OECD) in 1992, plus countries with economies in transition (the EITs), including the Russian Federation, the Baltic States, and several Central and Eastern European States.

Box 7: Parties to the Convention

Annex I Parties: Group of 43 developed countries, that were part of the OECD in 1992, and countries with economies in transition (EIT)

http://unfccc.int/parties_and_observers/parties/annex_i/items/2774.php

Annex II Parties: Group of 24 developed countries but not countries with EIT (subset of Annex I countries)

http://unfccc.int/parties_and_observers/items/2704.php

Non-Annex I Parties: Mostly developing countries

http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php

Further differentiation occurs within Annex I. On one hand, Parties listed in Annex II to the Convention (Annex II Parties) are required to provide financial assistance and facilitate the transfer of technologies to developing countries to help them implement their commitments under the Convention. On the other hand, the group of countries with Economies In Transition (EITs) is granted a certain degree of flexibility in implementing their commitments, because of recent economic and political upheavals in those countries. In accordance with Article 4, the commitments of Annex I and II countries are as follows:

- Adopt national mitigation policies
- Provide new and additional financial resources for developing countries
- Assist developing country Parties particularly vulnerable to climate change in meeting the costs of adaptation through providing;
- Support and means of implementation-finance, technology development, and transfer and capacity building
- Take all practicable steps to promote, facilitate and finance the transfer of technology

3.2.4 Institutional Arrangements of the Convention

Several institutions and bodies work within the framework of the Convention (figure 20). These include those established by the Convention – the Conference of the Parties to the Convention (COP), the subsidiary bodies (SBs), the Bureau and the secretariat. They also include other bodies established by the COP, in accordance with Article 7.2(i) of the Convention: committees, working groups, and expert bodies.

The Conference of the Parties (COP)

The climate change process revolves around the annual sessions of the COP, which bring together all countries that are Parties to the Convention. Article 7.2 defines the COP as the "supreme body" of the Convention, as it is its highest decision-making authority. The COP is responsible for keeping international efforts to address climate change on track. It reviews the implementation of the Convention and examines the commitments of Parties in light of the Convention's objective, new scientific findings, and experience gained in implementing climate change policies.

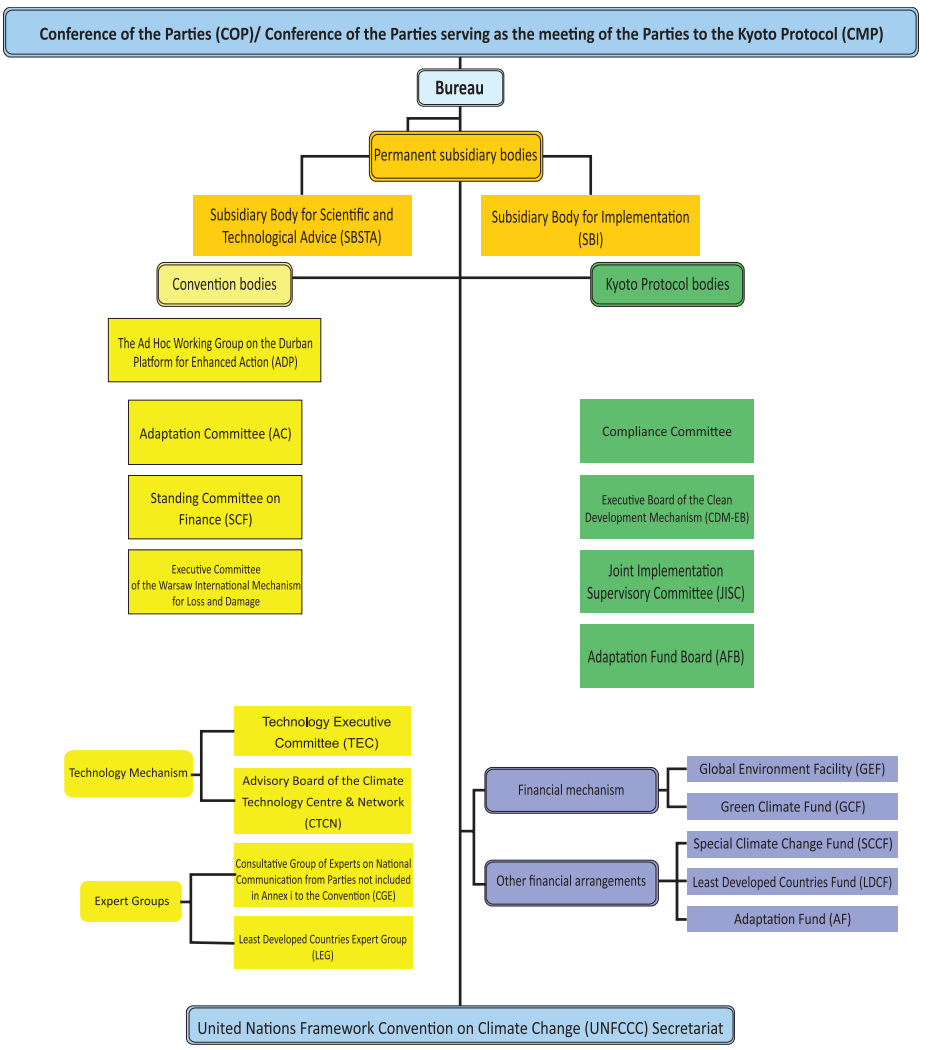


Figure 20: Institutions of the Convention and the Kyoto Protocol

Convention's objective, new scientific findings, and experience gained in implementing climate change policies.

A key task for the COP is to review the national communications and emission inventories submitted by Parties. Based on this information, the COP assesses the effects of the measures taken by Parties and the progress made in achieving the ultimate objective of the Convention. The COP meets every year unless the Parties decide otherwise. The COP meets in Bonn, the seat of the Secretariat unless a Party offers to host the session. Just as the COP Presidency rotates among the five recognized UN regions - Africa, Asia, Latin America, and the Caribbean, Central and Eastern Europe and Western Europe and Others – there is a tendency for the venue of the COP to also shift among these groups.

Table 6: Milestones in the Climate Change Regime

1988	*UN General Assembly* characterizes climate change a 'common concern of mankind'. The Inter-governmental Panel on Climate Change (IPCC) was established
1990	*Intergovernmental Panel on Climate Change* issues first assessment report, estimating that global mean temperature likely to increase by about 0.3^0 C per decade, under business as usual emission scenario
1990	*UN General Assembly* establishes Intergovernmental Negotiation Committee to negotiate a climate change convention
1992	Framework Convention on Climate Change (FCCC) opened for signature at Rio Summit
1994	FCCC enters into force
1995	First Conference of Parties to the FCCC adopts Berlin Mandate authorizing negotiations to strengthen FCCC commitments
1997	Third conference of parties to the FCCC adopts the Kyoto Protocol introducing GHG targets for developed countries parties for first commitment period from 2008-2012
2001	Seventh conference of parties to the FCCC adopts Marrakesh accords, spelling out the details rules for the operationalization of the Kyoto mechanism (Joint Implementation, Clean Development Mechanism and Emission Trading) as well as for a compliance mechanism for the Kyoto Protocol
2005	Kyoto Protocol enter into force
2005	Frist meeting of parties to the Kyoto protocol launches negotiations toward the second commitment period for Kyoto
2007	Thirteenth Conference of the Parties to the FCCC adopts the Bali action plan, initiating a new round of negotiations towards an 'agreed outcome'
2009	Fifteenth Conference of Parties takes note of the Copenhagen Accord, reached between 28 Heads of States, containing voluntary mitigation pledges.
2010	Sixteenth Conference of Parties adopts the Cancun agreements, incorporating elements of the Copenhagen accord into the FCCC process, including by taking note of the mitigation pledges under the Copenhagen accord, housed in information documents
2011	Seventeenth Conference of Parties adopts the Durban platform launching negotiations with a scheduled end in 2015 toward an agreement to take effect from 2020
2012	Eighth meeting of Parties to the Kyoto Protocol extends the Kyoto Protocol for a second Commitment period from 2012 to 2020

2013	Nineteenth Conference of Parties in Warsaw invites parties to prepare and submit 'intended nationally determined contributions' in the context of a 2015 agreement
2014	Twentieth Conference of Parties arrives at the Lima Call to Climate Action, setting the stage for the 2015 agreement, and providing cautious guidance on the 'Intended nationally determined contributions'
2015	The Paris Agreement is adopted, and adoption decision provided guidance for related issues of the Paris Agreement.
2016	The Conference successfully demonstrated to the world that the implementation of the Paris Agreement is underway and the constructive spirit of multilateral cooperation on climate change continues.
2017	The Rulebook for implementing of the Paris Agreement is structured as to 'Fiji Momentum for Implementation' for further development and adopted in 2018.
2018	Rulebook for the implementation of the Paris Agreement was adopted. However, some of the elements of the rule book will be finalized later on. Such as article 6 of the Paris agreement yet not finalized.

Subsidiary Bodies (SBs)

The Convention establishes two permanent subsidiary bodies (SBs), namely the Subsidiary Body for Scientific and Technological Advice (SBSTA), by Article 9, and the Subsidiary Body for Implementation (SBI), by Article 10. These bodies advise the COP. In accordance with Articles 9.1 and 10.1, they are both multidisciplinary bodies open to participation by any Party, and governments send representatives with relevant expertise.

The SBSTA's task is to provide the COP with advice on scientific, technological and methodological matters. Two key areas of work in this regard are promoting the development and transfer of environmentally-friendly technologies and conducting technical work to improve the guidelines for preparing national communications and emission inventories. The SBSTA also carries out methodological work in specific areas, such as the LULUCF sector, HFCs and PFCs, and adaptation and vulnerability. In addition, the SBSTA plays an important role as the link between the scientific information provided by expert sources such as the IPCC on the one hand, and the policy-oriented needs of the COP on the other. It works closely with the IPCC, sometimes requesting specific information or reports from it, and also collaborates with other relevant international organizations that share the common objective of sustainable development (UNFCCC, 1992).

On the other hand, the SBI gives advice to the COP on all matters concerning the implementation of the Convention. A particularly important task in this respect is to examine the information in the national communications and emission inventories submitted by Parties to assess the Convention's overall effectiveness. The SBI reviews the financial assistance given to non-Annex I Parties to help them implement their Convention commitments and provides advice to the COP on guidance to the financial mechanism (operated by the GEF). The SBI also advises the COP on budgetary and administrative matters.

The SBSTA and SBI work together on cross-cutting issues that touch on both their areas of expertise. These include capacity building, the vulnerability of developing countries to climate change and response measures, and the Kyoto Protocol mechanisms. The SBSTA and the SBI have traditionally met in parallel, at least twice a year. When they are not meeting in conjunction with the COP, the subsidiary bodies usually convene at the seat of the secretariat. In addition to the SBSTA and the SBI, the COP may establish additional bodies as needed.

Consultative Group of Experts

The Consultative Group of Experts on National Communications from Non-Annex I Parties (CGE) was set up by COP 5 in 1999 to help improve the process of preparing national communications from non-Annex I Parties under the Convention. It meets twice a year, in conjunction with sessions of the subsidiary bodies, and also holds workshops to gather regional expertise. It is composed of five experts from each of the developing country UN regions (Africa, Asia, and Latin America and the Caribbean), six experts from Annex I Parties, and three experts from organizations with relevant experience. At COP 7, the CGE was given an additional mandate to look at technical problems and constraints that have affected the preparation of initial national communications by that non-Annex I Parties that have not yet completed them. It was also asked to provide input to the on-going review and improvement of the guidelines for the preparation of non-Annex I Party national communications. The CGE reports to the SBI; its mandate and terms of reference will be reviewed again by COP 8 (UNFCCC, 1992).

Least Developed Country Expert Group (LEG)

The objective of the least developed country expert group, established as part of the Marrakesh Accords, is to provide advice to LDCs on the preparation and implementation of national adaptation programmes of action. It is composed of 12 experts, including five from African LDC Parties, two from Asian LDC Parties, two from small island LDC Parties, and three from Annex II Parties. In order to ensure linkages between the LDC expert group and the CGE on adaptation issues, at least one member of the LDC expert group from an LDC and one from an Annex II Party are also members of the CGE. The LDC expert group meets twice a year. It reports to the SBI and will be reviewed by COP 9.

Political Negotiating Groups

Most Parties belong to political negotiating groups, formed on the basis of their common interests. There is no formal process for establishing these groups. Parties decide to form them and inform the COP Bureau, the SBs or the Secretariat. They meet informally during sessions of the COP or the SBs. Their purpose is to exchange information and, quite often, to share information on common issues, and, in some instances, develop and agree on common positions.

Group of 77 and China

The G-77 was founded in 1964 in the context of the United Nations Conference on Trade and Development (UNCTAD) and now functions throughout the United Nations system, comprising 132 members. It consists of small island countries, oil-exporting countries, LDCs, industrializing countries, and middle-income countries. The country holding the Chair of the group often speaks for the G-77 and China as a whole, provided China was present in the discussions of the group. It only speaks on behalf of the group on issues on which there is a previous agreement. If there is no agreement, each country or group of countries are free to take a different position. Accordingly, individual members intervene in debates, as do groups within the G-77 and China, such as the African Group, the Alliance of Small Island States (AOSIS) and the group of Least Developed Countries.

Least Developed Countries (LDCs)

The 49 countries defined as LDCs by the United Nations are also Convention Parties, except for one state (Somalia). They include members of the African Group, the Alliance of Small Island States (AOSIS) and others. They are increasingly active in the climate change process, often working together to defend their particular interests, in, for example, vulnerability and adaptation to climate change. The particular situation of LDCs is recognized by the Convention (Article 4.9, Article 12.5).

The African Group

The African Group is the only regional group working as an active negotiating group. It consists of 53 members. They have various common concerns, including the lack of resources and vulnerability to extreme weather. The group often makes common statements on various issues, such as capacity-building and technology transfer.

The Alliance of Small Island States (AOSIS)

The Alliance of Small Island States (AOSIS) is an alliance of 43 small island states and low-lying coastal countries that share similar development challenges and environmental concerns, especially their vulnerability to the adverse effects of global climate change. This group was established in November 1990 during the Second World Climate Conference. The AOSIS countries, united by the threat that climate change poses to their survival, frequently adopt a common stance in negotiations. They were the first to propose a draft text, during the Kyoto Protocol negotiations, calling for cuts in carbon dioxide emissions of 20 percent from 1990 levels by 2005. Most of the AOSIS members also belong to the SIDS.

European Union (EU)

While the European Community, represented by the European Commission, has become a Party to the Convention as a regional economic integration organization, the association formed by its Member States is commonly referred to as the European Union (EU) 16. The 25 EU Member States, plus the European Commission, meet in private to agree on common positions. The country that holds the EU Presidency – a position that rotates every six months – speaks for the European Community and its Member States. Additionally, individual Member States have been appointed to take the lead in bilateral negotiations with other states or groups and may act as leaders on issues.

Umbrella Group

The Umbrella Group is a coalition of Parties which formed following the adoption of the Kyoto Protocol. The Group is made up of Australia, Belarus, Canada, Iceland, Israel, Japan, New Zealand, Kazakhstan, Norway, the Russian Federation, Ukraine, and the United States.

Other Groups

Several other groups also work together in the climate change process, including countries from the Organization of Petroleum Exporting Countries (OPEC), a group of countries of Central Asia, Caucasus, Albania and Moldova (CACAM), the Cartagena Dialogue, the Independent Alliance of Latin America and the Caribbean (AILAC), the BASIC Group (Brazil, South Africa, China India), the Like-Minded Group, the Coalition for Rainforest Nations, Arab group and the Bolivarian Alliance for the Peoples of our America.

3.2.5 Major COP Decisions (COP1 - COP 24)

Table 7: Major COP Decisions (COP1 - COP 24) of UNFCCC

COP Meeting	Key Decisions
COP 24 2-14 December 2018 Katowice, Poland	At 24th Conference of the Parties (COP24) under UNFCCC on 15 December 2018, on a proposal by the COP President, the COP24 adopted decision 1/CP.24, entitled "Preparations for the implementation of the Paris Agreement and the first session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA1)". By this decision, the COP24 forwarded draft decisions on detailed rules and guidelines under the Paris Agreement Work Program (PAWP), commonly referred to by the President as the Katowice Rulebook, for consideration and adoption by the CMA1. On a proposal by the President, the CMA1 adopted decision 3/CMA.1, entitled "Matters relating to the implementation of the Paris Agreement", in which it decided to adopt the following decisions on detailed rules and guidelines, commonly referred to by the President as the Katowice Rulebook: (a) Decision 4/CMA.1, entitled "Further guidance in relation to the mitigation section of decision 1/CP.21"; (b) Decision 5/CMA.1, entitled "Modalities and procedures for the operation and use of a public registry referred to in Article 4, paragraph 12, of the Paris Agreement"; (c) Decision 6/CMA.1, entitled "Common time frames for nationally determined contributions referred to in Article 4, paragraph 10, of the Paris Agreement"; (d) Decision 7/CMA.1, entitled "Modalities, work programme and functions under the Paris Agreement of the forum on the impact of the implementation of response measures"; (e) e) Decision 8/CMA.1, entitled "Matters relating to Article 6 of the Paris Agreement and paragraphs 36–40 of decision 1/CP.21"; (f) Decision 9/CMA.1, entitled "Further guidance in relation to the adaptation communication, including, inter alia, as a component of nationally determined contributions, referred to in Article 7, paragraphs 10 and 11, of the Paris Agreement"; (g) Decision 10/CMA.1, entitled "Modalities and procedures for the operation and use of a public registry referred to in Article 7, paragraph 12, of the Paris Agreement"; (h) Decision 11/CMA.1, entitled "Matters referred to in paragraphs 41, 42 and 45 of decision 1/CP.21"; (i) Decision 12/CMA.1, entitled "Identification of the information to be provided by Parties in accordance with Article 9, paragraph 5, of the Paris Agreement"; (i) Decision13/CMA.1, entitled "Matters relating to the Adaptation Fund"; (j) Decision 14/CMA.1, entitled "Setting a new collective quantified goal on finance in accordance with decision 1/CP.21, paragraph 53;

	(j) Decision 15/CMA.1, entitled "Scope of and modalities for the periodic assessment referred to in paragraph 69 of decision 1/CP.21"; (j) Decision 16/CMA.1, entitled "Technology framework under Article 10, paragraph 4, of the Paris Agreement"; (j) Decision 17/CMA.1, entitled "Ways of enhancing the implementation of education, training, public awareness, public participation and public access to information so as to enhance actions under the Paris Agreement"; (j) Decision 18/CMA.1, entitled "Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement"; (j) Decision 19/CMA.1, entitled "Matters relating to Article 14 (global stocktake) of the Paris Agreement and paragraphs 99–101 of decision 1/CP.21"; (j) Decision 20/CMA.1, entitled "Modalities and procedures for the effective operation of the committee to facilitate implementation and promote compliance referred to in Article 15, paragraph 2, of the Paris Agreement"
COP23 06 Nov – 18 Nov 2017 Bonn, Germany	Decision 1/CP.23: Fiji momentum for implementation Confirms the goal to adopt the Paris Rulebook at COP24 next year in Katowice, Poland, also sets out the design of the facilitative dialogue – now renamed the Talanoa dialogue – which will launch in January. This also clarifies that global stock takes on pre-2020 efforts will occur at both COP24 and COP25 (IETA 2017). Decision 3/CP.23: Establishment of a gender action plan Adopts the gender action plan, under the Lima work programme on gender to support the implementation of gender-related decisions and mandates in the UNFCCC process. Decision 4/CP.23: Koronivia joint work on agriculture Invites Parties and observers to submit by 31 March 2018, their views on elements to be included in the work, starting with but not limited to the following: a) Modalities for implementation of the outcomes of the five in-session workshops on issues related to agriculture and other future topics that may arise from this work; b) Methods and approaches for assessing adaptation, adaptation co-benefits and resilience; c) Improved soil carbon, soil health and soil fertility under grassland and cropland as well as integrated systems, including water management; d) Improved nutrient use and manure management towards sustainable and resilient agricultural systems; e) Improved livestock management systems; Socioeconomic and food security dimensions of climate change in the agricultural sector; <u>Spotlight Discussion</u> USA's Pledge: The USA presented a report on the ongoing efforts by American states, cities, businesses and civil society to uphold the emissions reduction target of the United States under the Paris Agreement.

COP 22 07 Nov – 18 Nov 2016 Marrakech, Morocco	Decision 1/CP.22: Preparations for the entry into force of the Paris Agreement and the first session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement Decides to convene, at its twenty-third session (November 2017), a joint meeting with the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement, to review progress on the implementation of the work programme under the Paris Agreement. Decision 3/CP.22: Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts Encourages Parties to incorporate or continue to incorporate the consideration of extreme events and slow onset events, non-economic losses, displacement, migration and human mobility, and comprehensive risk management into relevant planning and action, as appropriate, and to encourage bilateral and multilateral entities to support such efforts. Decision 7/CP.22: Long-term climate finance Decides that the in-session workshops on long-term climate finance in 2017 and 2018 will, with a view to scaling up climate finance for mitigation and adaptation, focus on experiences and lessons learned from: a) Articulating and translating needs identified in country-driven processes into projects and programmes; b) Roles of policies and enabling environments for mitigation and adaptation finance; Facilitating enhanced access;
COP 21 30 Nov - 11 Dec 2015 Paris, France	Decision 1/CP.21: Adoption of the Paris Agreement • To adopt the Paris Agreement under the United Nations Framework Convention on Climate Change (“the Agreement”). • Parties shall submit their nationally determined contributions referred to in Article 4 of the Agreement at least 9 to 12 months in advance of the relevant session of the Conference of the Parties to the Secretariat. • In the implementation of the Agreement, financial resources provided to developing country Parties should enhance the implementation of their policies, strategies, regulations and action plans and their climate change actions with respect to both mitigation and adaptation to contribute to the achievement of the purpose of the Agreement as defined in its Article 2. Decision 4/CP.21: National adaptation plans Parties and relevant organizations are invited to submit information on their progress made towards the achievement of the objectives of the process to formulate and implement national adaptation plans, experiences, best practices, lessons learned, gaps and needs, and support provided and received in the process to formulate and implement national adaptation plans to the Secretariat, by 1 February 2018.

COP20 1 to 14 Dec 2014 Lima, Peru	Decision 1/CP.20: Lima Call for Climate Action • Information to be provided by Parties communicating their intended nationally determined contributions, in order to facilitate clarity, transparency and understanding, may include, as appropriate, inter alia, quantifiable information on the reference point (including, as appropriate, a base year), time frames and/or periods for implementation, scope and coverage, planning processes, assumptions and methodological approaches including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals. • Publish on the UNFCCC website the intended nationally determined contributions as communicated.
COP19 11 to 23 Nov 2013 Warsaw, Poland	Decision 17/CP.19: Nairobi work programme on impacts, vulnerability and adaptation to climate change Activities under the Nairobi work programme should integrate gender issues, indigenous and traditional knowledge, and the role of and impacts on ecosystems. Decision 21/CP.19: General guidelines for domestic measurement, reporting and verification of domestically supported nationally appropriate mitigation actions by developing country Parties.
COP18 11 to 23 Nov 2013 Warsaw, Poland	Decision 23/CP.18: Promoting gender balance and improving the participation of women in UNFCCC negotiations and in the representation of Parties in bodies established pursuant to the Convention or the Kyoto Protocol
COP 17 28 Nov - 09 Dec 2011 Durban, South Africa	Decision 3/CP.17: Launching the Green Climate Fund Decides to designate the Green Climate Fund as an operating entity of the financial mechanism of the Convention, in accordance with Article 11 of the Convention, with arrangements to be concluded between the Conference of the Parties and the Fund at the eighteenth session of the Conference of the Parties to ensure that it is accountable to and functions under the guidance of the Conference of the Parties to support projects, programmes, policies and other activities in developing country Parties.
COP 16 29 Nov - 10 Dec 2010 Cancun, Mexico	Decision 1/CP.16: The Cancun Agreements Decides to establish the Cancun Adaptation Framework encompassing with the objective of enhancing action on adaptation, including through international cooperation and coherent consideration of matters relating to adaptation under the UNFCCC. Established Green Climate Fund as the dedicated funding window under UNFCCC and also established the technology mechanism.
COP 15 07 - 19 Dec 2009 Copenhagen, Denmark	Decision 2/CP.15: Copenhagen Accord • Decides to pursue various approaches, including opportunities to use markets, to enhance the cost-effectiveness of, and to promote mitigation actions. Developing countries, especially those with low emitting economies should be provided incentives to continue to develop on a low emission pathway. • Scaled up, new and additional, predictable and adequate funding as well as improved access shall be provided to developing countries, in accordance with the relevant provisions of the Convention, to enable and support enhanced action on mitigation, including substantial finance to reduce emissions from deforestation and forest degradation (REDD-plus), adaptation, technology development and transfer and capacity-building, for enhanced implementation of the Convention.

COP 13 03 - 15 Dec. 2007 Bali, Indonesia	Decision 1/CP.13: Bali Action Plan Decides to launch a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision at its fifteenth session, by addressing, inter alia: (a) A shared vision for long-term cooperative action, including a long-term global goal for emission reductions, to achieve the ultimate objective of the Convention; (b) Enhanced national/international action on mitigation of climate change (c) Enhanced action on adaptation (d) Enhanced action on technology development and transfer to support action on mitigation and adaptation (e) Enhanced action on the provision of financial resources and investment to support action on mitigation and adaptation and technology cooperation
COP7 29 Oct - 10 Nov 2001 Marrakech, Morocco	THE MARRAKESH ACCORDS Decision 2/CP.7: Capacity building in developing countries (non-Annex I Parties) • Decides that this framework should guide capacity-building activities related to the implementation of the Convention and effective participation in the Kyoto Protocol process. • Decides to give immediate effect to this framework in order to assist developing countries to implement the Convention and to effectively participate in the Kyoto Protocol process • LDCF and SCCF established under GEF. Adaptation fund under KP also established.
COP3 01 Dec - 10 Dec 1997 Kyoto, Japan	Decision 1/CP.3: Adoption of the Kyoto Protocol to the UNFCCC The Protocol obliges industrialized countries and countries of the former Soviet bloc (known collectively as "Annex I Parties") to cut their emissions of greenhouse gases by an average of about 5% for the period 2008-2012 compared with 1990 levels.

Box 8: The Rulebook for Paris Agreement

The rulebook is a set of rules that define how the Parties (nations) of the Paris Agreement will record their emissions and progress toward climate goals and sets out mechanisms for the countries to ask for help if they fall behind. It also calls for countries to increase the ambition of their pledges over time. The rulebook aims to provide some homogeneity at the global level if all countries contribute to the fight against global warming. Also aiming to bring transparency and trust between the Parties, the rulebook says countries shall communicate their NDCs every five years, as of 2020 and report on their greenhouse gas emissions. Governments shall also publish a transparency report every two years. It also establishes the Global Stock take (GST) mechanism, which is to take place every five years, as of 2023. This will allow countries to compare and assess the progress made in a move meant to establish a cycle of positive actions whereby countries set and deliver increasing ambition. Common ground on guidelines implementing several reporting and transparency provisions.

A robust rulebook is a prerequisite for ensuring that the Paris Agreement can meet its potential, and that progress towards its long-term goals can be tracked over time. The Rulebook is agreed by the Parties at the UN climate summit (COP 24) in Katowice, Poland on 15 December 2018.

3.2.6 Kyoto Protocol under the Convention

Box 9: Kyoto Protocol

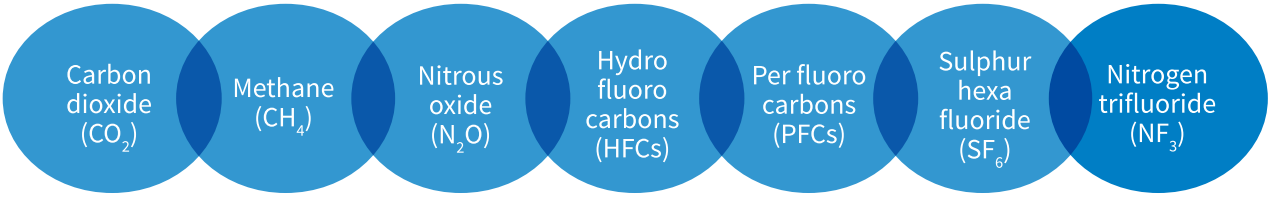
- International treaty linked to the UNFCCC
- Adopted at COP 3 in Kyoto, Japan, in 1997
- Entered into force in February 2005
- Currently 192 Parties
- First commitment period- 2008 – 2012
- Second commitment period - 2013 – 2020

The Kyoto Protocol (KP) is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets. Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere because of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities." The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. The detailed rules for the implementation of the Protocol were adopted at COP 7 in Marrakesh, Morocco, in 2001, and are referred to as the "Marrakesh Accords." Its first commitment period started in 2008 and ended in 2012.

In Doha, Qatar, on 8 December 2012, the Doha Amendment to KP was adopted. The amendment includes:

- New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from 1 January 2013 to 31 December 2020;
- A revised list of greenhouse gases (GHG) to be reported on by Parties in the second commitment period; and
- Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.
- On 21 December 2012, the amendment was circulated by the Secretary-General of the United Nations, acting in his capacity as Depositary, to all Parties to the Kyoto Protocol in accordance with Articles 20 and 21 of the Protocol. During the first commitment period, 37 industrialized countries and the European Community committed to reducing GHG emissions to an average of five percent against 1990 levels. During the second commitment period, Parties committed to reducing GHG emissions by at least 18 percent below 1990 levels in the eight-year period from 2013 to 2020; however, the composition of Parties in the second commitment period is different from the first. Under the Protocol, countries must meet their targets primarily through national measures. However, the Protocol also offers them an additional means to meet their targets by way of three market-based mechanisms.

Regulated Greenhouse Gases by Kyoto Protocol



Kyoto Protocol

Mitigation Commitments: 2008-2012	Mitigation Commitments: 2013-2020
☐ 37 industrialized countries and the European Community committed to: ○ Reduce their emissions by at least 5% below 1990 levels in the 2008-2012 period ○ Ensure their amount of CO_2 equivalent emissions do not exceed assigned amounts ☐ Each Kyoto Protocol Annex B Party had assigned amount units (AAUs) for the 2008-2012 commitment period	☐ Reduce GHG emissions by at least 18% below 1990 levels (Source: UNFCCC). 37 countries taking part in second commitment period account only for around 14% of world emissions.

Mechanisms of the Kyoto Protocol

The Clean Development Mechanism (CDM), defined in Article 12 of the Protocol, allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission-reduction project in developing countries. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one ton of CO2, which can be counted towards meeting Kyoto targets. The mechanism is seen by many as a trailblazer. It is the first global, environmental investment and credit scheme of its kind, providing standardized emissions offset instrument, CERs.

The mechanism known as "joint implementation," defined in Article 6 of the Kyoto Protocol, allows a country with an emission reduction or limitation commitment under the Kyoto Protocol (Annex B Party) to earn emission reduction units (ERUs) from an emission-reduction or emission removal project in another Annex B Party, each equivalent to one tone of CO_2, which can be counted towards meeting its Kyoto target. JI offers Parties a flexible and cost-efficient means of fulfilling a part of their Kyoto commitments, while the host Party benefits from foreign investment and technology transfer.

Parties with commitments under the Kyoto Protocol (Annex B Parties) have accepted targets for limiting or reducing emissions. These targets are expressed as levels of allowed emissions, or "assigned amounts," over the 2008-2012 commitment period. The allowed emissions are divided into "assigned amount units" (AAUs). Emissions trading, as set out in Article 17 of the Kyoto Protocol, allows countries that have emission units to spare - emissions permitted them but not "used" - to sell this excess capacity to countries that are over their targets. Thus, a new commodity was created in the form of emission reductions or removals. Since carbon dioxide is the principal greenhouse gas, people speak simply of trading in carbon. Carbon is now tracked and traded like any other commodity. This is known as the "carbon market."

Institutions of the Kyoto Protocol

The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP). The CMP meets annually during the same period as the COP. Parties to the Convention that are not Parties to the Protocol are able to participate in the CMP as observers but without the right to make decisions. The functions of the CMP relating to the Protocol are like those carried out by the COP for the Convention. The Parties to the Kyoto Protocol also formally adopted the "rulebook" of the 1997 Kyoto Protocol, the so-called 'Marrakesh accords', which sets the framework for implementation of the Protocol. The Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI), these two permanent subsidiary bodies established under the Convention also serve the CMP.

The Bureau of the COP also serves the CMP. However, any member of the COP Bureau representing a non-Party to the Kyoto Protocol should be replaced by a member representing a Kyoto Protocol Party.

The CDM Executive Board supervises the CDM under the Kyoto Protocol and prepares decisions for the COP/MOP (the COP will assume the COP/MOP's functions until the Protocol's entry into force). It undertakes a variety of tasks relating to the day-to-day operation of the CDM, including the accreditation of operational entities, pending their formal designation by the COP/MOP. The CDM's executive board is made up of ten members, including one from each of the five official UN regions, one from the small island developing states, and two members each from Annex I and non-Annex I Parties. When the Protocol enters into force, representatives from countries that have not become Parties to the Kyoto Protocol will be replaced. Each member of the executive board is accompanied by an alternate, from the same constituency. The executive board was elected at COP 7 and held its first meeting after the close of the session on 11 November 2001.

Supervisory Committee: The Kyoto Protocol's Article 6 supervisory committee will be established by COP/MOP 1. It will oversee a verification procedure for ERUs generated by joint implementation projects in host countries that are not fully meeting eligibility requirements relating to methodological and reporting obligations. The supervisory committee is composed of ten members, each accompanied by an alternate, including three from the EITs, three from Annex I Parties that are not EITs, three from non-Annex I Parties and one from the small island developing States.

The Compliance Committee for the Kyoto Protocol will begin operation after the Protocol's entry into force. It will function through a plenary, a bureau, a facilitative branch, and an enforcement branch. The committee is made up of twenty members, with ten serving in the facilitative branch and ten in the enforcement branch, each with an alternate. The composition of each branch is the same as the CDM executive board, that is, one member from each of the five official UN regions, one from the small island developing states, and two members each from Annex I and non-Annex I Parties. The plenary consists of the members of the two branches, with the Chairperson and Vice-Chairperson of each branch making up the Bureau. The plenary report on the activities of the Committee to the COP/MOP submits proposals on administrative and budgetary matters and applies general policy guidance received from the COP/MOP. The Committee will meet at least twice a year.

The Adaptation Fund (AF) was established in 2001 to finance concrete adaptation projects and programmes in developing country Parties to the Kyoto Protocol that are particularly vulnerable to the adverse effects of climate change. The Adaptation Fund is financed with a share of proceeds from the Clean Development Mechanism (CDM) project activities and other sources of funding. The share of proceeds amounts to 2 percent of certified emission reductions issued for a CDM project activity. The Adaptation Fund is supervised and managed by the Adaptation Fund Board (AFB). The AFB is composed of 16 members and 16 alternates and meets at least twice a year. At the third session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP), which was held in Bali, Indonesia from 3-14 December 2007, Parties in decision 1/CMP.3 decided to establish the Adaptation Fund Board (AFB) as the operating entity to supervise and manage the Adaptation Fund, under the authority and guidance of the CMP. The AFB is fully accountable to the CMP, which decides on the overall policies of the Adaptation Fund.

3.2.7 The Paris Agreement

The Paris Agreement is adopted under the UNFCCC as a related legal instrument to enhance the implementation of the Convention and strengthen the global response to the threat of climate change. The Agreement is legally binding treaty under the Vienna Convention on the Law of Treaties (VCLT); which denotes that, ratifying countries will be legally bound by its terms when it comes into effect. Moreover, the Agreement allows no reservations and provides that after ratification Parties will remain bound unless and until they withdraw. The Agreement made no reference to annex-based differentiation approach and will be applicable to all its parties, both on developed and developing country parties.

Paris Agreement establishes no top-down emission reduction targets and timetable for individual countries, but some formulate aspirational climate change goals and calls on Parties to contribute to this goal. The key goal of the Paris Agreement is to limit global temperature rise to well below 2 degrees Celsius and pursuing efforts to limit the increase to 1.5 degrees Celsius. The Paris Agreement entered into force on 4th November 2016, 30 days after the ratification of 55 countries that account for at least 55% of global emissions. As of now, 160 countries out of 197 ratified Paris Agreement. To make the Paris Agreement fully operational, a work programme is launched to develop modalities, procedures, and guidelines on a broad array of issues. The work programme is expected to be completed by 2018.

Paris Agreement architects a unique regulatory framework to achieve its long term 2/1.5 degrees Celsius temperature goals. On mitigation issue, the Agreement adopted a bottom-up approach which refers to a sharp contrast Kyoto Protocol. Under this regulatory framework for mitigation issue, it is the State parties who will decide nationally through their Nationally Determined Contributions (NDC) how much and in what ways they will contribute to endeavor the global goals. The respective NDCs of each country will reflect the country's national target, pledges, timeframe and mitigation paths, and action plans. Parties will design their NDCs under the light of Common but Differentiate Responsibility and Respective Capacity and national circumstance. To facilitate mitigation action and support sustainable development, the Agreement also set forth market- and non-market-based approaches.

However, the Agreement expects that each Party's NDCs will represent a progression beyond the Party's current NDCs and reflect its highest possible ambition. Parties required to submit their first NDCs prior to or at the time of submitting ratification instrument of the Paris Agreement and then onwards parties have legally binding obligations to prepare, undertake, maintain, communicate their respective NDC targets. The Agreement also expects from parties to scale up NDCs targets over time. Parties have legally binding obligation to communicate their NDCs with the necessary information for 'clarity, transparency, and understanding' in every five years and 'be informed by the outcomes of the global stock take'. Each party also mandatorily required to provide necessary information 'to track progress made in implementing and achieving its NDCs under Article 4'. Each state's submitted report on NDCs shall be mandatorily reviewed by the technical expert team under the transparency framework. However, the transparency framework will function in 'facilitative, non-intrusive, non-punitive manner, respectful of national sovereignty and avoid placing an undue burden on Parties'.

Moreover, to ensure the achievement of overall goals of the Agreement and to secure effective implementation of the NDC, the Agreement set forth top-down rigorous oversight with compliance mechanism and global-stock. To assess collective progress toward meeting the goal of the Agreement global-stock is established which will take place in 2023 and every 5 years thereafter. Its outcomes will inform Parties to updating and enhancing their actions and support and enhancing international cooperation. The functioning of the compliance mechanism is yet to be developed, however, the mechanism will function in a manner that is transparent, non-adversarial and non-punitive.

The Paris Agreement establishes a global goal on adaptation – of enhancing adaptive capacity, strengthening resilience and reduction of vulnerability to climate change. It aims to significantly strengthen national adaptation efforts, including through support and international cooperation. It also recognizes that adaptation is a global challenge faced by all. All Parties should engage in adaptation planning and are expected to submit and periodically update an adaptation communication on their priorities, implementation and support needs, plans and actions. Developing country Parties will receive enhanced support for adaptation actions. Loss and damage (Art. 8) – The Paris Agreement significantly enhances the Warsaw International Mechanism on Loss and Damage, which will develop approaches to help vulnerable countries cope with the adverse effects of climate change, including extreme weather events and slow-onset events such as sea-level rise. The Agreement provides a framework for Parties to enhance understanding, action, and support about loss and damage.

Finance, technology and capacity-building support (Art. 9, 10 and 11) – The Paris Agreement reaffirms the obligations of developed countries to support the efforts of developing country Parties to build clean, climate-resilient futures, while for the first time encouraging voluntary contributions by other Parties. Provision of resources should also aim to achieve a balance between adaptation and mitigation. In addition to reporting on finance already provided, developed country Parties commit to submitting indicative information on future support every two years, including projected levels of public finance. The agreement also provides that the Financial Mechanism of the Convention, including the Green Climate Fund, shall serve the Agreement. International cooperation on climate-safe technology development and transfer and building capacity in the developing world are also strengthened: a technology framework is established under the Agreement and capacity-building activities will be strengthened through, inter alia, enhanced support for capacity building actions in developing country Parties and appropriate institutional arrangements. Climate Change education, training, public awareness, public participation and public access to information (Art 12) is also to be enhanced under the Agreement.

Box 10: Essential Elements of the Paris Agreement

- *Long-term temperature goal* (Art. 2) – The Paris Agreement, in seeking to strengthen the global response to climate change, reaffirms the goal of limiting global temperature increase to well below 2 degrees Celsius, while pursuing efforts to limit the increase to 1.5 degrees.
- *Global peaking* (Art. 4) –To achieve this temperature goal, Parties aim to reach global peaking of greenhouse gas emissions (GHGs) as soon as possible, recognizing peaking will take longer for developing country Parties, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of GHGs in the second half of the century.
- *Mitigation* (Art. 4) – The Paris Agreement establishes binding commitments by all Parties to prepare, communicate and maintain a nationally determined contribution (NDC) and to pursue domestic measures to achieve them. It also prescribes that Parties shall communicate their NDCs every 5 years and provide information necessary for clarity and transparency. To set a firm foundation for higher ambition, each successive NDC will represent a progression beyond the previous one and reflect the highest possible ambition. Developed countries should continue to take the lead by undertaking absolute economy-wide reduction targets, while developing countries should continue enhancing their mitigation efforts, and are encouraged to move toward economy-wide targets over time in the light of different national circumstances.
- *Sinks and reservoirs* (Art.5) –The Paris Agreement also encourages Parties to conserve and enhance, as appropriate, sinks and reservoirs of GHGs as referred to in Article 4, paragraph 1(d) of the Convention, including forests.

- *Voluntary cooperation/Market-and non-market-based approaches* (Art. 6) – The Paris Agreement recognizes the possibility of voluntary cooperation among Parties to allow for higher ambition and sets out principles – including environmental integrity, transparency and robust accounting – for any cooperation that involves internationally transferal of mitigation outcomes. It establishes a mechanism to contribute to the mitigation of GHG emissions and defines a framework for non-market approaches to sustainable development.
- *Adaptation* (Art. 7) – The Paris Agreement establishes a global goal on adaptation – of enhancing adaptive capacity, strengthening resilience and reduction of vulnerability to climate change. It aims to significantly strengthen national adaptation efforts, including through support and international cooperation. It also recognizes that adaptation is a global challenge faced by all. All Parties should engage in adaptation planning and are expected to submit and periodically update an adaptation communication on their priorities, implementation and support needs, plans and actions. Developing country Parties will receive enhanced support for adaptation actions.
- *Loss and damage* (Art. 8) – The Paris Agreement significantly enhances the Warsaw International Mechanism on Loss and Damage, which will develop approaches to help vulnerable countries cope with the adverse effects of climate change, including extreme weather events and slow-onset events such as sea-level rise. The Agreement provides a framework for Parties to enhance understanding, action and support with regard to loss and damage.
- *Finance, technology and capacity-building support* (Art. 9, 10 and 11) – The Paris Agreement reaffirms the obligations of developed countries to support the efforts of developing country Parties to build clean, climate-resilient futures, while for the first time encouraging voluntary contributions by other Parties. Provision of resources should also aim to achieve a balance between adaptation and mitigation. In addition to reporting on finance already provided, developed country Parties commit to submit indicative information on future support every two years, including projected levels of public finance. The agreement also provides that the Financial Mechanism of the Convention, including the Green Climate Fund (GCF), shall serve the Agreement. International cooperation on climate-safe technology development and transfer and building capacity in the developing world are also strengthened: a technology framework is established under the Agreement and capacity-building activities will be strengthened through, inter alia, enhanced support for capacity building actions in developing country Parties and appropriate institutional arrangements.
- *Climate change education, training, public awareness, public participation and public access to information* (Art 12) is also to be enhanced under the Agreement.
- *Transparency* (Art. 13)*, implementation and compliance* (Art. 15) – The Paris Agreement relies on a robust transparency and accounting system to provide clarity on action and support by Parties, with flexibility for their differing capabilities of Parties. In addition to reporting information on mitigation, adaptation and support, the Agreement requires that the information submitted by each Party undergoes international review. The Agreement also includes a mechanism that will facilitate implementation and promote compliance in a non-adversarial and non-punitive manner and will report annually to the CMA.
- *Global Stock take* (Art. 14) – A "global stock take", to take place in 2023 and every 5 years thereafter, will assess collective progress toward meeting the purpose of the Agreement in a comprehensive and facilitative manner. Its outcomes will inform Parties in updating and enhancing their actions and support and enhancing international cooperation. For 2018 a facilitative dialogue is envisaged to take stock of collective progress towards the long-term emission reduction goal of Art 4.
- *Decision 1/CP.21* also sets out a number of measures to enhance action prior to 2020, including strengthening the technical examination process, enhancement of provision of urgent finance, technology and support and measures to strengthen high-level engagement. (Source: UNFCCC)

No of Parties ratified: 185 Parties as of February 2019.

3.2.8 Major Thematic Areas Dealing Climate Change

Adaptation

The Convention refers to adaptation in several articles. First, the ultimate objective of the Convention is to stabilize "greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner" (Article 2). In their commitments under Article 4.1(b) of the Convention, all Parties are to "formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to facilitate adequate adaptation to climate change". In the same way as for all the provisions of Article 4.1, this is subject to "common but differentiated responsibilities and specific national and regional development priorities, objectives and circumstances" of all Parties. Article 4.1(e) calls on Parties to "cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods".

Article 4.1(f) requires Parties to "take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions". It also calls on Parties to "employ appropriate methods, for example impact assessments, formulated and determined nationally", with a view to minimizing adverse effects that adaptation projects or measures could have on the economy, on public health or on the quality of the environment.

Article 4.4 requires Annex II Parties to "assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects". Article 4.8 of the Convention calls on Parties to give full consideration, in implementing their commitments, to "what actions are necessary under the Convention, including actions related to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing country. Parties arising from the adverse effects of climate change and/or the impact of the implementation of response measures". It also lists categories of countries that may be particularly affected. Article 4.9 further requires Parties "to take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology".

Nairobi Work Programme

The Nairobi work programme disseminates knowledge and information on adaptation as widely as possible through a variety of knowledge products and publications. Expected Outcomes are as below:

- Enhanced capacity at international, regional, national, sectoral and local level
- Improved information and advice to the Conference of the Parties (COP) of the UNFCCC
- Enhanced dissemination and use of knowledge from practical adaptation activities
- Enhanced cooperation among parties, relevant organizations, business, civil society and decision makers
- Enhanced contribution of adaptation action to sustainable development

National Adaptation Programmes of Action (NAPAs)

NAPAs are country-driven processes to identify activities that respond to urgent and immediate needs of Least Developed Countries (LDCs) to reduce their vulnerability. Steps include: Information synthesis, Assessment of vulnerability and potential risk areas, Identification of key priority adaptation measures. Objectives of the NAP process:

- To reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience
- To facilitate the integration of climate change adaptation into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels.

Cancun Adaptation Framework (CAF)

Enhance action on adaptation, including through international cooperation and coherent consideration of matters relating to adaptation under the Convention. Five CAF Clusters:

a. Implementation
b. Support
c. Institutions
d. Principales and
e. Stakeholder engagement.

Loss & Damage (L&D)

The L&D resulting from adverse impacts of climate change is now a reality. In the absence of inadequate efforts of mitigation and adaptation, the adverse impacts of climate change are causing harm to the lives and livelihoods of millions of people all over the world and inflicting significant economic and noneconomic losses and damages, particularly in developing countries. Even in line with the commitment of the Paris Agreement, the efforts of the global community can limit warming to 1.5^{o}C, vulnerable community would face loss and damage resulting from climate change due to lack of ability to adapt with all sorts of climatic impacts.

Despite the growing importance of Loss and Damage in the global discourse on climate change there still exists no agreed definition. Some of the views on Loss and Damage as follows:

- Loss and damage have been defined as the actual and/or potential manifestation of impacts associated with current climate and future climate change that negatively affect human and natural systems.
- Loss and damage can be economic and non-economic. Economic loss and damage are accounted for informal accounting procedures (such as loss of infrastructure or income) while non-economic loss and damage (NELD) are not accounted for informal accounting procedures.
- NELD can be incurred by individuals and households, societies and communities and the environment. Examples include loss of culture, health, territory, biodiversity and ecosystem services, loss of sovereignty and even loss of human life.
- Therefore, climate change-induced loss and damage have imposed additional challenges for the global community, to develop an appropriate mechanism to deal with such losses and damages related to life and livelihood, property, environment and ecology, values, culture, heritage, and territory. Initially, conceptualization and identification of the nature of losses and damages associated with climate change impacts is needed for ascertaining appropriate approaches to address such losses and damages and to institutionalize such policy approaches. The complex nature and the different contexts of loss and damage associated with climate change impacts require appropriate assessment tools and methodologies for conceptualization and identification of such losses and damages.

Warsaw International Mechanism (WIM) for Loss and Damage

The Loss and Damage Work Programme was established under UNFCCC in 2010 and consequently, the Warsaw International Mechanism (WIM) for loss and damage was established in 2013. An Executive Committee of the WIM is established to guide the implementation of functions of WIM identified of COP 18 decision under the guidance of and accountable to the COP.

The Executive Committee of the WIM is mandated initially to implement the two-year work plan on nine identified priority areas, and to develop a five-year rolling work plan (as part of the two-year work plan), It is also mandated to initiate work related to the establishment of a clearinghouse for risk transfer and a task force for displacement (Decisions of COP 20 & COP 21). Moreover, the ExCom of the WIM developed Terms of Reference (ToR) for a technical expert group to provide technical support and guidance on comprehensive risk management and transformational approaches. The ExCom of the WIM also established the Expert Group on non-economic loss and damage with a view to developing inputs and recommendations to enhance data on and knowledge of reducing the risk of and addressing non-economic loss and damage, including how to factor these into the planning and elaboration of measures to address loss and damage.

However, the WIM established under the Cancun Adaptation Framework, was subject to review including its structure, mandate, and effectiveness at COP22. As such, Parties of the Convention considered the evolution of structures and functions of the WIM and agreed at COP 22 to review of the mandate, structure, and effectiveness of WIM periodically. It is agreed further that; the first review of the WIM will be held in 2019. Parties of the Convention realized the need for adequate resources and capacities to deal with loss and damage resulting from climate impacts. Hence, COP requested the secretariat to prepare a technical paper on existing financial mechanisms and their modalities within and outside the convention for addressing loss and damage, as to facilitate 2019 review.

Parties of the Convention also approved the indicative framework for the five-year rolling work plan of the Executive Committee at COP 22 and suggested to initiate relevant work at the first meeting of the Executive Committee in 2017. Some of the corresponding activities for the five-year rolling work plan agreed to include advancing the operationalization of the mandates relating to a clearinghouse on risk transfer and a task force on displacement and enhancing action and support, including finance, technology, and capacity-building, to address loss and damage. COP 22 decision also invited submissions from Parties and relevant organizations on possible activities under each strategic workstream of the indicative framework for the five-year rolling work plan.

The Warsaw International Mechanism (WIM) for Loss and Damage associated with Climate Change Impacts is anchored in the agreement (Article 8.1).

- Agreed to enhance understanding, action, and support, including through the Warsaw International Mechanism, as appropriate, on a cooperative and facilitative basis with respect to loss and damage associated with the adverse effects of climate change (8.3)
- Agreed on the areas of cooperation and facilitation to enhance understanding, action, and support may include (Art. 8.4):
    a. Early warning systems;
    b. Emergency preparedness;
    c. Slow onset events;
    d. Events that may involve irreversible and permanent loss and damage;
    e. Comprehensive risk assessment and management;
    f. Risk insurance facilities, climate risk pooling, and other insurance solutions;
    g. Non-economic losses;
    h. Resilience of communities, livelihoods, and ecosystems

Adaptation under the Paris Agreement

The Agreement establishes a notional and aspirational "global goal on adaptation" to enhance adaptive capacity, strengthen resilience and reduce vulnerability to climate change (Article 7.1). Adaptation is recognized as a key component of the long-term global response to climate change and an urgent need of developing country Parties (Article 7.2). The importance of continuous and enhanced support for their adaptation efforts is also recognized (Articles 7.6 and 7.13), for Parties that are particularly vulnerable to the adverse effects of climate change (Articles 7.2 and 7.6).

Adaptation action should follow a country-driven, gender-responsive, participatory and transparent approach that considers the interests of vulnerable groups, communities and ecosystems (Article 7.5). Adaptation action should be based on and guided by "the best available science and, as appropriate, traditional knowledge, knowledge of indigenous peoples and local knowledge systems, with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions, where appropriate" (Article 7.5). Parties should also collectively strengthen cooperation on adaptation action, taking into account the Cancun Adaptation Framework, including through information sharing, strengthening institutional arrangements, assisting developing country Parties in assessing needs and improving the effectiveness and durability of actions (Article 7.7). Individually, each Party is required, as appropriate, to engage in adaptation planning processes and the implementation of actions, plans and policies such as, for example, formulating national adaptation plans (NAPs), assessing climate change impacts and vulnerability, and building resilience.

Adaptation Communication

Parties should submit an adaptation communication on adaptation priorities, needs, plans and actions (Article 7.10). This communication must be submitted and updated periodically, as appropriate, as a component of, or in conjunction with, other communications such as NAPs, NDCs or national communications (Article 7.11). As similar as the mitigation NDCs, adaptation communications will be housed in a public registry maintained by the UNFCCC Secretariat (Article 7.12).

Articles 7.9 to 7.12 reflect formal, procedural commitments by Parties on adaptation (to engage in adaptation planning, and to submit and update adaptation communications). However, these commitments are qualified by "shall, as appropriate" and "should" and are, therefore, of limited binding nature. The Agreement further emphasizes that these communications should not create any additional burden for developing country Parties (Article 7.10). Modalities on how adaptation efforts by developing country Parties will be recognized will be adopted at CMA 1 (Article7.3).

Adaptation and the Global Stock take

Adaptation is part of the Article 14 global stock take, which will: recognize adaptation efforts of developing countries; enhance the implementation of adaptation action; review the adequacy and effectiveness of adaptation and support provided; and review overall progress in achieving the global adaptation goal (Article 7.14).

Adaptation Support

To prepare for the application of the Agreement, the adopting decision tasks the Adaptation Committee and the Least Developed Countries Expert Group (LEG) with jointly developing methodologies and making recommendations on facilitating the mobilization of support; and reviewing the adequacy and effectiveness of adaptation and support, in connection with the global stocktake. In addition, the Adaptation Committee will review the work of adaptation related institutional arrangements under the UNFCCC to identify ways to enhance coherence and consider methodologies to assess adaptation needs.

The Green Climate Fund (GCF) is asked to expedite support for LDCs and other developing country Parties for formulating NAPs and their subsequent implementation. Relevant UN agencies and other financial institutions are also invited to provide information on how their development assistance and climate finance programmes incorporate climate-proofing and climate resilience measures. Elements related to adaptation finance are also included in Article 9, on finance, and discussed later in this Guide. The adopting decision further requests Parties to strengthen regional cooperation on adaptation and to establish regional centers and networks.

Adaptation Cost: The cost between 2010 and 2050 of adapting to an approximately 2o C warmer world by 2050 is in the range of $75 billion to $100 billion a year while for South Asia alone is in the range of $12 billion to $19.4 billion (World Bank, 2010).

Mitigation

To prevent dangerous *anthropogenic* interference with the *climate* system, actions need to be taken to stabilize greenhouse gas concentrations in the *atmosphere*. Such actions are referred to as "climate change mitigation". More specifically, mitigation involves:

- Reducing GHG emissions, e.g. by making older equipment more energy efficient;
- Preventing new GHG emissions to be released in the atmosphere, e.g. by avoiding the construction of new emission-intensive factories;
- Preserving and enhancing sinks and reservoirs of GHGs, e.g. by protecting natural carbon sinks like forests and oceans or creating new sinks ("carbon sequestration").

Key Concepts related to Mitigation

- Mitigation refers to efforts to reduce/prevent emission of greenhouse gases (GHGs) or to enhance their removal from the atmosphere by sinks (UNEP, 2009).
- Mitigation Option: A technology, practice, or policy that reduces or limits emissions of GHGs or increases their sequestration
- Low-carbon/emission Development: Low carbon development refers to economic development with minimal output of GHG emissions
- Green Economy: An economy that results in "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities".
- Historical Responsibility: the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs (Preamble of UNFCCC, 1992).
- Article 2 of UNFCCC: The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

Commitments of Annex I Parties

According to Article 4.2(a), each Annex I Party "shall adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs". The article further states that "the return by the end of the present decade [i.e. the 1990s] to earlier levels" of anthropogenic GHG emissions would contribute to modifying longer-term trends in these emissions consistent with the objective of the Convention, an undertaking in which Annex I Parties are called upon to take the lead.

Article 4.2(b) stipulates that Annex I Parties "shall communicate detailed information" on their policies and measures that aim to return their GHG emissions individually or jointly to their 1990 levels. Taken together, these provisions have been interpreted to add up to the non-legally binding aim of returning GHG emissions of Annex I Parties to their 1990 levels by the year 2000. The information mentioned in Article 4.2(b) is to be communicated by the Party "within six months of the entry into force of the Convention" and "periodically thereafter" in the context of the national communications further defined by Article 12.

Communications have also to provide estimates of the effects which the policies and measures will have on anthropogenic GHG emissions by sources and removals by sinks. These communications are to be submitted "during the period referred to in Article 4, paragraph 2(a)" i.e. by the end of the 1990s. Subsequent guidance by the COP has provided for Parties submitting estimates for later years too. The secretariat, in its last compilation and synthesis report of Annex I Parties' third national communications43, noted that Parties had reported policies and measures which covered all the important sources of emissions much more comprehensively than previously. There was a clear indication of a shift towards implementing new climate-specific policies and measures, such as emissions trading, carbon taxes, and green certificate trading. The greatest number of policies and measures reported were in the energy sector.

Annex I Parties that are also Parties to the Protocol agreed to be legally bound by specific commitments on GHG limitation or reduction. The reduction, or limitation, objectives of these Parties are listed in Annex B of the Protocol. The reductions envisaged are calculated to add up to a total of at least 5 percent below baseline levels for the group, the normal base year being 1990 (with provisions for flexibility for EITs and certain types of gases). The limitation and reduction objectives are not targeted at a single year but are calculated as the mean of reductions logged over a five-year commitment period from 2008 to 2012.

The maximum amount of CO_2 emissions units (or the equivalent of such units in the case of other GHGs) that a Party may emit during the commitment period, if it is to fully comply with its emissions target, is referred to as its assigned amount. The Protocol provides for comprehensive inclusion of GHGs and sources. For GHGs, rather than providing values for individual gases, reduction/ limitation objectives refer to a basket of four gases (carbon dioxide, methane, nitrous oxide, Sulphur hexafluoride) and two groups of gases (hydrofluorocarbons and perfluorocarbons), listed in Annex A of the Protocol. Annex A also contains a list of sectors and source categories. Removals of GHGs by sinks can be counted towards a country's commitments, subject to certain conditions.

Although each Party listed in Annex B has its individual reduction or limitation commitment, the Protocol contains a range of provisions for flexibility. Parties may form a group whose emissions are counted together rather than individually for each Party, an approach chosen by the European Union. Furthermore, the Protocol introduces three flexibility mechanisms allowing countries to achieve a proportion of their commitments by earning credits for GHG emissions avoided or GHG removals achieved in other countries. The Protocol also requires the COP/MOP to approve procedures and mechanisms relating to compliance at 1st session.

The Kyoto Protocol entered into force on 16 February 2005. It includes provisions for reviewing commitments so that they can be strengthened over time. It states that negotiations on targets for the second commitment period are to start in 2005, by which time Annex I Parties which are Parties to the Protocol should have made demonstrable progress in meeting their commitments. Accordingly, COP/MOP 1 decided to initiate a process to consider further commitments by Annex I Parties for the period beyond 2012. An ad hoc working group of Parties to the Protocol was established to conduct the work and report at each session of the COP/MOP (decision1/CMP.1). The group was requested to complete its task so as to avoid any gap between the first and second commitment period.

Box 11: Commitments of All Parties for Mitigation under UNFCCC

Article 3.3 stipulates that Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. In order to ensure global benefits at the least possible cost, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of GHGs and adaptation and comprise all economic sectors. In addition, they may be carried out cooperatively by interested Parties.

Article 4.1. The article is premised on the need to take into account Parties' "common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances". Article 4.2(a) also calls for differentiation among the Annex I Parties, stating that account should be taken of "the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances.

Article 4.1(b) calls on all Parties to "formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol".

Article 4.1(d) calls on Parties to "promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems".

Article 4.1(f) requires Parties to "take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions". It also calls on Parties to "employ appropriate methods, for example impact assessments, formulated and determined nationally", with a view to minimizing adverse effects that projects or measures undertaken in the context of mitigation could have "on the economy, on public health or on the quality of the environment".

Article 4.1(h) requires Parties to promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and CC, and to the economic and social consequences of various response strategies.

Article 4.7 requires that to the extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and technology transfer of and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties. (UNFCCC, 1992)

Mitigation in the Paris Agreement

Long-Term Temperature Goal: The long-term temperature goal includes two targets for maximum global warming. Parties to the Agreement will commit to "[hold] the increase in the global average temperature to well below 2°C above pre-industrial levels", and "to pursue efforts" to limit the temperature increase to 1.5°C. To date, the 2°C target has been the working assumption for most nations in their mitigation efforts, including the planning and preparation of intended nationally determined contributions (INDCs) before Paris. The 1.5°C target was included as the result of a concerted push by an alliance of vulnerable States, including the LDCs, SIDS and the Independent considered an aspirational goal by some States.

Nationally Determined Contributions (NDCs): In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty (Art. 4.1)

All Parties are expected to communicate NDCs (Article 4.2) in every 05 years (Article 4.9) and put in place domestic mitigation measures to achieve, taking into account the global stock take (Article 4.9) and reflecting CBDRRC in light of different national circumstances (Article 4.3).

The main obligation of Parties under the Agreement, therefore, is procedural in nature. There are no substantive criteria for NDCs at this stage, and they do not create from legally binding obligations between States. The phrase "pursue domestic mitigation measures" (Article 4.2) could be interpreted as an additional substantive obligation. However, without further specifications, it hardly goes beyond the general requirement under international law that Parties have to execute a treaty in good faith (for instance, by not obstructing its purpose and meeting reasonable expectations of other Parties). Moreover, whether NDCs encapsulate commitments that are binding on government entities under domestic law is a matter of national and supranational law.

While developed countries are expected to continue to apply economy-wide emission caps, developing countries are encouraged to move towards them over time (Article 4.4), and are entitled to receive support for their mitigation actions (Article 4.5). NDCs should be clear and transparent (Article 4.8), in accordance with guidance from the CMA (Article 4.13), while considering existing methods and guidance under the UNFCCC (Article 4.14). They will be recorded in a public registry maintained by the UNFCCC Secretariat (Article 4.12), which will also serve as the Secretariat to the Agreement. The CMA will consider the issue of common time frames for NDCs at its first session (Article 4.10). However, a Party can adjust its existing NDC at any time to enhance its level of ambition (Article 4.11). Successive NDCs have to reflect a Party's highest possible ambition and be progressively more ambitious over time (Article 4.3).

Parties, including regional economic integration organizations and their member States, can act jointly but must notify the Secretariat of the emission levels allocated to each Party within the relevant time, when they communicate their NDCs (Article 4.16), with each Party ultimately responsible for its allocated emission levels (Article 4.17). In the case of joint action taken by the EU Member States, each Member State individually and the EU as a whole, as a Party to the Agreement, will be responsible for the allocated emission level (Article 4.18).

Low Emission Development Strategies: Article 4.19 calls on all Parties, including LDCs and SIDS (Article 4.6), to strive to formulate and communicate Low Emission Development Strategies (LEDS). The adopting decision calls for LEDS to be submitted by 2020, and to include mid-century, long-term strategies, which will be published on the UNFCCC website (§35). Mitigation co-benefits resulting from adaptation actions or economic diversification efforts can count towards mitigation contributions (Article 4.7).

Greenhouse Gas Sinks and Reservoirs and REDD+: Article 5.1 calls on Parties to act to conserve and enhance

biomass, forest, oceanic and other greenhouse gas sinks and reservoirs. They are encouraged to implement and support the framework already set out in existing UNFCCC guidance and decisions for: policy approaches and positive incentives to reduce emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest stocks in developing countries (REDD+); and alternative policy approaches, such as joint mitigation and adaptation, while incentivizing non-carbon benefits associated with such approaches (Article 5.2). Parties that promoted the creation of a new mechanism on forests failed in Paris. As a result, the provision does not contain an express reference to the Warsaw Framework on REDD+, and it seems unlikely that any other institutional arrangements on forests will be established soon.

Finance

What is Climate Finance: There is no standard definition of climate finance. In fact, there are many differing views on what type of funding constitutes climate finance. In its broadest interpretation, climate finance refers to the flow of funds towards activities that reduce greenhouse gas emissions or help society adapt to climate change impacts. However, the term is most frequently used in the context of international climate change negotiations, where climate finance or international climate finance is used to describe financial flows from developed to developing countries for climate change mitigation/adaptation activities. In the context of political negotiations, climate finance has been defined even more narrowly as "new and additional" funding. Under this definition, only those financial commitments by developed countries that represent investments beyond usual development aid qualify as climate finance (WRI, 2013).

- No internationally agreed definition
- Often understood as "new and additional" public financial assistance for developing countries
- Other financing sources, such as foreign direct investments and regular budgetary expenditures, are also included (CDKN, 2017).

According to the UNFCCC Standing Committee on Finance:

"Climate Finance aims at reducing emissions and enhancing sinks of greenhouse gases and aims at reducing the vulnerability of, and maintaining and increasing the resilience of, human and ecological systems to negative climate change impacts."

Global Environmental Facility (GEF): To facilitate the transfer of funds to developing countries, the UNFCCC established a financial mechanism operated by the Global Environmental Facility (GEF). Parties steer the operations of the financial mechanism through the Conference of the Parties (COP) by deciding on important aspects such as "climate change policies, programme priorities and criteria for eligibility of funding." At COP 16 in 2010 Parties decided to establish a Standing Committee on Finance to assist the COP in exercising its functions (UNDP, 2011).

GEF Administered Trust Funds: The GEF is responsible for the administration of three trust funds; the GEF Trust Fund, the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF). The GEF also provides secretarial services to the Adaptation Fund (AF) on an interim basis. Every four years the GEF Trust Fund gets replenished by donor pledges made over a four-year period. A total of USD 15 billion has been received during five replenishments and funding is made available for activities falling within the GEF Focal Areas that are defined during the replenishment discussions.

Special Climate Change Fund (SCCF): supports adaptation and technology transfer in all developing country parties to the UNFCCC, supporting both long-term and short-term adaptation activities in water resources management, land management, agriculture, health, infrastructure development, fragile ecosystems, including mountainous ecosystems, and integrated coastal zone management.

Least Developed Countries Fund (LDCF): aims to address the needs of the 48 LDCs which are particularly

vulnerable to the adverse impacts of climate change. As a priority, the LDCF supports the preparation and the implementation of the National Adaptation Programs of Action (NAPAs), which are country-driven strategies that identify the immediate needs of LDCs in order to adapt to climate change. All the Least Developed Countries are eligible to get access of this fund.

Adaptation Fund (AF): The Adaptation Fund was first created by the 7th session of the Conference of Parties (COP 7) in 2001 through decisions made in Marrakech, Morocco, although it was not launched until being operationalized and its Board established in follow-up decisions at COP 13 in December 2007 in Bali, Indonesia. The aim of the fund is to finance concrete adaptation projects and programmes in developing countries that are parties to the Kyoto Protocol and are particularly vulnerable to the adverse effects of climate change. The World Bank serves as the interim trustee of the fund. As of October 2017, the Adaptation Fund has committed US$ 462 million to support 73 countries, including 28 Least Developed Countries (LDCs) and 17 Small Island Developing States (SIDS). The Fund is financed in part by voluntary contributions of government and private donors, and also from a 2% share of proceeds of Certified Emission Reductions (CERs) issued under the Protocol's Clean Development Mechanism projects.

The salient feature of the Adaptation Fund is that it pioneered fully operational direct access to climate financing. Through direct access, accredited National Implementing Entities (NIEs) can access financing and manage all aspects of climate adaptation and resilience projects, from design through implementation to monitoring and evaluation. It can also be accessed through Regional Implementing Entities (RIEs) and (MIEs) (Adaptation Fund, 2015).

Green Climate Fund (GCF)[7]: The decision to establish the Green Climate Fund (GCF) was adopted in 2010, at COP 16, held in Cancun, Mexico, and it became operational in 2015. GCF seeks to promote a paradigm shift to low-emission and climate-resilient development, taking into account the needs of nations that are highly vulnerable to climate change impacts, in particular, Least Developed Countries (LDCs), Small Island Developing States (SIDS), and the African States. It aims at a 50: 50 funds allocations between adaptation and mitigation while being guided by the Convention's principles and provisions. The Fund's independent secretariat is located to Songdo, South Korea. It is governed by a Board of 24 members equally representing developed and developing countries. The Board receives guidance from the COP on priorities and eligibility criteria but has full responsibility for all funding decisions. The World Bank serves as Interim Trustee for the Fund. The Green Climate Fund works through a wide range of Accredited Entities to channel its resources to projects and programmes. They can be private or public, non-governmental, sub-national, national, regional or international if they meet the standards of the Fund. The Fund has established a direct access modality so that national and sub-national organizations can receive funding directly, rather than only via international intermediaries. Green Climate Fund's investments can be in the form of grants, loans, equity or guarantees. GCF is in its ability to engage directly with both the public and private sectors in transformational climate-sensitive investments. It engages directly with the private sector through its Private Sector Facility (PSF). As of October 2017, GCF gathered pledges worth USD 10.3 billion. These funds come from developed countries, but also from some developing countries, regions, and one city (Paris). Developing countries appoint a National Designated Authority (NDA) that acts as the interface between their government and GCF and must approve all GCF project activities within the country.

7 https://www.greenclimate.fund/

Table 8: Funds for Climate Change

Global Environment Facility (GEF)	• Proposed in 1991 • Became operational in 1994 • Responsible for administering three trust funds: GEF Trust Fund, SCCF, LDCF • Provides secretariat services to AF • Countries eligible to borrow from the World Bank or if it is an eligible recipient of UNDP technical assistance are eligible
Least Developed Countries Fund (LDCF)	• Proposed in 2001 • Became operational in 2002 • Governed by the GEF with World Bank as the trustee • Financed by voluntary contributions • All Least Developed Countries are eligible
Special Climate Change Fund (SCCF)	• Proposed in 2001 • Became operational in 2002 • Has two active windows (1) Adaptation and (2) Transfer of technologies • Governed by the GEF with World Bank as the trustee • Financed by voluntary contributions • All Non-annex I countries are eligible (except LDCs)
Green Climate Fund	• Established in 2010, at COP 16 • Became fully operational in 2015 • Aims at a 50: 50 fund allocations between adaptation and mitigation • World Bank serves as the interim Trustee • Financed mainly by the developed countries. But also some developing countries, regions and a city (Paris) contributed. • Financial instrument: grants, loans, equity or guarantees • Can be accessed through NIEs, RIEs and MIEs. • Established direct access modality.
Adaptation Fund	• Created in 2001. Launched operation in 2007. • World Bank serves as the interim trustee. • Financed by government and private donors, and from 2% share of proceeds of CERs issued under Kyoto Protocol's CDM projects. • Financial Instrument: Grants. • Can be accessed through NIEs, RIEs and MIEs. • Pioneered direct access modality.

Multilateral and Bilateral Climate Funds: Apart from the financial mechanisms set up under the UNFCCC, a multitude of development cooperation agencies, bilateral and multilateral finance institutions provide funding for climate actions in developing countries. Many development cooperation agencies have rapidly integrated climate change considerations in their regular operations (figure 21).

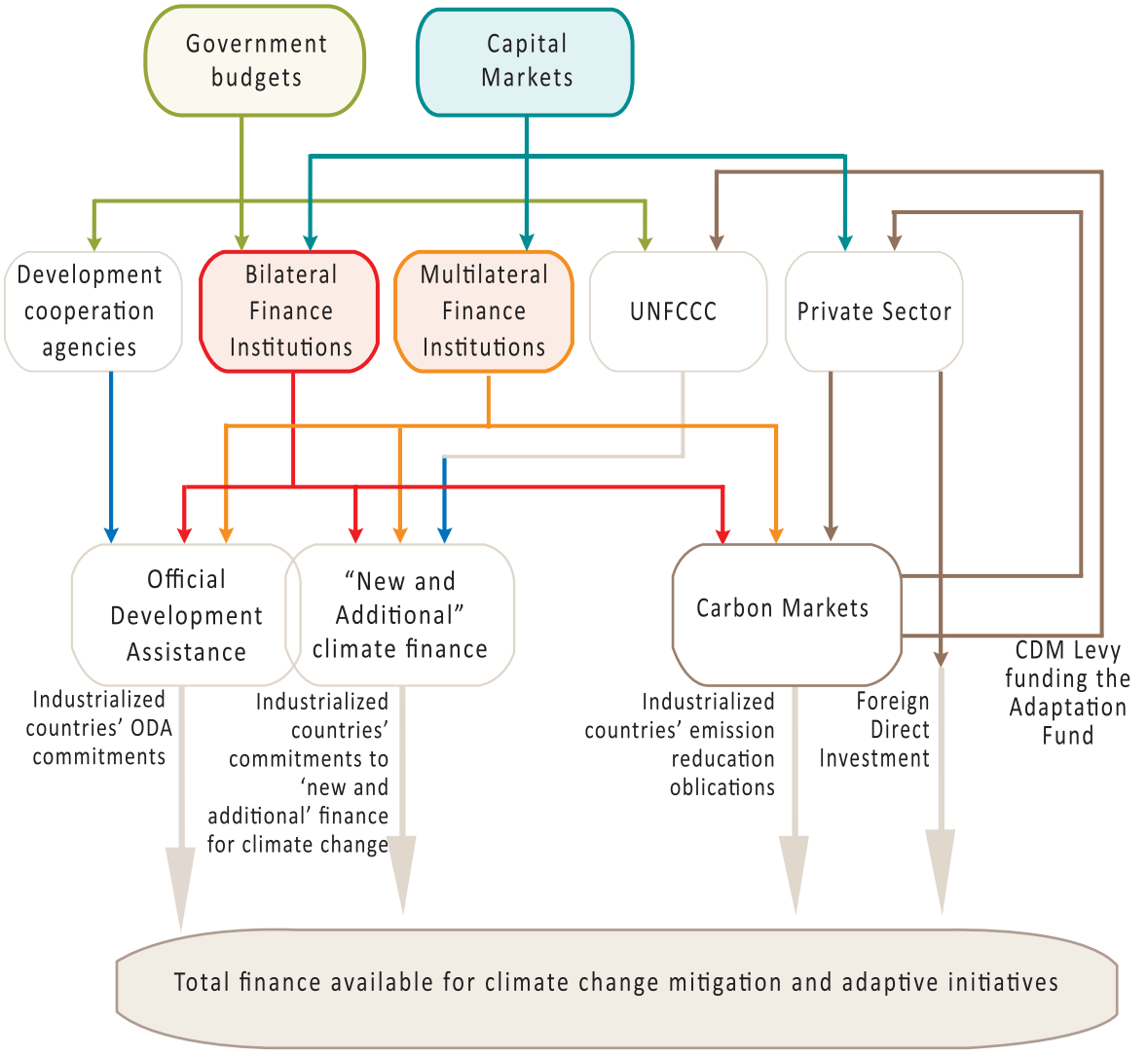


Figure 21: Different financial windows for climate change

Bilateral Finance Institutions (BFI): are financial institutions created and directed by a national government for giving aid or investing in targeted development projects and programmes in developing countries. BFI differ in mandate and purpose from development cooperation agencies, to the extent that BFIs exist as banks, with a profit as well a development objective. Examples of BFIs include the Agence Francaise de Développment (AFD), the German Development Bank (KfW), and the Japan International Cooperation Agency (JICA). The ownership of Multilateral Finance Institutions (MFIs) is shared by multiple countries. Examples include the World Bank, and regional development banks such as the Asian Development Bank, the African Development Bank etc. MFIs, such as the World Bank, have dedicated funds established for financing climate change activities (figure 22).

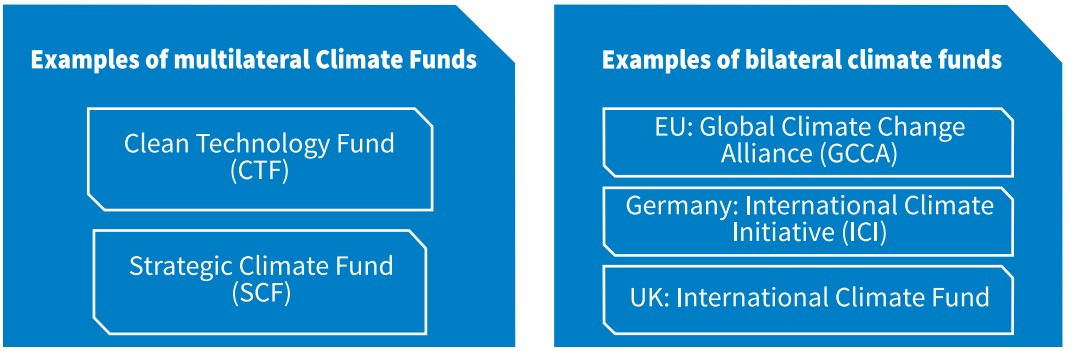


Figure 22: Multilateral and Bilateral Climate Funds (UNITAR, 2017)

Examples of multilateral sources of climate finance include the Climate Investment Funds (CIFs). The two CIF funds are the Clean Technology Fund (CTF) and the Strategic Climate Fund (SCF). The CTF finances demonstration, deployment, and transfer of low-carbon technologies for greenhouse gas (GHG) reductions in developing countries. The SCF finances targeted programmes in developing countries to pilot new climate or sectoral approaches. Both funds are implemented jointly by six Multilateral Development Banks (MDBs), with the World Bank serving as a trustee. They can provide concessional loans, grants, and guarantees, through one of the six partners MDBs, to recipients. Bilateral funding sources come from dedicated funds established by one country to support developing countries in implementing the global climate change regime (including, for example, the German International Climate Initiative and the UK International Climate Fund). Some bilateral sources can be connected to a group of countries, such as the European Global Climate Change Alliance (GCCA) which aims to develop the capacity of the poorest and most vulnerable countries to adapt to the effects of climate change (UNITAR, 2017).

The Pilot Program for Climate Resilience (PPCR) is the first targeted program of the SCF, with the objective to pilot and demonstrate ways to integrate climate risk and resilience into core development planning, while complementing existing development efforts. Building on National Adaptation Programs of Action (NAPAs) and other relevant country strategies, PPCR programs are country-led and fund technical assistance and investments to support efforts made by countries to integrate climate risk and resilience into their development planning and implementation. It also provides incentives for scaled-up action and initiatives aimed at creating a shift from "business as usual" to broad-based strategies that are aimed at achieving climate resilience at the country level. Pilot countries include Bangladesh, Bolivia, Niger, Saint Lucia, Tajikistan, Tonga, and Zambia.

Technology Development and Transfer

What is Climate Technology: According to the UNFCCC website, "A climate technology is any equipment, technique, practical knowledge or skill needed to reduce greenhouse gas emissions or adapt to climate change."

Technologies play a central role in acting on climate change. Climate technologies that help us to reduce greenhouse gas emissions include renewable energies such as wind energy, solar power, and hydropower. To help us to adapt to the adverse effects of climate change, we use climate technologies such as drought-resistant crops, early warning systems, and sea walls. There are also 'soft' climate technologies, such as energy-efficient practices and know-how to operate machinery.

Technology: International Policy Approaches

UNFCCC Technology Mechanism: Within the United Nations Framework Convention on Climate Change (UNFCCC) process, countries have confirmed the importance of enhancing the development and transfer of climate technologies to developing countries. To facilitate action in this regard, in 2010 the Conference of the Parties to the Convention established the Technology Mechanism. The Mechanism consists of two complementary bodies that work together to achieve its objective: The Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN).

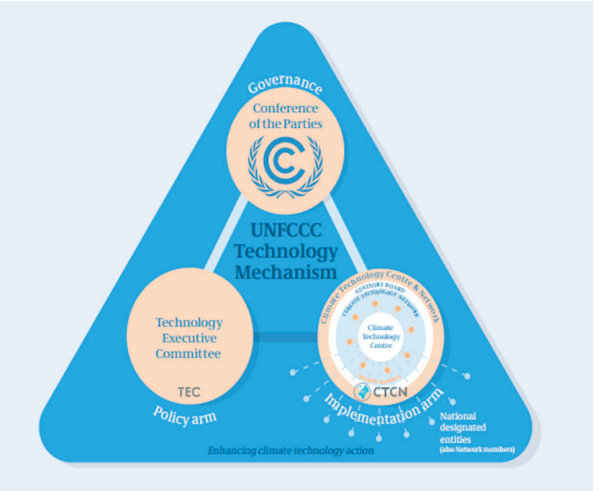


Figure 23: UNFCCC Technology Mechanism

The Technology Mechanism's two bodies, the TEC and the CTCN, work together to enhance climate technology action (figure 23). Their complementary functions support developing country efforts to address both policy and implementation aspects of climate technology development and transfer. They work to enrich coherence and synergy in the delivery of climate technology support and respond effectively to the needs of countries.

The Technology Executive Committee (TEC): is the policy arm of the UNFCCC Technology Mechanism. It consists of 20 technology experts representing both developing and developed countries. It meets several times a year and holds climate technology events that support efforts to address key technology policy issues.

One of the TEC's key outputs is its annual key messages and recommendations to the UNFCCC Conference of the Parties, through which the TEC highlights measures that countries may take to accelerate climate technology action nationally, regionally and internationally. It also produces policy briefs, called TEC Briefs, and other technical documents to inform stakeholders and catalyze climate technology efforts. Also, the TEC strengthens collaboration and cooperation on climate technology action by holding events throughout the year.

Since its inception in 2010, the TEC has undertaken work on key areas of climate technology development and transfer. These include: climate technology financing; enabling environments and barriers; national systems of innovation; research, development, and demonstration of technology; technologies for adaptation; technologies for mitigation; technology needs assessments; technology road maps; and strategic and emerging issues.

It works closely with UNFCCC entities and key technology stakeholders to catalyze climate technology action. In addition to the CTCN, the TEC engages with entities such as the Adaptation Committee, the Global Environment Facility, the Green Climate Fund and the Standing Committee on Finance. It also supports the work of the UNFCCC subsidiary bodies and ad hoc working groups. All stakeholders are invited to participate meaningfully and actively in the TEC's work. Collaboration with these actors helps the TEC to provide policy recommendations that are effective and inclusive. Following are the Functions of TEC:

- Provide an overview of countries' climate technology needs
- Analyze policy and technical issues related to climate technology development and transfer
- Recommend actions to promote climate technology development and transfer
- Recommend guidance on climate technology policies and programmes
- Promote and facilitate collaboration between climate technology stakeholders
- Recommend actions to address barriers to climate technology development and transfer
- Seek cooperation with stakeholders and promote coherence across technology activities
- Catalyze the development and use of climate technology road maps and action plans

The Climate Technology Centre and Network (CTCN): is the operational arm of the Technology Mechanism. It is hosted by the United Nations Environment Programme, in collaboration with the United Nations Industrial Development Organization, and is supported by 11 partner institutions with expertise in climate technologies. The center facilitates a network of national, regional, sectoral and international technology centers, networks, organizations, and private sector entities.

It provides free technical assistance to developing countries on climate technology issues. Developing countries may send a request to the CTCN via their nationally selected focal point, called a national designated entity (NDE). Upon receiving the request, the Climate Technology Centre quickly mobilizes its global network of experts to design and deliver a solution tailored to local needs. The CTCN provides training and support to strengthen developing country capacity to identify technology options, make technology choices and operate, maintain and adapt technologies.

Membership of the Climate Technology Network provides access to a diverse global community of climate technology users, national decision makers and financiers, under the umbrella of the Technology Mechanism. The Climate Technology Network comprises academic, civil society, finance, the private sector, public sector, and research entities, as well as over 130 CTCN national focal points (NDEs). Network members gain the opportunity to bid for the delivery of CTCN technical assistance and to showcase relevant experience, reports, and technologies (UNFCCC, 1992, Technology Mechanism).

Capacity Building

There is yet no consensus on what capacity building/development means or entails. Most of the aid agencies have defined it in their own ways (Pearson, 2011). But there appears to be a consensus that capacity building must include individuals, institutions and systems that collectively enable effective and sustainable development.

Capacity building has been a part of negotiations under the UNFCCC since its inception in 1992. Article 6 of the Convention is dedicated to promoting education, public awareness, public access to climate change information, public participation in addressing climate change, and training of scientific, technical and managerial personnel. The Article was the main basis for subsequent decisions and activities on capacity building. Similarly, Article 10 of the KP provides for the strengthening of research capacity, education, and training of personnel and institutional strengthening in developing countries.

Box 12: Article 6 of UNFCCC Education and Public Awareness

Article 6 of the Convention is dedicated to promoting education, public awareness, public access to climate change information, public participation in addressing climate change, and training of scientific, technical and managerial personnel

The capacity building activities under the UNFCCC are carried out under the capacity building framework adopted at COP 7 in 2001, as part of the Marrakech Accords. The guiding principles and approaches to this framework highlighted that capacity building should be country-driven and based on the priorities of developing countries; continuous, progressive and iterative; be undertaken in an effective, efficient, integrated and programmatic manner; take into account the special circumstances of LDCs and SIDS; promote 'learning by doing'; and rely on, and mobilize, existing national, sub-regional and regional institutions and the private sector, and build on existing processes and endogenous capacities.

Box 13: Article 10 of the Kyoto Protocol

Article 10 of the Kyoto Protocol provides for strengthening of research capacity, education and training of personnel and institutional strengthening in developing countries

In addition to this formal process, there are about 13 thematic and financial entities involved in capacity building. The thematic entities include the Adaptation Committee; Climate Technology Centre and Network (CTCN); Consultative Group of Experts; Executive Committee of the Warsaw International Mechanism for Loss and Damage; Executive Board of the Clean Development Mechanism; LDC Expert Group; Standing Committee on Finance; and the Technology Executive Committee. The financial entities include the operating entities of the Convention's financial mechanism (GEF, LDC Fund, Special Climate Change Fund, Adaptation Fund, and the Green Climate Fund or GCF). The GCF has initiated capacity building activities under its readiness programme for accessing funds. The GEF carries out capacity building in two ways: as stand-alone capacity building activities (called enabling activities); and as part of climate change projects. It is also involved in a wide range of cross-cutting capacity building activities under its core areas for improving environmental governance.

Capacity building in the Paris Agreement: Capacity building is dealt with under Article 11 of the Paris Agreement. The five paragraphs of this Article lay down the goals, guiding principles, and procedural obligations of all Parties to the Agreement regarding the capacity building. Developed country Parties should support capacity building in developing countries (Article 11.3) while developing countries should regularly communicate progress made on implementing capacity building plans, policies, actions or measures (Article 11.4).

Paris Committee on Capacity Building (PCCB): The decision adopting the Paris Agreement (1/CP.17), in paragraph 71, establishes the PCCB to address capacity gaps and needs, both current and emerging, and enhance capacity building efforts. Paragraph 74 of the adopting decision launches a work plan on capacity building for the period 2016-2020, to consider nine elements. SBI 44, in May 2016, has already agreed on a 12-member PCCB, along with a draft ToR for the committee. A review of progress by the PCCB will take place at COP 25.

The PCCB is expected to ensure coordination and coherence in the capacity building work of disparate entities. Its effectiveness will be determined, to some extent, by the quality of its membership and their experience in capacity building.

Capacity Building Initiative for Transparency (CBIT): Article 13 of the Agreement creates the CBIT. Paragraph 84 of decision 1/CP.21 stipulates that the CBIT will build the institutional and technical capacity of developing country Parties, in meeting the transparency requirements of Article 13, and also in the pre-2020 period. Article 13.15 stipulates that "support shall also be provided for the building of transparency-related capacity of developing country parties on a continuous basis".

The GEF Council meeting in June 2016 approved the establishment and programmatic directions of the CBIT Trust Fund, which has been initially capitalized with US$ 50 million (GEF 2016). GEF will prioritize projects submitted from those countries which are most in need of a capacity building for transparency-related actions, in particular, the LDCs and SIDS. Instead of a project-based approach, the funds will be best employed in building long-term sustainable mechanisms for transparency-related capacity building in countries, including through the promotion on national institutions (such as universities), in a manner that allows for national ownership of the capacity building efforts.

Finance for Capacity Building: The provision of finance for capacity building under Article 11.3 of the Paris Agreement is a recommendation (should), while the provision of support for the CBIT on a continuous basis under Article 13.14 and 13.15 is obligatory (shall). The latter does not specify any group of countries that "shall" be providing the support, however. These different formulations and omissions provide leeway for subjective interpretations by Parties in the negotiations. Also, the support provision focuses more on the transparency of action, than on support provided and received.

Transparency and Compliance

Article 13 of the Paris Agreement established an enhanced transparency framework for action and support, with built-in flexibility which considers Parties' different capacities and builds upon collective experience. The purpose of the framework for the transparency of support is to provide clarity on the support provided and received by relevant Parties for climate change actions, and, to provide a full overview of aggregate financial support provided, to inform the global stocktake.

Under the enhanced transparency framework for support, developed country and other Parties shall provide information on financial, technology transfer and capacity-building support provided to developing country Parties. Developing countries should provide information on financial, technology transfer and capacity-building support needed and received.

By communicating information on greenhouse gas (GHG) emissions and actions to reduce them, as well as on adaptation and means of implementation (such as finance, technology transfer, and capacity-building), the transparency and reporting system allows understanding ambition and progress on climate actions and support by Parties. Over the past two decades, the arrangements for national reporting of the Convention and its Kyoto Protocol have evolved into a more comprehensive measurement, reporting, and verification (MRV) framework. The reporting requirements and the timetable for the submission of national reports are different for Annex I Parties and non-Annex I Parties. The table 9 below summarizes the existing MRV arrangements for developed countries and developing countries.

Table 9: Summary of existing MRV arrangements for developed countries and developing countries

	Developed countries (Annex I Parties)	Developing countries (Non-Annex I Parties)
Reporting	Annual GHG inventory submissions Reporting requirements Submissions National communication Biennial report	National communication Biennial update report GHG inventory as part of the national communication and biennial update report
	International Assessment and Review process (IAR)	International Consultation and Analysis process (ICA)

3.2.9 Synergies with other Rio Conventions and SDGs

The Rio Conventions share a concern for many of the same environmental and sustainable development issues and operate within the same ecosystems. There are mutual dependencies and inherent relationships among the Conventions. If the Conventions can be implemented collaboratively and in a coordinated manner, synergies may result that will lead to greater progress on all fronts. For example:

- Addressing climate change can impact rates of desertification and biodiversity loss, for which climate is a key factor.
- Introducing renewable energy technologies for the reduction of greenhouse gas emissions can also reduce pressure on land and forest biodiversity by providing an alternative to unsustainable biomass fuels.
- Replanting mangrove may protect a local community against sea level rise and storm surges, while also creating new opportunities for eco-tourism and fisheries.

Underscoring the necessity of being adhered with biodiversity, land degradation and desertification, the UNFCCC drew the interlinkages within the obligations of the Convention.

> "to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. This objective is qualified in that it should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner." **(Objectives of UNFCCC 1992)**

Several decisions of COP meetings also reflected the synergies between climate change, biological diversity and land degradation and desertification in table 10.

Table 10: Several UNFCCC COP Decisions synergized between UNCBD and UNCCD

Decision 1 of COP 7 29 Oct - 10 Nov 2001 Marrakech, Morocco	The Marrakesh Ministerial Declaration The problems of poverty, land degradation, access to water and food and human health remain at the centre of global attention; therefore, the synergies between the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity, and the United Nations Convention to Combat Desertification should continue to be explored through various channels, in order to achieve sustainable development.
Decision 13/CP.8 (1) 23 Oct - 1 Nov 2002 New Delhi, India	Cooperation with other Conventions There is a need for enhanced cooperation between the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity, and the United Nations Convention to Combat Desertification, with the aim of ensuring the environmental integrity of the conventions and promoting synergies under the common objective of sustainable development, in order to avoid duplication of efforts, strengthen joint efforts and use available resources more efficiently.

Others cooperation decisions included UNFCCC follows below:

Table 11: Others Cooperation Decisions included UNFCCC

COP 5 Decision V/3 UNCBD 15 - 26 May 2000 Nairobi, Kenya	Progress report on the implementation of the programme of work on marine and coastal biological diversity To integrate fully the issue of coral bleaching in the programme of work on the conservation and sustainable use of marine and coastal biological diversity and to develop and implement a specific work plan on coral bleaching, taking into account the recommendations and in cooperation with the United Nations Framework Convention on Climate Change.
COP 5 Decision V/15 UNCBD 15 - 26 May 2000 Nairobi, Kenya	**Incentive measures** Urges Parties and other Governments to explore possible ways and means by which incentive measures promoted through the Kyoto Protocol under the United Nations Framework Convention on Climate Change can support the objectives of the Convention on Biological Diversity.
COP 6 Decision VI/15 ANNEX II UNCBD 7 - 19 April 2002 The Hague, Netherlands	**Incentive measures** Interlinkages between multilateral environmental agreements (MEAs) There is a need to examine the policies and programmes under different multilateral environmental agreements to ensure that they provide mutually reinforcing incentives. The decisions suggested attention to incentives with regard to other linkages, such as the Convention to Combat Desertification with regard to dryland biodiversity, and the United Nations Framework Convention on Climate Change with respect to land-use change and forest biodiversity. In addition, the UNFCCC is encouraged to give priority to incentives to avoid deforestation, as a substantial amount of greenhouse gas emissions is due to the destruction of forests, the greatest terrestrial repository of biodiversity.
COP 6 Decision VI/19 PROGRAMME ELEMENT 1 UNCBD 7 - 19 April 2002 The Hague, Netherlands	**Communication, education and public awareness** Towards a global communication, education and public awareness network Link the portal to other networks and websites on communication and education, for example, those of the Convention on Wetlands (Ramsar, Iran, 1971), the United Nations Framework Convention on Climate Change, etc.

COP 6 Decision VI/23 UNCBD 7 - 19 April 2002 The Hague, Netherlands	**Alien species that threaten ecosystems, habitats or species** Recognized that invasive alien species represent one of the primary threats to biodiversity, especially in geographically and evolutionary isolated ecosystems, such as small island developing States, and that risks may be increasing due to increased global trade, transport, tourism and climate change. Also Invited the United Nations Framework Convention on Climate Change to consider this matter when it considers measures for adaptation to and mitigation of climate change in particular with respect to the lifestyles of indigenous and local communities.
COP 7 Decision VII/13 UNCBD 9 - 20 February 2004 Kuala Lumpur, Malaysia	Alien species that threaten ecosystems, habitats or species (Article 8 (h)) Promote fuller consideration of issues relating to invasive alien species in other international forums, including through the joint liaison group of the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change and the United Nations Convention to Combat Desertification, and the Collaborative Partnership on Forests
COP 7 Decision VII/15 UNCBD 9 - 20 February 2004 Kuala Lumpur, Malaysia	**Biodiversity and Climate Change** Calls for where national circumstances allow case-studies on interlinkages between biodiversity and climate change following a common format developed by the joint liaison group
COP 7 Decision VII/29 UNCBD 9 - 20 February 2004 Kuala Lumpur, Malaysia	**Transfer of technology and technology cooperation** (Articles 16 to 19) Exploration of possibilities and mechanisms of cooperation with processes in other Conventions and international organizations, such as the UNFCCC Expert Group on Technology Transfer (EGTT).

Several cross-cutting priority environmental issues have been identified to respond to the global problems like climate change, loss of biodiversity and land degradation. The cross-cutting issues among UNCBD, UNFCCC and UNCCD are as follows:

- Capacity building
- Education, training and public awareness
- Technology transfer
- Information, knowledge and data management
- Undertaking research and impact assessment
- Inventories, monitoring and systematic observations
- Poverty eradication, sustainable development and environmental security
- Reporting and monitoring
- Planning, policy development and reform of legal frameworks
- Public participation
- International cooperation
- Utilization of fund within the limited resources

A coordinated approach to responding to climate change can ensure that adaptation activities have multiple benefits, including combating desertification and preventing biodiversity loss, thus catalyzing progress in achieving sustainable development goals.

Linkage of UNFCCC and SDGs

The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. It was adopted in 2015 and more than 190 world leaders committed to 17 Sustainable Development Goals (SDGs) to help us all end extreme poverty, fight inequality and injustice, and fix climate change. Sustainable Development Goal 13 is related to climate change and the following table provides an overview of SDG-13.

Box 14: Targets of Sustainable Development Goal 13 Take urgent action to combat climate change and its impacts*

13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

13.2 Integrate climate change measures into national policies, strategies and planning

13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible

13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and Small Island developing States, including focusing on women, youth and local and marginalized communities

*Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.

Topic 3.3:
Climate Change Impacts in Bangladesh: Key Sectors and Vulnerabilities

Bangladesh is a sub-tropical country located between latitudes of 22 and 27°N. It is a very low-lying country at the head of the Bay of Bengal. Most of the country consists of the swampy plains of the great delta of the Ganges and Brahmaputra rivers. Given its geographic location and features, Bangladesh is extremely vulnerable to the effects of climate change. Intergovernmental Panel on Climate Change (IPCC) noted that Bangladesh will be among the worst victim due to climate change. About 88% of the landmass consists of floodplains, sitting in a delta. The topography is flat and the majority of the landmass lies within 10 meters above mean sea level. The geographic location at the convergence of the three great rivers – the Ganges, Brahmaputra and Meghna – and near the Eastern Himalayas makes Bangladesh vulnerable to natural hazards like floods, cyclones and occasional earthquakes (Nishat and Mukherjee, 2013).

Climate Observations in Bangladesh

- Since 1960 there has been widespread warming over Bangladesh during both the hot season (March to May) and cool season (December to February).
- There has been a reduction of the number of cool nights and an increase in the number of warm nights over the period 1970-2000.
- There has been small to medium increase in total precipitation over Bangladesh since 1960 (Climate: Observations, projections and impacts: Bangladesh, 2011).

Table 12: Climate Change Impacts in Bangladesh (MoEF, 2017)

Indicators	Observed Key Impacts	Projected Key Impacts
Temperature Rise	The increasing trend of minimum temperature by 0.45˚C during the winter and 0.52˚C during the monsoon seasons have been observed over the period from 1948 to 2008. The maximum temperatures were also observed to increase by 0.87 ˚C during the pre-monsoon and by 0.42˚C post-monsoon month.	Estimated rise in temperature an average of 1.6°C by the 2050.
Rainfall Increase	Over the period from 1948 to 2008, the increasing trend of rainfall has been observed in post monsoon in many parts of the country.	Aggregate precipitation will increase by 8% with respect to current averages by 2050.
Sea Level Rise	Sea level rise had also shown an increasing trend over the period from 1947 to 2003. At the southeast of Bangladesh, sea level rose about 1.4 mm/year, and in the south-central part nearest to the sea upto 3.9 mm/year increase was observed.	Anticipated sea levels rise in the coastline of the Bay of Bengal to 27 cm by 2050. Due to the rise in the average sea level, an additional 14% of the country may be extremely vulnerable to floods by 2030 (MoP, 2015).

Sectoral Impacts

Impacts on Crop Agriculture

- The Geophysical Fluid Dynamics Laboratory (GFDL) model of a study predicted an approximate 17% decline in overall rice production for Bangladesh and as high as a 61% decline in wheat production under a 4oC change in temperature, which is the most predictable change envisaged by the scientists and experts of climate change for Bangladesh.
- Agriculture accounts for only 15% of GDP, over 60% of people depend on agriculture directly or indirectly for their livelihoods. The higher temperatures and changing rainfall patterns, coupled with increased flooding, rising salinity in the coastal belt and droughts are likely to reduce crop yields and crop production. IPCC estimates that, by 2050, rice production in Bangladesh could decline by 8% and wheat by 32% (against the base year of 1990) (MoEF, 2017).
- Climate Change, sea level rise and intrusion of salinity can increase the loss of agricultural lands and food insecurity in the coastal region. Rising sea-level will permanently inundate vast agricultural land, making it unsuitable for crop agriculture. Salinity intrusion could progress further inland in the future than now through tidal inflow increasing soil salinity seasonally or permanently. The food security of this region will be threatened as the total cultivable land would be less than that of present time and soil and water quality decline will also reduce crop productivity. Increased salinity alone from a 30cm sea level rise will cause a net reduction of 0.5 million metric tons of rice production which could feed about 3 million people for a year (Rawat et al 2016).
- High temperature and reduction in precipitation could cause the onset of droughts and which could affect crop yield. The projected drop of rice and wheat yield is by 8% and 32% respectively by the year 2050 due to climate change (IPCC, 2007). It is projected that agricultural GDP would be 3.1 percent lower each year because of climate change (Ahmed 2012).
- Climate change would lead to substantial yield reduction in rice crop in Bangladesh. Among the different climatic regions, maximum yield reduction will happen in south-Eastern and South-Western Regions of Bangladesh.

Table 13: Potential Impacts of Climate Change on Crop Agriculture in Bangladesh (MoEF, 2017)

Climate Change Effects	Potential Impacts
Increases in very hot days and heat waves	• Modification in crop suitability and productivity (heat stress). • Increase in weeds, crop pests and disease outbreaks. • Changes in crop water requirements. Increase risk of wildfire. • The quantity and quality of yield critically depend on the number of days that a crop is exposed to temperatures exceeding specific thresholds during critical growth stages (i.e., flowering, pollination, fruiting, or grain filling).
Fewer cold days and nights	• Increased yields in colder environments. • Reduction in the risk of frosts and subsequent crop failure.
Increase in intense precipitation events	• Damages to crops. Increased water-logging, inability to cultivate lands. Damage to the drainage system due to flooding. Increased extent and intensity of erosion and water-logging. Increased pest incidence.

Increases in drought conditions	• Lower yields from crop damage, stress, and/or failure. • Loss of arable land as a result of land degradation • Increased competition for water • Increased risk of wildfires • Increased risk of food insecurity
Increase in the frequency of floods	• Crop failure and damage to crops due to flooding. Yield decreases. • Increased risk of health hazard due to lack of nutrition
More frequent strong tropical cyclones	• Damage to crops, loss of lives and rural infrastructure • Frequent occurrence of cyclonic demotivates farmers to shift from farming
Sea level rise and storm surges	• Damage to crops and rural infrastructure due to flooding. • Seawater intrusion, loss of arable land, salinization of water supply
Increase in CO_2 concentration	• Increased biomass production and increased physiological efficiency of water use in crops and weeds. • Increased efficiency of water use by crops. • Potential increased weed competition with crops. • The photosynthesis, growth, and yield of C3 plants such as wheat and rice tend to benefit more from high concentration of CO2 than do C4 plants such as maize, sugarcane, etc.

Impacts on Livestock

- The direct threat includes the death of the animals and birds due to seasonal variation, nor'wester, tornado and cyclone, thunder, heat stroke and cold wave. The indirect threat is creating a huge stress condition to the animals and birds as result productivity and immunity is decreasing rapidly.
- The sea level rise will inundate new coastal areas, which will affect livestock by reducing grazing areas and fodder productions. IPCC has pointed out that the intensity of the drought will increase in the North and Western parts of Bangladesh.
- Climate change could affect the costs and returns of livestock production by altering the thermal environment of the livestock and thereby affecting their health, reproduction and the efficiency by which livestock convert feed into the retained product (especially meat and milk) (MoEF, 2017).

Impacts on Fisheries

- With sea level rise, salinity will further intrude inside the country reducing the freshwater area for freshwater fish production. Water salinity will exceed the desired level for freshwater fish cultivation. However, sea level rise will inundate low lying areas of the coastal region of Bangladesh that will increase water area for production of fish and shrimp in the coastal belt. Salinity increase and intrusion may create an opportunity for bleakish water/estuarine aquaculture and fisheries (brackish and marine fish/shrimp culture).

- High/extreme temperature may affect physical and chemical parameters of water affecting fish physiology, migration, growth, reproduction etc. Temperature rise may affect distribution pattern of some marine fishes and they may migrate to higher latitude for cooler water. Extreme and prolonged cold weather may affect fish and other aquatic animals, reducing their growth (MOEF, 2018).
- Ponds, rivers, canals, and beels dry up or retain insufficient water during dry/drought period affecting fish production in aquaculture and in open water fish production in the north-east region (Haor area in Sylhet basin) including north and north-west drought-prone area.

Table 14: Climate Change Impacts on Fisheries Sector of Bangladesh (MoEF, 2017)

Climate Change Effects	Potential Impact
Flood & River Bank Erosion	• High floods affect aquaculture – floods inundate pond dikes and fish escape, and damage pond dykes causing loss to the fish farmers. It pollutes pond waters and causes fish diseases. • Pond water pollution, disease and siltation. • River bed siltation by river bank erosion affecting fish migration, breeding ground, production and livelihoods of fishers.
Drought	• Water area and depth decreased/ dried up affecting fish stock, growth, breeding, production & biodiversity. • Increased vulnerability to disease. • Reduced fish production period. • Broods stock of natural fish and other fishes declined and production decreased and biodiversity declined.
Cyclone and Storm Surge	• Loss of coastal fishers' lives and properties (net, boats) • Damage of fish landing and marketing centers; • Damage of aquaculture infrastructure (embankment, sluice gate), hatcheries and nurseries, and loss of shrimp and fish. • Loss of coastal aquaculture production and livelihood. • Reduce employment opportunities and increase poverty.
Sea Level Rise	• Salinity intrusion and increase of saline water area facilitates brackish water aquaculture. • Increase of saline water area by inundation of low-lying coastal area will increase brackish water fish/shrimp production. • Change in oceanic water mass and oceanographic parameters affecting marine fish stock, fish migration and biodiversity.
Salinity Intrusion	• Inland open water fisheries area decreases affecting freshwater fish production and fishers' livelihood and income. • Positive impact on coastal shrimp culture. • Affect aquaculture pattern and fishing technology.
Erratic Rainfall	• Insufficient/irregular rainfall affect adversely the natural spawning of fish including major carp spawning in Halda River and Kaptai lake and ultimately fish production and fishers.

Temperature rise and Variation	• Affect breeding performance of fish and fish production in natural water bodies and fish/ shrimp hatchery. • Sudden or prolonged heat may affect fish breeding performance and aquaculture production. • Higher temperature increases metabolic function and growth of fish if DO_2 and food supply are optimum, fish growth and production increase. Higher temperature may enhance primary productivity but reduces DO_2 affecting aquaculture.
Heat Wave	• High temperature may affect fish breeding in hatchery and natural water and may cause fish/fry mortality in ponds/shallow waters.
Cold Wave	• Retarded growth affecting breeding performance and fish production.
Fogginess/ Cloudy Weather	• Causes fish mortality in aquaculture pond and small water bodies due to depletion of dissolve oxygen.

Box 15: Carp in the Halda River has Drastically Declined

In the year 2009, due to high and fluctuating temperature and late insufficient rainfall, aquaculture activity including fish hatchery performance and grow-out ponds were seriously affected in Mymensingh region of Bangladesh which is very important aquaculture area in the country. Spawning performance of major carp in the Halda river has drastically declined due to habitat degradation and change of climatic factors mainly temperature, rainfall pattern. It has also been reported by Department of Fisheries that during 2016 spawning of major carp did not occur in the Halda River because of insufficient rainfall and other unfavorable climatic parameters during the main spawning period, April-May 2016 (MoEF, 2017).

Impacts on Food Security

- Food security is a concept that encompasses more than just crop production but is a complex interaction between food availability and socio-economic, policy and health factors that influence access to food, utilization, and stability of food supplies.
- According to FAO statistics, Bangladesh has a moderate level of undernourishment, (between 20% and 34% of the population). A number of global studies point towards a negative outlook for the impact of climate change on food security in Bangladesh. National-scale studies also showed that Bangladesh's food security is highly vulnerable to the impact of future flooding.

Impacts on Water Resources

- Climate change will cause increased temperature; increased sediment, nutrient, and pollutant loadings from heavy rainfall; increased concentration of pollutants during droughts; and disruption of treatment facilities during floods. All these factors will deteriorate raw water quality and pose risks to drinking water quality even if it is treated by conventional methods (IPCC, 2014).
- Water sector in Bangladesh will be highly vulnerable to the changes in climatic parameters-temperature and precipitation; frequency, intensity and magnitude of extreme events, and rising sea level. Increased temperature and higher rates of soil moisture loss could lead to longer and high impact droughts in the country, especially in drier northern and western regions.

- Due to climate change, significant changes in flood magnitude, extent and depth could occur as projected by many recent studies. Excess precipitation in the monsoon months and inadequate precipitation together with higher temperatures in the dry season could result in the occurrence of flood peaks in the earlier months. There is an anticipation of increases flooding area by 6% by 2030 and 14% by 2050. In the case of extreme flood years, 80% or more of the country may be inundated at one time or the other (MoEF, 2017).
- Shortage of safe drinking water is likely to become more pronounced, especially in the coastal belt and in drought-prone areas in the north-west of the country. This will impose more struggles on women and children, who are responsible to reach far collecting drinking water for their families. Increasing saline drinking water can also result in health hazards.

Impacts on Human Health

- Climate change is likely to increase the incidence of water-borne and air-borne diseases (MOEF, 2018). Bacteria, parasites and disease vectors breed faster in warmer and wetter conditions and where there are poor drainage and sanitation. Which in turn will affect the health of many of the poorest and most vulnerable people of the country, especially urban slum dwellers. Acute illness is known to be one of the main triggers driving people into extreme poverty and destitution in Bangladesh.
- There would be an increase in the geographical distribution of vector organisms. i.e. malarial mosquitoes such as dengue fever (mosquito), malaria (mosquito), Kala-zar and a few others and childhood illness are projected to become more prevalent in the coming decades in Bangladesh if there is a rise in ambient temperature (MOEF, 2018).
- Another study shows that with an increase in average temperature of 2oC and a 10% alleviation in the probability of flooding across regions in Bangladesh, the incidence of Acute Respiratory Infection (ARI) is projected to increase two times to current, and the incidence of fever is projected to increase by 10% (MoEF, 2017).
- The incidence of food poisoning is also likely to increase due to noxious photochemical smog in urban areas and warmer summers, which would be amplified by hot weather (MoEF, 2012; MoEF, 2017).

Impacts on Infrastructure

Climatic disasters such as cyclone and flood of increasing frequency and intensity would reduce durability or damage partially or fully the existing infrastructure including roads, highways, railways, ports, embankments, polders, godowns, silos, cyclone shelters, electricity and telecommunication network etc. Damages to infrastructure could disrupt transport and communication systems with a chain effect on the overall economic activity and livelihood of the large population. People will lose employment. Prices of food items and other essential goods and services will rise due to the scarcity of supplies arising from the failure of the transport and communication systems. In addition to chronic poverty, transient poverty would significantly increase forcing many non-poor to become poor and poor to become extremely poor. The impacts of climate change are likely to be more widespread across all sectors of the economy and all sections of the population, with the poor and marginalized communities being the worst victims.

Bangladesh constructed thousands of kilometers of embankments for protection from the tidal and inland flood inundations. Rising sea level, possible increases in extreme rainfall, stronger cyclonic storms and associated surges are projected for Bangladesh. Therefore, construction and strengthening of embankments are one of the adaptation options suggested for protection from increased flooding due to climate change. According to the World Bank (2014), rehabilitating and upgrading the height of the polders would increase the resilience of coastal areas to cyclones, tidal and flood inundations, and salinity intrusion in Bangladesh.

- **Impacts on Construction Materials and Costs**
  Construction materials are usually climate sensitive. They are normally designed for the life of the structure or for a calculated period that keeps maintenance costs at a minimum level over the life span of the structure. Otherwise, the maintenance cost of the infrastructure (storm-water pipes, irrigation structure, etc.) would increase. Photo-catalytic coating, shotcrete and concrete 'eco-columns' are presently becoming popular to adjust with changing climatic conditions. Climate change has opened opportunities as well. New research on extreme climate proof materials would open opportunities for the industries and businesses.

- **Impacts on Design Codes and Standards**
  Average and extreme climatic conditions of the past will remain stationary over the future lifespan of infrastructure is the main assumption made for all present infrastructure and codes and standards that have been designed using climatic design values, calculated from historical climate data. The stationarity assumption is no longer valid because changing climate system due to substantial human interventions are altering the means and extremes of precipitation, evapotranspiration, and rates of discharge of rivers. For a 2oC global mean temperature rise, the probability of exceedance of a current 20-year flood of the Ganges River flood may change from 5% to 12%. The magnitude of the flood would be about 2.5 times more likely to occur than at present (MoEF 2018).

- **Impacts to Flood Proofing**
  In rural Bangladesh, raising homesteads above the highest flood level is a general norm. However, still a larger flood often inundates and the people adjust the level accordingly. The Bangladesh National Building Code (1993) defines the Flood Prone Area (FAP) to be that an area has the potential of being flooded by a meter of water. The code specifies that the lowest floor (including the basement) of any building located in the FPA should not be below the designated flood level.

- **Impacts on Drainage Infrastructure**
  Flooding situation gets worse due to inadequate drainage. Drainage congestion in the coastal polders and major cities such as as-Dhaka and Chittagong needs to be given attention under future climate change. Under future climate change, the number of short duration and heavy rainfall events could increase. This might result in increased water congestion, especially in the highly populated urban areas. The suggested adaptation measures are an improvement of urban drainage capacity including pumping provisions, detention storages and restoration of natural drainage canals; restoration of pervious surfaces for enhancing infiltration to groundwater aquifers; installation of new sewers, designed considering the climate impacts and retrofitting of the sewers whenever possible.

Impacts in Coastal Zone of Bangladesh

Nearly one-third of the total population (over 150 million) of Bangladesh lives in the coastal districts. The coast of Bangladesh, comprising of 19 out of 64 districts is exposed to multiple vulnerabilities. the coastal zone is prone to the cyclone, storm surge, tidal flood, coastal erosion, water logging, variations in temperature and rainfall, salinity intrusion and sea level rise. People living in these coastal low-lying areas often suffer the impacts of climate change and natural disasters. The poverty rate in the coastal zone is higher than the national average (World Bank, 2014).

- **Vulnerabilities due to Coastal Flood and Waterlogging**

  The coastal flood and water logging due to excessive rainfall often affect the coastal ecosystem. In future, the increased snow melts from the Himalayan permafrost, due to increasing temperature may force more water to flow through the Ganges, Meghna, Brahmaputra river systems and their river networks resulting in additional flooding extending over the central flood plains of Bangladesh. Moreover, increased flood

due to climate change may affect large areas with high incidences and casualties in the coastal zone of the country.

- **Vulnerabilities due to Cyclone and Storm Surges**
  World Bank reports (2010) that Bangladesh is located at the receiving end of at least 40% of the impacts of total storm surges in the world because of several geographical factors including funnel-shaped structure, shallow continental shelf, character of curvature of tropical cyclone in the Bay of Bengal, high tidal zone and low elevation land. The cyclone and storm kill people, mostly women, and children, and has devastating effects on the Sundarbans ecosystem. The local livelihoods and incomes related to agriculture, fisheries, forestry, and livestock are vulnerable to cyclonic events. The World Bank estimates that adaptation deficit of Bangladesh in relation to the cyclone is US$25 billion (World Bank, 2011; IPCC AR5, 2014). IPCC (2007) reports that increase of 2°C and 4.5°C of SST would cause an increase of 10 % and 25 % wind speed of cyclones, respectively which generally means that the intensity of cyclones will be increased with an increase in temperature.

- **Vulnerabilities due to Sea Level Rise (SLR)**
  According to Fifth Assessment Report (AR5) of the IPCC, sea level, ocean temperature and ocean acidity due to climate change will make the coastal ecosystems extremely vulnerable. IPCC (AR5) also estimates that the global mean sea level rose by 1.7 mm/year from 1900 to 2010 (WGI AR5 Section 13.2.2). This might be further increased from 8mm/year to 16mm/year between 2081 to 2100 with the high emission scenario. According to the World Bank report, Bangladesh would face 30 cm and 50 cm SLR in 2030 and 2050 respectively (World Bank, 2000). A recent report shows that there is a trend of increasing SLR at Hiron Point near Sundarbans by 7 mm/year, at Cox's Bazar by 13 mm/year from 1981 to 2013, at Khal No 10 in Chittagong by 20 mm/year during 1983 to 2012.

  SLR would exacerbate the impacts of cyclones and storm surges on the quality of water in Bangladesh, as such events have the potential to spread pollution from contaminated sources. For example, Cyclone Sidr in 2007 spread saline water to more than 6,000 ponds in the affected coastal districts of Bangladesh. Such kind of pollution in the future will increase the prevalence of waterborne diseases such as cholera and diarrhoeal diseases. The SLR in Bangladesh could displace millions of people from the coastal areas. The people of the exposed coast especially in Satkhira, Khulna, Bagerhat, Barguna, Patuakhali, Jhalkhati, Pirojpur, Barisal and Bhola are very vulnerable to SLR and surge flooding.

- **Vulnerabilities due to Salinity intrusion**
  Salinity intrusion in water and soil will be triggered by climate change and variability. The level of salinity is already increasing in many rivers including Garai, Baleswar, Pussur, Rupsa, Kobadak, Shibsha, and Ichamoti and so on, in the coastal region (World Bank, 2014). Studies indicate that people of some districts including Patuakhali, Pirojpur, Satkhira, Bhola, Khulna, Feni and Noakhali are suffering from salinity in both water and soil. According to a recent report of the World Bank (2014), a number of factors will manifest the salinity level in the water streams and these are mainly rainfall pattern, freshwater flow in the rivers, cyclone induced surge and SLR. The increase of salinity level in the river water devastatingly affects agriculture, water resources/supply, sanitation, river ecosystems, biodiversity and so on. The freshwater fish species and giant prawn (Golda) will be adversely affected. The income and the livelihoods of the local fishing communities will also be affected. Hence the local poor people might suffer from malnutrition.

Topic 3.4:
National Response to Climate Change

3.4.1 Adaptation and Mitigation

National Adaptation Programme of Action (NAPA)[8] identified vulnerable areas and fifteen projects as a future adaptation strategy. NAPA was updated in 2009 and identified forty-five adaptation measures. Some of the project ideas identified in NAPA are included:

- Reduction of Climate Change Hazards through Coastal afforestation with community participation
- Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise
- Capacity building for Integrating Climate Change in planning, designing of infrastructure, conflict management and land-water zoning for water management institutions.
- Climate change and adaptation information dissemination to the vulnerable community for
- emergency preparedness measures and awareness raising on enhanced climatic disaster
- Construction of flood shelter, and information and assistance center to cope with enhanced recurrent floods in major floodplains
- Mainstreaming adaptation to climate change into policies and programmes in different sectors (focusing on disaster management, water, agriculture, health, and industry).
- The inclusion of climate change issues in the curriculum at secondary and tertiary educational institution.
- Enhancing resilience of urban infrastructure and industries to impacts of climate change including floods and cyclone.
- Development of eco-specific adaptive knowledge (including indigenous knowledge) on adaptation to climate variability to enhance adaptive capacity for future climate change.
- Promotion of research on drought, flood, and saline tolerant varieties of crops to facilitate adaptation in the future.
- Promoting adaptation to coastal crop agriculture to combat salinization.
- Adaptation to agriculture systems in areas prone to enhanced flash flooding–North East and Central Region
- Adaptation to fisheries in areas prone to enhanced flooding in North East and Central
- region through adaptive and diversified fish culture practices
- Promoting adaptation to coastal fisheries through the culture of salt tolerant fish special in coastal areas of Bangladesh.
- Exploring options for insurance to cope with enhanced climatic disasters

National Adaptation Plan (NAP): A Roadmap for developing a National Adaptation Plan for Bangladesh was prepared in 2015. Bangladesh NAP Roadmap has considered the UNEP/UNFCCC LDC Guidelines. US$ 2.8 million has been provided by the Green Climate Fund (GCF) to prepare the NAP of Bangladesh. Developing a full-scale NAP is underway.

8 National Adaptation Programme of Action (NAPA) 2005, Ministry of Environment and Forest.

The Disaster Management Act, adopted in 2012 recognized the impacts of climate change and provided guidance for setting up an institutional mechanism for disaster management, reducing vulnerabilities, rehabilitation, and providing humanitarian assistance to the victims of both disasters and climate change impacts. Climate change adaptation is also briefly highlighted in the Coastal Zone Policy and National Agriculture Policy. In addition to these, the Road Map of National Adaptation Plans (NAPs), the National Sustainable Development Strategy, the Perspective Plan, the Sixth & Fifth Five Year Plan, the National Disaster Management Plan 2010 also provide some guidance for adaption measures needed for Bangladesh.

Ministry of Planning (MoP), developed the Sixth Five Year Plan (2011-15) and Seventh Five Year Plan (2016-20) consecutively and both plans provided compressive guidance to address climate change consistent with BCCSAP, 2009. The Sixth Five Year Plan (2011-15), incorporated two chapters on the environment, climate change and disaster management, namely chapter-8 in part one and chapter 10, in part two. Specifically, chapter 10 suggested to mainstream climate change into relevant sectoral policies and institutions and their political and economic processes and decisions. The Seventh Five Year Plan (2016-20) also incorporated a specific chapter on environment and climate change (Sector 8, Chapter 8) and provided guidance for addressing climate change with sectoral approaches considering the environment, climate change adaptation, and mitigation in a broader development context.

Some other sectors of the Seventh Five Year Plan (2016-2020) like agriculture and water identified the relevant strategies to mainstream climate change related activities within the specific sectoral plans and programs. The effective implementation of the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009 is recognized as a priority issue.[9] GoB is also developing Bangladesh Delta Plan 2100, considering the complexity of the Bangladesh delta, which necessitates a plan that can adapt to change. The Bangladesh Delta Plan 2100 will be a long-term holistic and integrated plan for the Bangladesh delta considering goals for the next fifty to one-hundred years.[10]

Sectoral Policies and Plans related to Adaptation: Water and water resources management, is one of the climate vulnerable sectors identified in BCCSAP, 2009 and Ministry of Water Resources (MoWR), is responsible to regulate the water resources in Bangladesh in accordance with the Rules of Business 1996 (revised in 2014). After adoption of BCCSAP in, 2009, MoWR adopted several policies, plans, programmes and legislations and this report reviews all these instruments. MoWR developed a Master Plan of Haor Areas, in 2012, which addressed climate impacts and vulnerabilities in water resources in Haor basins in its 23 sections and specifically three sections referred BCCSAP, 2009 explicitly. Master Plan of Haor Areas, 2012 recognized climate change and climate variability stating that, 'excess rainfall in the upstream hilly areas and subsequent runoff, river sedimentation, unplanned road and water management infrastructure, deforestation and hill cuts, landslide, improper drainage and the effect of climate change and variability can be viewed as the main reasons for the devastation caused by flash floods'.[11] Master Plan of Haor Areas, 2012 also recognized the climate change implications and the loss of fisheries biodiversity, which is evident in the haor area.[12] It also of identified the relevant pillars, themes and programmes of BCCSAP, 2009, relevant with haor basin management and climate change implications.[13]

Agriculture sector is one of the climate change vulnerable sector in Bangladesh. The policy responses to climate impacts on agriculture is developing significantly. Ministry of Agriculture (MoA), adopted Climate Resilient Crop Variety and Technology Development Policy in 2010, which identified the priority areas for developing climate resilient crop variety and technology including salinity tolerant high yielding variety; drought tolerant high yielding variety; heat tolerant high yielding variety; flash flood, water-logging &

9 Sec. 4.2, Chapter-4, Seventh Five Year Plan (2016-20)
10 http://bangladeshdeltaplan2100.org/wp-content/uploads/2016/02/BDP-Brochure-Final-september-2015.pdf
11 Sec 1.1, para-2, Master Plan of Haor Areas, 2012
12 Section, 3.2.3, Para 2, *Ibid*
13 Sec 4.3, *Ibid*

submergence tolerant high yielding variety; short duration high yielding variety; water use efficient high yielding variety; low input responsive/nutrient efficient high yielding.[14] MoA adopted the National Agriculture Policy in 2013 and one of the objectives of this policy is to promote effective initiatives to establish a self-reliant and sustainable agriculture that is adaptable to climate change and responsive to farmers' need.[15] The Policy of 2013 emphasized for research on the weather forecast in the context of climate change and crop production[16] and encouraged production and manufacturing of agricultural machineries suitable in socio-economic, environment and climate change context.[17]

MoA drafted **National Agricultural Extension Policy 2018** which identified nine principles include adoption to climate change and development of specialized extension service for climatically distressed areas. The draft policy also identified priority areas for climate adaptation include integrated approach involving concerned ministries and departments; resilient extension practices for different climatically stressed and saline conditions; strengthen capacity of NAES organization and documenting and promoting indigenous farmer practices against disasters and vulnerabilities.[18] This draft policy also mentioned the BCCSAP, 2009 as a guiding document.

MoA, developed the **Master Plan for Agricultural Development** in the Southern Region of Bangladesh in 2013 and the objective and focus of the plan included developing climate resilient infrastructure.[19] Sec 1.4 of the plan mentioned the BCCSAP, 2009 and NAPA, 2005 with due reference of programs of these two documents. This plan identified the challenges related to climate change and sea level rise and to develop capacity and resilience to offset negative impacts of climate change.[20] MoA also developed the Plan of Action on Disaster and Climate Risk Management in Agriculture in 2015 and the Department of Agricultural Extension is implementing this plan. MoA is also developed Medium Term Strategy and Business Plan, 2012-13 to 16-17, which addressed the key aspects of climate change and agricultural aspects. Agricultural Research Vision 2030 also provided detail guidance on research on climate change and agriculture. MoA is also developed the Institute of Research and Training on Applied Nutrition (BIRTAN) Act, 2012, the Bangladesh Agricultural Research Institute (BARI) Act, 2017 and these legislations provide guidance on trainings and research works.

GoB developed the **Bangladesh Country Investment Plan: A road map towards investment in agriculture, food security and nutrition***,* in 2011 (known as CIP) and climate change identified one of the challenges for agriculture, food security and nutrition.[21] CIP is built on key sectoral policies and consistent with BCCSAP, 2009.[22] This Plan, set out the expected outcome from Programme: Sustainable and Diversified Agriculture through Integrated Research and Extension, included resilience to climate change is increased through effective generation and propagation of sustainable technological innovation/solution. It suggested to promote the development of responses to adapt agricultural systems to climate change and high priority was given to research on: development of salt and drought tolerant plant varieties; new insects and diseases due to climate change; the development of new flexible HYVs; adaptation (of crops, fisheries and livestock) to climate change; and adaptation trials in the vulnerable climatic regions. Given the increased scarcity and degradation of natural resources, these responses should pay attention to be environmental sound. As to the strategies for adaptation, this plan included, development of a master plan for accelerating the development and dissemination of climate resilient technology for unfavorable eco-systems; support to agro-climatic and ecological data bases*;* and the management of dry, wet and char land and biodiversity. [23]

14 Section 01, Climate Resilient Crop Variety and Technology Development Policy, 2010
15 Section, 2.1, the National Agriculture Policy, 2013
16 Section 4, *Ibid*
17 Section 9, *Ibid*
18 Section 11, para 53, (Draft) National Agricultural Extension Policy
19 Section, 1.3. c. Master Plan for Agricultural Development in the Southern Region of Bangladesh in 2013
20 Section, 5.1, *Ibid*
21 Section 1.1, the Bangladesh Country Investment Plan: *A road map towards investment in agriculture, food security and nutrition,* 2011
22 Section 3.5, Ibid
23 Sec.8, Ibid

Ministry of Food developed the National Food Policy Plan of Action 2008- 2015, which identified climate change that poses an additional burden on food security, especially in areas where agriculture and water resources are already under stress due to adverse meteorological conditions.[24] Ministry of Health and Family Welfare (MoHFW), adopted the Health Policy in 2011, which provided guidance to adapt with climate impacts and relevant diseases. MoHFW also prepared the Strategic Plan for Health, Population and Nutrition Sector Development Program, (HPNSDP) for 2011-2016. This plan, identified the need for building capacity and strengthen health systems to combat the health impact of climate change, and the Climate Change and Health Promotion Unit (CCHPU) has been formed to strengthen necessary activities.[25] MoHFW, is also adopted the National Nutrition Policy, in 2015 and this policy provide provision to adapt for ensuring food security, employment and disease management strategies in line with the situation related to climate change in Bangladesh.[26]

Bangladesh Country Investment Plan for Environment, Forestry and Climate Change Bangladesh Country Investment Plan for Environment, Forestry, and Climate (EFCC CIP) provides a five year (2016 – 2021) strategic framework for national and international investments to address EFCC issues in Bangladesh and to coordinate implementation among all stakeholders. The EFCC CIP identifies priority areas for investment in the EFCC sectors and estimates the financing to be provided by the GoB and its development partners. The EFCC CIP reflects the measures and targets submitted by the GoB to the United Nations Framework Convention on Climate Change (UNFCCC).

Pillar 3 of this CIP is related to adaptation and resilience to, and mitigation of, climate change and programme 3.4 related to increased resilience at the community level. The investment areas proposed in this programme are in line with the NDC and the BCCSAP. The programme comprises the two sub-programmes as follows:

1. Develop community adaptation through community-based and ecosystem-based adaptation
2. Scale up local innovations on adaptation

Priority investment areas under subprogramme-1

- Supporting and maintaining action research to continuously improve the adaptation of communities (including various stakeholders within communities, such as women and men, the young and old, and exploring alternative livelihood options) to natural disasters such as floods, drought, cyclones, and rising sea levels
- Supporting and building the capacity of communities and extension officers (e.g. through conferences and workshops) to manage ecosystems so as to prevent degradation and enhance carbon sequestration
- Supporting the integration of ecosystem-based management practices into national and regional strategies and action plans, such as the disaster management plan
- Developing a gender-sensitive mechanism or plan for the participation of communities in forest development
- Supporting and building community resilience to climate-attributable diseases

24 Sec-1.1.2, para-6, the National Food Policy Plan of Action 2008- 2015
25 Sec 3.5, the Strategic Plan for Health, Population and Nutrition Sector Development Program, 2011-2016
26 Sec 6.5.9, the National Nutrition Policy, 2015

Priority investment areas under subprogramme-2

- Providing support for, and building capacity in, political leadership, visioning and commitment across political cycles to create an environment in which innovation at the national and local levels can thrive
- Strengthening national–local linkages, both vertically and horizontally
- Supporting studies on economic and climate-change-related effects of local innovations and their possible contributions to national strategies and action plans
- Provision of financial resources to individuals through a micro-credit system, targeting women and the vulnerable and marginalized, for innovation development
- Creating a platform for people to share ideas
- Reviewing and updating institutional arrangements for patents
- Popularizing floating-agriculture-based vegetable production technologies

Delta Plan 2100 Bangladesh

In view of the long-term challenges presented by climate change and natural hazards, the General Economics Division (GED) has formulated 'Bangladesh Delta Plan (BDP)-2100' with support from the government of the Netherlands.

BDP-2100 has been conceived as a techno-economic, long-term, holistic, water-centric integrated plan. An interactive planning process has been followed for the finalization of this mega plan over the last four years. BDP-2100 focuses on how to enable socio-economic development under uncertain changing conditions, especially regarding climate change and scarce water resources. The plan is holistic, considering many themes and sectors and bringing together individual strategies as well as integrated ones for the whole country in a single plan.

BDP-2100 sets up a long-term vision for the evolution of the Bangladesh Delta by the end of the 21st century towards 'achieving a safe, climate resilient and prosperous delta'. As steps to reach that vision, it envisages short to medium term goals to achieve upper middle-income status eliminating extreme poverty by 2030 and become a prosperous country by 2041 with the longer-term challenge of sustainable management of water, ecology, environment and land resources in the context of their inter-relation with natural disasters and climate change.

Implementation of the BDP-2100 involves total spending on delta-related interventions, through new projects and maintenance of new and old projects, which will gradually increase up to a level of 2.5 percent of GDP per annum by 2030. The BDP-2100 Investment Plan up to the year 2030, prepared in cooperation with World Bank group, consists of a total of 80 projects: 65 are physical projects, and 15 are institutional and knowledge development projects. Its total capital investment is estimated at Tk 2,978 billion ($37 billion). The investment plan projects have been selected following multi-criteria analysis and in-depth consultation with the stakeholders. The six hotspots are:

i. Haor and Flash Flood Area
ii. Coastal Zone
iii. Chattogram Hill Tracts
iv. Urban Areas
v. Drought-prone Areas and
vi. River Systems and Estuaries.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009

BCCSAP provides the climatic contexts, analysis of socio-economic realities, and outlines policies for promoting the well-being of vulnerable groups and elaborates a set of programmes based upon six broad areas (pillars) of interventions. BCCSAP, 2009, identified 44 adaptation and mitigation programmes based on the following six pillars: (1) food security, social protection and health, (2) comprehensive disaster management, (3) infrastructure, (4) research and knowledge management, (5) mitigation and low-carbon development, (6) capacity building and institutional strengthening

Intended Nationally Determined Contributions (INDC), 2015: The government of Bangladesh developed the INDC which is now the NDC for GOB as to the Party of the Paris Agreement. The NDC of Bangladesh intends to take necessary mitigation actions to reduce its growing emissions of GHGs and to play its role in global efforts to limit temperature rise to two degrees or preferably 1.5 degrees above pre-industrial levels agreed in Paris Agreement. The NDC includes both unconditional and conditional emissions reduction goals for the power, transport and industry sectors, alongside further mitigation actions in other sectors, which Bangladesh intends to carry out. Bangladesh intends to implement its conditional emissions reduction goal subject to appropriate international support in the form of finance, investment, technology development and transfer, and capacity building. Now the government is working to develop an NDC implementation framework. The following table 15 and 16 are providing some data and information:

Table 15: Nationally Determined Contributions – Mitigation

Unconditional contribution	Contribution assuming no additional international support	• Bangladesh will reduce its GHG emissions in the power, transport, and industry sectors by 12 MtCO2e by 2030 or 5% below BAU emissions for those sectors
Conditional contribution	Contribution assuming additional international support	• Bangladesh will reduce its GHG emissions in the power, transport, and industry sectors by 36 MtCO2e by 2030 or 15% below BAU emissions for those sectors.

Table 16: Projected emissions reductions in the power, transport and industry (energy) by 2030

Sector	Base year (2011) (MtCO2e)	BAU scenario (2030) (MtCO2e)	BAU change from 2011 to 2030	Unconditional contribution scenario (2030) (MtCO2e)	Change Vs BAU	Conditional contribution scenario (2030) (MtCO2e)	Change Vs BAU
Power	21	91	336%	86	-5%	75	-18%
Transport	17	37	118%	33	-9%	28	-24%
Industry (energy)	26	106	300%	102	-4%	95	-10%
TOTAL	64	234	264%	222	-5%	198	-15%

NDC Implementation Roadmap and Sectoral Plans: GoB adopted an Implementation Roadmap for Nationally Determined Contributions (NDC), in 2017, which outlines the basic structures as follows (MoEF, 2017).

NDC implementation in Bangladesh: provided guidence on policy and institutinoal ladscaspes through review of the existing policies and institutions.

Governance and coordinations: provided oversight on governance and coordination to implement the NDC through structuring the NDC-NAP Advisory Committee, NDC-NAP coordination Committee, NDC and NAP implementation analytical support, NDC sectoral working groups and NAP Sectoral Working Groups.

Resource Plan: provided an inestoment plan through Identification of the key aspects of mitgation and dapatation measures and requied need for financial reourses. It also identified source of financial resources ay national, international and bilateral levels and provided guidence for access and effective utilizations of the reousrses.

Measurement, Reporting and Verification (MRV): provided guidence for MRV related to the GHG inventory, GHG projections, Measurement and evaluation of individual measures, Governance for MRV, The MRV system and NDC implementation activities: MRV.

Sectoral Plan: This roadmap also developed three sectoral plans for mitigations as follows:

- NDC sectoral mitigation action plan for Power Sector;
- NDC sectoral action plan for Industry Sector
- NDC sectoral action plan for Transport Sector

Sectoral Policies related to Mitigation in Bangladesh: There are quite a good number of sectoral policies, legislations, and strategies and action plan to address the mitigation issues. To achieve low-carbon climate resilient development, the Sustainable and Renewable Energy Development Authority Act (SREDA) in 2012, which established the Sustainable and Renewable Energy Development Authority, with a view to promoting the development and use of renewable energy in Bangladesh. This Act mandates the said authority to take all necessary steps to prepare plans, programmes and to implement such plans, programmes for promoting renewable energy in the country. The Act, identified the basic structures and functions of the Authority and some of the specific functions of the Authority include to promote the use of power and energy efficient equipment, ensure standardization, labelling of power and energy using equipment and appliances, develop and implement the energy-efficient building code, provide technical and financial assistance in research, development, demonstration and training on renewable energy, promote energy efficiency activities in private sector through implementation of pilot projects and commercialization of renewable energy[27].

In 2008 Renewable Energy Policy of Bangladesh, was adopted which provides guidance for promoting renewable energy and for the establishment of related institutional structures, regulatory frameworks, and mechanisms for technical and financial support. The Policy of 2008 identified the major sources of renewable energy which include solar, wind, biomass, hydro, geothermal, tidal wave etc. and set the goal of generating renewable energy constituting 5% of total generation by 2015 and 10% by 2020. This Policy also set the objectives to harness the potentials of renewable energy resources and dissemination of renewable energy technologies in rural, peri-urban and urban areas. GoB is also committed to facilitating public and private sectors for renewable energy investments[28]. The Policy suggests establishing the Sustainable Energy Development Agency (SEDA) in accordance with the statutory law of the country and to regulate the activities related to renewable energy in Bangladesh. The National Energy Policy previously adopted in 1996, also committed to promoting rational use of energy sources and environmentally friendly development of renewable energy[29].Besides the policy, for GHGs emission reduction GoB recently adopted some action plans. In 2014 GoB adopted Bangladesh National Action Plan (NAP) for Reducing Short Lived Climate Pollutants

27 Sustainable and Renewable Energy Development Authority Act, 2012, Sections 4 and 6.
28 The Renewable Energy Policy of Bangladesh, 2008, Section 1.2, 1.3, & 2.
29 The National Energy Policy, 1996, Section 1.2.

(SLCPs) and in 2015 Energy Efficiency and Conservation Master Plan up to 2030 is adopted to reduce the use of black carbon and the GHG emissions.

This above-mentioned plan also mentioned the SDGs goals including Goal 13, which urges to take urgent action to combat climate change and its impacts and commitments of the Paris Agreement on climate change adopted in 2015. [30] Most importantly, this plan is considering the commitments of Bangladesh made by submitting Intended Nationally Determined Contributions (INDC)" in September 2015, which is now NDCs for Bangladesh under the Paris Agreement on climate change.[31] Moreover, this plan considered the recent trend and prospects of UNFCCC policy regime and IPCC scientific reports including Fifth Assessment Report (AR5) of IPCC.[32]

Ministry of Science and Technology (MoST), adopted the National Science and Technology Policy (NSTP), in 2011 and the mission statement of this policy encouraged research on Green technology to harness natural resources and conservation the ecosystem which acts as a carbon sink and a buffer against climate change.[33] It further encouraged 'research and applications to forecast, prevent and mitigate natural disasters and hazards like earthquakes and floods, drought, cyclones, erosions, sea level rise etc. caused by climate changes'.[34] The Action Plan, developed in 2012, under the National Science and Technology Policy, 2011 is also addressed climate change

Besides energy sectors, transports (including land and water) sector can also play a vital role to promote the low- carbon climate resilient development in Bangladesh. There are about fifteen laws and regulations exist in Bangladesh. The Vehicles Act was adopted in 1927 and supplemented by adopting the Motor Vehicles Ordinance, enacted in 1983, which established the Bangladesh Road Transport Authority outlining the basic structure and functions. The Railways Act was adopted in 1890 and the Bangladesh Inland Water Transport Ordinance was adopted in 1958. The Inland Shipping Ordinance was enacted in 1976 and the Prevention of Interference with Aids to Navigable Waterways Ordinance was adopted in 1962. These legislations and policies need to be amended to incorporate mitigation aspects of climate change. The following specific sectors need to adopt and/or amend relevant policies and legislation to address mitigation aspects in Bangladesh.

- Power sector
- Transport
- Energy intensive industries – public and private
- Agricultural sector (including crop, livestock and poultry)
- Forestry
- Waste generation and disposal
- Residential/commercial
- Cross-sectoral options
- Renewables (solar PV, biomass and wind)

Clean Development Mechanism (CDM): From Bangladesh, so far 13 CDM projects have been registered at CDM Executive Board. Additional 08 projects have been approved by DNA and host country approval letter has been issued. Due to the fall of the price of Certified Emission Reductions (CERs) (CERs or per ton price of carbon dioxide is below US$1), the CDM projects has virtually come to a standstill world over. There are two projects namely Solar Home System of the IDCOL and Improved Brick Kiln project of Grameen Shakti have already received the Certified Emission Reductions.

30 Sec 3.1.2, Ibid
31 Sec 4.1.2, Ibid
32 Sec 4.2.1, Ibid
33 Section, 4. MISSION, the National Science and Technology Policy (NSTP), 2011
34 Section, 5, Ibid

Joint Credit Mechanism (JCM): JCM is a bilateral mechanism between Japan and 16 developing countries, including Bangladesh. JCM is an almost similar mechanism like CDM but comparatively simplified. Through the initiative, Japanese energy efficient technology shall be transferred to Bangladesh and other developing countries. Japanese government shall provide up to 50% grant to partner countries for acquiring energy-efficient technologies. So far 03 energy efficient technologies have already been transferred to Bangladesh and 03 others including a 50 MW solar power plant have been selected and are in different stages of implementation.

Short-Lived Climate Pollutants (SLCPs): Bangladesh is one of the founder members (Bangladesh, Canada, Ghana, Mexico, Sweden, and the USA) of the Climate and Clean Air Coalition (CCAC) - that formed on 16 February 2012, to reduce SLCPs. Bangladesh has already taken some initiatives under CCAC to reduce SLCPs, such as:

- replacement of inefficient traditional cookstoves with clean cookstoves;
- transformation of brick kilns with modern technology and
- use of the alternate wetting and drying method for paddy rice cultivation to reduce methane emission.

Bangladesh adopted SLCPs NAP (National Action Plan for Reducing Short-Lived Climate Pollutants) which contains 16 actions plan, seven for reduction of black carbon and 9 for reduction of methane. Bangladesh is a lead partner of CCAC Initiatives, namely "Reduction of Methane Emission from Paddy Rice under CCAC Agriculture Initiative" and "Global Strategy for Emission Reduction from Ports & Marine Vessels and Clean Fuel and Vehicle Standards under CCAC Initiative on Black Carbon Emissions reduction from Heavy-Duty Vehicles and Engines."

Initiatives on Renewable Energy: Following initiatives are noteworthy for mitigation related activities in Bangladesh:

- The Government has envisioned achieving 500 MW solar power developments in Bangladesh with the support of domestic and external resources.
- Utilization of solar irrigation pumps has been given greater emphasis at large scale in agriculture sector replacing diesel-run pumps. Bangladesh has installed 324 solar irrigation pumps already and has targeted install 1500 solar irrigation pumps by 2018.
- The Government has exempted all taxes from the devices and equipment used for the utilization of renewable energy solar energy.
- We have also put greater emphasis on energy efficiency and energy conservation in different industrial production systems and utilities. The country has taken the concrete initiative to build new energy efficient Combined Cycle Power Plants as opposed to inefficient Single Cycle Power Plants.

Bangladesh has so far installed around 4.4 million solar home systems (SHSs) across the country meaning that almost 18 million beneficiaries are getting solar electricity which is around 11% of the total population of Bangladesh. According to the Renewable Energy Policy of Bangladesh, the government has a target to supply 10% energy from renewable sources by 2020. The government has exempted all taxes from the devices and equipment used for the utilization of renewable solar energy.

To reduce emissions from biomass burning, so far 1.62 million ICS have been disseminated and IDCOL has set a new target of disseminating a total of 5 million ICS by 2021[35].

The government has taken initiatives to promote Improved Rice Parboiling System in order to reduce the carbon emission and ensure energy efficiency. With the support of GIZ, initially, survey and assessment of

35 http://idcol.org/home/ics accessed on 24 January 2019.

technology requirements were assessed. A total of 75 improved rice parboiling system have been installed in different rice mill clusters till June 2017. Department of Environment is in the process of preparing future investment project on rice parboiling[36].

Air Pollution Control: To improve the overall air quality of the country, the Department of Environment is implementing projects and initiatives with the co-operation of international donor agencies. Among this, Clean Air and Sustainable Environment (CASE) Project supported by the World Bank for the period of 2009-2016 has established 11(eleven) Continuous Air Monitoring Stations (CAMS) at various places of important cities in the country which include Dhaka, Chittagong, Rajshahi, Khulna, Barishal, Sylhet, Gazipur and Narayanganj. The program encompasses the operation of the sampling and monitoring network, and quality assurance activities to ensure the quality of the data collected and disseminated. In addition, there is a Transboundary Air Quality Monitoring Station operating at Syamnagar of Shatkhira district.

Vehicular Emission Inspection Program: Air pollution from traffic sources is a major environmental challenge in the burgeoning metropolitan cities of the developing nations confronting today. Poorly maintained older technology vehicles contribute disproportionately to vehicular emissions. Among the polluting vehicles, the diesel-run ones are the worst. Emission tests for diesel vehicles are conducted in different parts of the country, including Dhaka and Chittagong to ensure that the test vehicle constitutes a representative sample of vehicle pollution as far as possible.

Air Pollution Emission from Brick Kiln: Emission of huge quantity of toxic elements from the brick kiln is causing air pollution. To reduce emission from the traditional brick kiln, aim at energy efficiency and environment-friendly brick technologies, the government introduces "Brick Manufactures and kiln Establishment (Control) Act 2013". This act was enacted on 1st July 2014. Existing forms of brick kiln technology are prohibited according to the "Brick Manufactures and kiln Establishment Control act 2013". Cleaner technologies such as Hybrid Hoffman Kiln (HHK), Zigzag Kiln, Vertical Shaft Brick Kiln, Tunnel Kiln or other improved technologies should be implemented by this act. Any kind of woody fuel is prohibited for burning bricks. Moreover, a low-grade coal, consisting high Sulphur, ash, mercury or any other material cannot be used as fuel in the brickfield and also no brick field cannot be established in municipality or City Corporation within 1 kilometer.

To implement the "Brick Manufactures and Kiln Establishment (Control) Act, 2013" in field level, several consultation meetings were held with Brick Manufacturing Owners Association, Journalists, NGOs, and Law implementing Agency. In this respect, different training workshops were organized with Brick Manufacturing Owners Association in the district and divisional offices of DoE.

3.4.2 Bangladesh Climate Change Trust Fund (BCCTF)

Recognizing the uncertainties and inadequacies of international climate adaptation finance from both multilateral and bilateral sources, the Government of Bangladesh decided to establish the Bangladesh Climate Change Trust Fund (BCCTF). To provide BCCTF a legal footing, a law titled Climate Change Trust Act 2010 was enacted. These are the landmark initiatives of the Hon'ble Prime Minister Sheikh Hasina. In recognition to her strong leadership in implementing these initiatives for combating unseen and unprecedented natural hazards and safeguarding the environment, the UN honoured the Hon'ble Prime Minister with the highest Award on Environment, "Champions of the Earth" in 2015 under the Policy Leadership Category.

The BCCTF was created in FY 2009-10 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. Projects taken under BCCTF are based on the thematic areas mentioned in BCCSAP 2009. From 2009-10 to 2018-19 Tk. 3500 crore have been allocated in Climate Change Trust Fund. Up to December 2018, a total of 68 projects have been under taken from CCTF. Among them 624 belongs to the government ministries/divisions (with the

36 https://www.giz.de/en/downloads/2017-06-01-Improved%20Rice%20Parboiling%20System.pdf accessed on 30 January 2019.

estimated cost of Tk. 3217.17 in crore) while the remaining 63 projects are being implemented by different NGOs under the supervision of Palli Karma Sahayak Foundation (with the estimated cost of Tk. 25 in crore). Till December 2018, 286 government projects have been completed with an estimated cost Tk. 2097 million and 57 NGO projects have been completed.

Table 17: Key Adaptation Projects under Bangladesh Climate Change Trust Fund (BCCTF)

SN	Name of the Project	Implementing Agency	Estimated Cost (In lac taka)
1	Adaptation project for innovation of various climate tolerant species/ technology and adaptation of the same in various ecological dispersion through Nuclear Agricultural Research	Bangladesh Institute of Nuclear Agriculture (BINA)	390.00
2	Construction of Cyclone resilient houses at Satkhira District due to adverse impact of cyclone AILA.	Satkhira Zila Parishad	345.00
3	Safe Water Supply, Sanitation & Biogas Technology for Rural Livelihood Improvement among the Climate Victims of Bangladesh.	Centre for Irrigation & Water Management (CIWM), Rural Development Academy (RDA), Bogra	1,398.00
4	Production and distribution of climate resilient seeeds at different climate vulnerable areas.	Bangladesh Agricultural Development Corporation (BADC)	400.00
5	Development an irrigation system through installation of canal at Godagari Upazilla of Rajshahi district To reduce the adverse impact of climate change at drought prone area.	Barind Multipurpose Development Authority (BMDA)	253.00
6	Re-excavation of Khal of Madaripur sadar and Rajoir Upazilla of Madaripur district.	Bangladesh Water Development Board (BWDB), Madaripur.	700.00
7	Construction of Rabar dam at Chella khali river at Nalitabari union of Shariatpur district.	Bangladesh Agricultural Development Corporation (BADC), Shariatpur.	500.00
8	Construction of school cum cyclone shelter at Pirojpur district.	Local Government Engineering Department (LGED), Pirojpur.	1,200.00
9	Distribution of Pure drinking water at Monpura and Charfashon Upazilla under Bhola district due to adverse impact of Climate Change.	Department of Public Health Engineering (DPHE), Bhola.	1,000.00
10	Adaptive measures in the context of climate change impact on health sector in Bangladesh	Climate Change and Health Promotion Unit Ministry of Health and Family Welfare	200.00

Table 18: Key Mitigation Projects under Bangladesh Climate Change Trust Fund (BCCTF)

SN	Name of the Project	Implementing Agency	Estimated Cost (In lac taka)
1	Market Development Initiative for Bondhu Chula-	Department of Environment (DoE)	1,000.00
2	Supplying of safe drinking water by solar Desalination/Purification panel to the climate vulnerable areas of Bangladesh	Palli Daridro Bimochon Foundation (PBDF)	1,000.00
3	Reduction of carbon emission and usage of alternative/ renewable energy expansion project through the extension of biogas technology.	Bangladesh Council of Scientific and Industrial Research (BCSIR)	400.00
4	Installation of Solar System at Bangladesh Jute Research Institute	Bangladesh Jute Research Institute (BJRI)	70.00
5	Installation of Solar System at Union Information Service Center.	Palli Daridro Bimochon Foundation (PBDF) & A2i	2,399.58
6	Eco-restoration of Hill Forests, Cox's Bazar	Forest Department, Cox's Bazar	550.00
7	Re-vegetation of Madhupur Forests through Rehabilitation of Forest Dependant Local and Ethnic Communities (Phase-II)	Forest Department, Tangail.	942.00
8	Development of Carbon sink through afforestation at Kaptai , Chittagong	Forest Department, Kaptai,	500.00
9	Installation of Solar street light at Mirkadim Pourashava.	Mirkadim Pourashava.	100.00
10	Afforestation Project in the Coastal Belt to Combat the Adverse Impact of Climate Change (Amended)	Forest Department	2,406.00

Climate Fiscal Framework

In 2014, the Ministry of Finance developed Climate Fiscal Framework, which provides principles and tools for climate fiscal policy-making, helping to identify the demand and supply sides of climate fiscal funds and to ensure that climate fiscal policies are transparent and sustainable in the longer term. Moreover, Bangladesh is also taking necessary initiatives for accessing the fund from Green Climate Fund (GEF) and the ERD of Ministry of Finance is acting as the National Designated Authority (NDA) of Bangladesh to GCF. NDA has also initiated a process to get Bangladeshi institutions accredited as National Implementing Entity (NIE) to GCF and identified fourteen national entities, those have the high potential to be eligible to fulfill the criteria set by the GCF board to gain accreditation. Recently PKSF and IDCOL got accredited at GCF.

3.4.3 Technology

NAPA, prepared in 2005, provided the projects ideas on 'promotion of research on drought, flood, and saline tolerant varieties of crops to facilitate adaptation in future' and promoting adaptation to coastal crop agriculture to combat increased salinity (Project Nos. 10 &11). BCCSAP, prepared in 2009 based on NAPA processes, recognized the ongoing research works of BRRI, BARI and other research centres under NARS to develop cultivars adapted to likely future climatic conditions and also identified the urgent need to develop the research capacity of these institutes and scientists, and to provide better research facilities (BCCSAP, 2009-Programme:1). INDC, submitted to UNFCCC by Bangladesh in 2015, which is now the NDC for Bangladesh in accordance with the Paris Agreement, 2015, identified the adaptation priority for stress tolerant (salinity, drought, and flood) variety improvement (GoB, 2015a; GoB, 2015b).

7th FYP suggested to promote science-led agriculture technology systems and encourage research and adoption of modern agricultural practices for development of drought, submergence, and saline prone agriculture. It also suggested for climate-smart/ resilient technologies; introduce salinity, submergence and other stress-tolerant varieties especially in the southern regions (Planning Commission, 2015). Coastal Zone Policy, adopted back in 2005, suggested for developing the salt-tolerant crop varieties along with possible measures to resist salinity (Section 4.4.5). Agriculture Policy, 2013, National Agricultural Extension Policy, 2012, Integrated Small Scale Irrigation Policy, 2014, National Disaster Management Policy, 2015 provided some guidance for research works on climate change, saline water intrusion and technological developments for sustainable agriculture in Bangladesh. Specific Plan of Action on Disaster and Climate Risk Management in Agriculture for the DAE adopted in 2015, which also provides guidance for saline tolerant crops in Bangladesh.

BCCSAP was adopted in 2009 and this strategy and action plan adopted the programme on renewable energy development under the thematic area of mitigation and low carbon development (programme-4, theme-5,) with the objective of maximizing the use of renewable energy sources to lower GHG emission and ensuring energy security. This plan also identified the scope for developing renewable energy including solar and suggested for providing incentives, where required to promote renewable energy in Bangladesh. INDC, submitted to UNFCCC by GoB in 2015, specifically identified the need for investment of .60 billion USD, by 2011-2030 for solar irrigations pumps, while renewable energy is identified as a means of meeting conditional and unconditional commitments of NDCs under the Paris Agreements (GoB, 2015)[37].

7th Five Year Plan suggested to expand the farm mechanizations, by increased use of solar power as a source of energy, (Section 4.2.3.) for improving productivity, reducing the cost of production, and achieving timeliness of crop production operations in a sustainable manner in Bangladesh (Planning Commission, 2015). Some other strategies and plans including Perspective Plan of Bangladesh 2010-2021, and National Sustainable Development Strategy (NSDS) identified the solar as an important source of sustainable energy and provided suggestions for using of solar energy in off-grid rural areas and in irrigation through subsidizing capital costs (Section 4.3 & 5.3 of NSDS 2010-21).

Renewable Energy Policy adopted in 2009 which aims to meet 5% of total energy demand through renewable sources by 2015, and 10% of total demand by 2020 and recognized the different sources of renewable energy including the solar as the primary source of renewable energy. Some other policies in Bangladesh include Integrated Small-Scale Irrigation Policy, 2014, National Agriculture Policy, 2013, National Organic Agriculture Policy, 2016 and Agricultural Research Vision 2030 recognized the use of solar energy in off-grid rural areas and for irrigation. Moreover, Sustainable and Renewable Energy Development Authority was established by the Ministry of Power Energy and Mineral Resources through SREDA Act, 2012 with a view to promote renewable energy in Bangladesh including solar and to assist to identify sources of financing and make necessary arrangement to provide financial incentives to attract and encourage private investment in renewable energy sector.

37 Bangladesh submitted Intendent Nationally Determined Contribution (INDC) to UNFCCC in 2015, which is now Nationally Determined Contribution (NDC) as to the Party of the Paris Agreement, 2015

In 2012, MoEF prepared Technology Needs Assessment and Technology Action Plans for Climate Change Adaptation. This report prioritized water and agriculture sector as the most vulnerable ones where immediate technological measures are required to make these sectors/ subsectors resilient to the impacts of climate change. In this context, a number of technology options have been identified.

The technology options for the water sector include:

a. Rehabilitation of existing embankments/dikes and dredging,
b. Tidal barriers (sluice gates),
c. Tidal river management including computer simulation of tidal flow,
d. Comprehensive disaster management incorporating early warning systems and involving the community,
e. Monitoring of sea level rise, tidal fluctuation, salinity intrusion, sedimentation and coastal erosion and
f. Urban Infrastructure development
g. On the other hand, the technology options for the agriculture sector include;
h. Development of salinity-tolerant rice varieties
i. Development of drought-tolerant rice varieties
j. Development of short-maturing rice varieties
k. Training on improved farming practices for crops, irrigation and water management, soil fertility management (conservation and restoration of soil quality) etc.
l. Establishment of climate-smart Agriculture Technology Dissemination Center
m. Establishment of special agricultural R & D Centre
n. Land-use planning

In the year 2012, MoEF also prepared Technology Needs Assessment and Technology Action Plans for Climate Change Mitigation. Considering the country's long-term development priorities and strive for poverty reduction and economic growth, this report prioritized the country's 'power generation and use' for its GHG mitigation potentials.

The technology options for power generation include; (MoEF, 2012)

a) Natural gas combined cycle
b) Solar home PV
c) Advanced combustion turbine
d) Advanced natural gas combined cycle
e) Integrated Gasification Combined Cycle (IGCC) Single unit
f) Integrated Gasification Combined Cycle (IGCC) Double unit
g) Advanced Pulverized Coal (APC), Single Unit
h) Advanced Pulverized Coal (APC), Double Unit

On the other hand, the technology options for power use include;

a) Compact fluorescent lamp (CFL)
b) Linear fluorescent lamp (LF)

National Designated Entity (NDE) of CTCN

Department of Environment (DoE) of the Ministry of Environment, Forest and Climate Change (MoEFCC) is the National Designated Entity (NDE) of Climate Technology Centre & Network (CTCN) in Bangladesh. As of January 2019, 06 Technical Assistance requests, focusing on adaptation and mitigation have been submitted to CTCN from Bangladesh, through the NDE. Sustainable & Renewable Energy Development Authority (SREDA), Bangladesh Water Development Board (BWDB) and Palli Karma-Sahayak Foundation (PKSF) are the proponents of these sub-national and national level Technical Assistance.

Table 19: Technical Assistance of CTCN to Bangladesh (as of January 2019)

Requested Technical Assistance (TA)	Date of Submission	Theme	Request Proponent
Saline water purification for households and low-cost durable housing technology for coastal areas of Bangladesh	12 Sep 2016	Adaptation	PKSF with technical assistance from Korea
Technology for Monitoring & Assessment of Climate Change Impact on Geomorphology in the Coastal Areas of Bangladesh	13 Oct 2016	Adaptation	Bangladesh Water Development Board (BWDB)
Development of a certification course for energy managers and energy auditors of Bangladesh	4 May 2017	Mitigation	SREDA
TA Support to formulate a National Agro-forestry Policy of Bangladesh		Mitigation	
TA for Enhancing longer lead-time flood forecasting and strengthened community dissemination in Bangladesh"		Adaptation	Bangladesh Water Development Board (BWDB)
Study of scope of co-generation for energy efficiency improvement		Mitigation	

The government organizations, INGO/NGOs, CBOs and farmers introduced different adaptation technologies/ options in different sectors in the coastal region. The 'Deltas, Vulnerability and Climate Change: Migration and Adaptation (DECCMA)' project under the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA) programme identified 85 different current adaptations measures for crop agriculture on the coast (Mondal et al., 2016). Of the total, 53 adaptation options are infrastructural, and 31 options are socio-economical. The infrastructural adaptations mainly include polders/ embankment, cyclone shelters, an irrigation channel, and drainage infrastructure. The infrastructural adaptation in the coast addresses both water and agriculture sector/sub-sectors. In addition, stress (salinity, flood, drought and cold) tolerant varieties, changes in cropping pattern, integrated farming practices, access to information, early warning system and innovative technologies, such as floating and hanging gardens, are being practiced in the coastal region. The following table 20 provides a list of climate-related stress-tolerant rice varieties being practiced in Bangladesh. However, all saline tolerant rice varieties and some flood and drought tolerant varieties may be practiced in the coastal zone (MoEFCC, 2018).

Table 20: Climate Related Stress Tolerant Rice Varieties Developed by the BRRI and BINA

Climate Related Stress	Climate Tolerant Rice Varity	Growth Duration (days)	Average Yield (Ton/Ha)
Flood (submergence)	BRRI dhan 51	142-154	4
	BRRI dhan 52	145-155	4.5
Salinity in soil, surface and ground water	BRRI dhan 40	145	4.5
	BRRI dhan 41	148	4.5
	BRRI dhan 47	152	6.0
	BINA-8	130-135	5.0
	BRRI dhan 53	140	5.0
	BRRI dhan 54	140	5.0
	BRRI dhan 61	150	6.3
	BRRI dhan 67	143	6.0
	BRRI dhan 73	120-125	6.1
	BRRI dhan 81[38]	140-145	6.0- 6.5
Drought	BRRI dhan 42	100	3.5
	BRRI dhan 43	100	3.5
	BRRI dhan 55 (also saline and cold tolerant)	145	7.0
	BRRI dhan 56	110	4.5
	BRRI dhan 57	100	4.0
	BRRI dhan 65	99	3.5
	BRRI dhan 66	113	4.5
	BRRI dhan 71	115	5.5
	BRRI dhan 76	153	4.5
Cold/low temperature	BRRI 36	140	5.0

Some other large, medium and small-scale adaptation technologies/options being practiced in the coastal areas can be seen in the following table 21:

38 http://dhcrop.bsmrau.net/brri-dhan-81/ accessed on 28 May 2019

Table 21: Large, Medium and Small-Scale Adaptation Technologies in Coastal Areas

Challenges	Existing Coping Strategies
High water level, riverbank erosion or breaching of the embankment.	• Plant timber trees. • Fast growing and early growing crop varieties. Kitchen gardening. • Tree plantation needs to be done on both sides of the embankment.
Salinity	• In rainy season they cultivate paddy in shrimp gher/farm. • Cultivate saline tolerant rice and fish varieties. • Growing vegetables in raised beds • Cultivate paddy and shrimp alternatively. • Shrimp cultivation at distances far from homestead. • Cultivate the land by re-excavation of canal and pond.
Cyclone and tidal surge	• Coastal Afforestation or Green belt to protect from cyclone and storm surge damage • Plant timber trees. • Fast growing and early growing crop varieties.
Floods and water logging	• Water drainage and re-excavation of canal. • Submergence tolerant varieties • Rural to urban migration for job search/employment • Embankment/polders to avoid flood damage • Raising plinth height of infrastructure e.g. latrine, tube wells etc.
Lack of drinking water	• Rain water harvesting • Pond protection/conservation • Pond Sand Filter (PSF)
Drought	• Excavate and re-excavate pond.

(MoEFCC, 2018)

Strengthening individual and institutional capacity through training, networking and knowledge management in agriculture and water sector is also being practiced. For example, Disaster and Climate Risk Management (DCRM) Project under the Comprehensive Disaster Management Programme (CDMP) of the Government of Bangladesh established 156 Farmers Field Schools (FFS) in flood, drought, flash flood, and coastal zone. Of which 48 schools were in the coastal region. This project organized a series of training for the farmers of each FFS. The project also identified and supported the implementation of at least 27 adaptation options including cultivation of saline tolerant varieties, conservation of freshwater in mini ponds, drip irrigation, homestead gardening and so on.

3.4.4 Capacity Building

To meet the challenge of climate change, the capacity of government ministries and agencies, civil society and the private sector will be strengthened. This pillar is tasked to:

- Review and revise, where appropriate, all government policies (sector by sector) to ensure that they take full account of climate change and its impacts.

- Mainstream climate change in national, sectoral and spatial development planning (in ministries and agencies, local government, the private sector, civil society, and communities) and ensure that impacts on vulnerable groups and women are prioritized in plans.
- Build the capacity of key government ministries and agencies to take forward climate change adaptation (e.g., Ministry of Food and Disaster Management, Bangladesh Water Development Board, Local Government Engineering Department; National Agricultural Research System, the health system, the Ministry of Women's and Children's Affairs).
- Build the capacity of the government to undertake international and regional negotiations on climate change. Regional and international cooperation is essential in order to build the necessary capacity and resilience.
- Build the capacity of the government, civil society and the private sector on carbon financing to access various global climate funds city (MoEF, 2009a)

NDC of Bangladesh also identified 'Capacity Building at Individual and institutional level to plan and implement adaptation programmes and projects in the country' as one of the adaptation priorities for Bangladesh. And one-tenth key adaptation measure mentioned in the INDC is 'Policy and institutional capacity building'.

NAPA, 2005 suggested 'Capacity building for integrating climate change in planning, designing of infrastructure, conflict management and land water zoning for water management institutions' as a future adaptation strategy. It also suggested to include climate change issues in the curriculum at the secondary and tertiary educational institution.

National Educational Policy, 2010 mentioned the inclusion of climate change issue in the compulsory syllabus at primary level, and the scope of higher education will include climate change as a subject.

General Economic Division (GED) of Planning Commission has developed 'Capacity Building Strategy for Climate Mainstreaming: A Strategy for Public Sector Planning Professionals'. The purpose of the strategy is to increase Planning Commission's capacity to integrate poverty, climate change and environmental considerations into national development planning and budgeting processes in order to benefit the poor and enable sustainable economic development.

Against the backdrop, the country's capacities at individual, institutional and systemic levels to implement the Rio Conventions, Bangladesh undertook the National Capacity Self-Assessment (NCSA) initiative in 2007 and assessed the capacity needs and prepare a capacity development action plan for sustainable environmental governance. In the NCSA process, synergies among the Rio Conventions were done with a view to mainstreaming/interfacing capacity needs and action plans within these Conventions, namely UNFCCC, CBD, and UNCCD. The identified PEIs under synergy/cross-cutting thematic area are:

- building capacity to implement RCs,
- broadening the knowledge of scientific and modern technology;
- promotion of education, training and public awareness; inventories, monitoring, and systematic observations;
- poverty eradication;
- sustainable development and environmental security;
- research and impact assessment; information, knowledge and data management; report and monitoring;
- planning, policy development, and reform of legal frameworks;
- public participation;
- international cooperation; and
- utilization of funds within the limited resources

Topic 3.5
Implementation Of UNFCCC

3.5.1 National Communications under UNFCCC

Bangladesh became a Party to the UN Framework Convention on Climate Change (UNFCCC) after its ratification in March 1994. Upon ratification, Bangladesh decisively committed itself to pursue coordinated efforts to reduce climate change impacts on the most vulnerable of its population and to take appropriate actions on mitigation while continuing to advance national economic development. Article 4, paragraph 1, and Article 12, paragraph 1, of the UNFCCC, requests that the Parties to the Convention periodically provide information to the Conference of Parties (COP) on sources and sinks of greenhouse gases (GHGs), mitigation measures, vulnerability to climate change, adaptation measures and programmes undertaken.

National Communication (NC) is a reflection of aggregate adaptation and mitigation actions taken by a country to address climate change. The reports have been prepared and submitted by many parties, including the Non-Annex 1 countries. Bangladesh prepared and submitted its Initial National Communication (INC) in 2002, and its Second National Communication (SNC) in 2012. Third National Communication (TNC) has been submitted to the UNFCCC in 2018.

Initial National Communication 2002

As a part of the global obligation under the UNFCCC, the Government of Bangladesh submitted its Initial National Communication in 2002 in which the focus was on emission inventory and the impact and vulnerability of climate change on different sectors and biophysical systems for the base year 1994.

Second National Communication (SNC) 2012

In the Second National Communication (SNC), submitted in 2012 for the base year 2005, emission inventory as well as impact, vulnerability, adaptation, and mitigation issues were elaborated on.

Third National Communication (TNC) 2018

Third National Communication, prepared in 2018, provides an updated status of national circumstances along with greenhouse gas (GHG) inventory for 2006-2012 of different sectors, and measures to facilitate adequate adaptation and appropriate mitigation. The Government of Bangladesh (GoB), represented by the Ministry of Environment, Forest and Climate Change (MoEFCC), and its operational arm, the Department of Environment (DoE) has prepared the Third National Communication (TNC) which contains the following activity status:

Activity 1: National Circumstances;
Activity 2: Greenhouse Gas (GHG) Inventory;
Activity 3: Programmes containing measures to mitigate climate change;
Activity 4: Programmes analyzing vulnerability to climate change and containing measures to facilitate adaptation to climate change; and
Activity 5: Other information considered relevant to the achievement of the objectives of the UNFCCC/ crosscutting issues.

TNC has generated baseline data required for the assessment of climate change risks and vulnerability and impacts and adaptation options. It has also resulted in a comprehensive vulnerability and risks assessment for various sectors, in particular, agriculture, water resources, forestry, fisheries, livestock, industries and infrastructure sectors.

Topic 3.6
Dealing Climate Change: Good Practices in Bangladesh

The material of this session is provided as a separate document titled
“Good Practices and Innovations in Implementing Rio Conventions In Bangladesh”.

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Notes on Module-3 of the Training Manual

MODULE-4

United Nations Convention To Combat Desertification (**UNCCD**)

Overview of the MODULE-4

 Objectives	This module on 'United Nations Conventions to Combat Desertification (UNCCD)' intends to ○ Provide a fundamental understanding on the Convention ○ Gain knowledge on the CCD related MEAs, Protocols and synergies among the Agreements ○ Provide guidance on key aspects for the preparedness of Bangladesh as a Party ○ Provide aspects of implementation framework of the Convention ○ Inform the best practices and innovations in Bangladesh relevant to CCD
 Participants	The training program targets the government officials from the concerned ministries, line agencies, departments, trainers and officials of the public training institutions.
 Training Methodology	The module intends to enhance knowledge and skills of the government officials and national trainers, which is required for developing and implementing the MEAs at the national level. The module will encourage participants to think creatively, absorb quickly by utilizing the contemporary adult learning methodologies, including • Presentations and discussions • Interactive lectures • Sharing the experiences • Feedback from the participants • Evaluation and upgradation
 Resource Persons	Training will be conducted by the renowned resource person(s) having related expertise on the subject matters.

 Expected Learning Outcomes	After successful completion of the training, the participants will be able to understand: ○ Development and operations of UNCCD ○ Obligations and policy responses related to the Conventions ○ The implementation framework of UNCCD ○ Progress of Bangladesh in implementing the UNCCD ○ Good practices related to CCD in Bangladesh
 Topics	4.1 Land Degradation and Drought 4.2 Institutional Arrangement 4.3 COP Decision, Obligation, Strategic Framework, Implementation 4.4 Synergies with CBD, UNFCCC and SDGs 4.5 Overview of Land Degradation in Bangladesh 4.6 Bangladesh's Response 4.7 Combating Land Degradation: Good Practices in Bangladesh
 Helpful Tips for Participants	In order to derive maximum benefits from the training course, please note the following: • Identify areas that you are interested in and see how the deliberations address the issues. • If you want information about certain issues, feel free to share with the resource persons. • Use this forum to share your experiences and opinions with other participants.
 Logistics	• Supplies and equipment (whiteboard, multimedia, sound system, computer, wi-fi etc.) • Stationeries (markers, paper etc.) • Handouts (Training Module)
 Duration	4.5 hours

Topic 4.1
Land Degradation and Drought

There is no serious threat of desertification in Bangladesh. However, Bangladesh is suffering from the land degradation and seasonal droughts at parts of the country. As such, in preparing the module, we have considered only the drought and the land degradation issues under this convention. The term 'degradation' or 'desertification' refers to irreversible decline in the 'biological potential' of the land. According to UNCCD,

> **Land Degradation** means reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as: a. soil erosion caused by wind and/or water, b. deterioration of the physical, chemical and biological or economic properties of soil and c. long-term loss of natural vegetation.
>
> **Desertification** is not the natural expansion of existing deserts but the degradation of land in arid, semi-arid, and dry sub-humid areas. It is a gradual process of soil productivity loss and the thinning out of the vegetative cover because of human activities and climatic variations such as prolonged droughts and floods. What is alarming is that though the land's topsoil, if mistreated, can be blown and washed away in a few seasons, it takes centuries to build up. Among human causal factors are overcultivation, overgrazing, deforestation, and poor irrigation practices. Such overexploitation is generally caused by economic and social pressure, ignorance, war, and drought.
>
> **Drought** refers the naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems. A drought can be defined in several ways. A meteorological drought, for example, occurs when rains do not transpire, whereas a hydrological drought occurs when a lack of rainfall continues long enough to empty rivers and lower water tables. Agricultural drought begins when a lack of water kills crops and livestock, affecting locals' survival.

It has been reported that water crisis is creating a dangerously threatening situation for biodiversity in the northern region of Bangladesh as the rivers in the region are gradually dying. However, dredging the rivers in the northern part of the country is needed as they are in dying condition due to siltation and the impact of the Farakka barrage in the upper riparian country of the river Padma. The unilateral withdrawal of water through upper part of the Padma has left its impact on the rivers flowing across the northern region. About 50 rivers are on the point of dying. Experts believe that within a short period, the existences of these rivers will be vanished (Department of Environment, 2015).

4.1.1 Land and Land Use

Land means the terrestrial bio-productive system that comprises soil, vegetation, other biota, and the ecological and hydrological processes that operate within the system. Land is a vital resource for producing food it also provides means for conserving of biodiversity, regulating hydrological regimes, cycling soil nutrients, and sequestering carbon. Unquestionably, productive land and fertile soil is the most significant natural resource or asset. Proper care of this resource can protect and maximize the services land provides to mankind while, inappropriate use and management can degrade or destroy this resource.

The total area of the country is about 147,570 km^2 of which 138,125 km^2 (93.59% of total area) is the total land area. This land is occupied by agriculture, scattered homesteads, urban centers, industries, educational institutions, inhabited lands and other non-agricultural purposes.

Total agricultural land reduced 1,126,750 ha during 34 year-time (1976-2010) with a yearly average loss of 33,140 ha. Average yearly agricultural land losses were 0.18%, 0.44% and 0.25% during 1976-2000, 2000-2010 and 1976-2010, respectively. Major degraded land area is about 1.06 million ha caused by salinity, fertility declined soil is 8.0 m ha, 1.7 m ha area in hilly areas that more susceptible to degradation. Total agricultural land of Bangladesh in 1976 was 13,303,654 ha which constituted 91.83% of the country's total land area (Figure 24). It decreased to 12,742,274 ha in 2000 with yearly loss 23,391 ha and further declined to 12,176,904 ha in 2010 with yearly loss 56,537 ha.

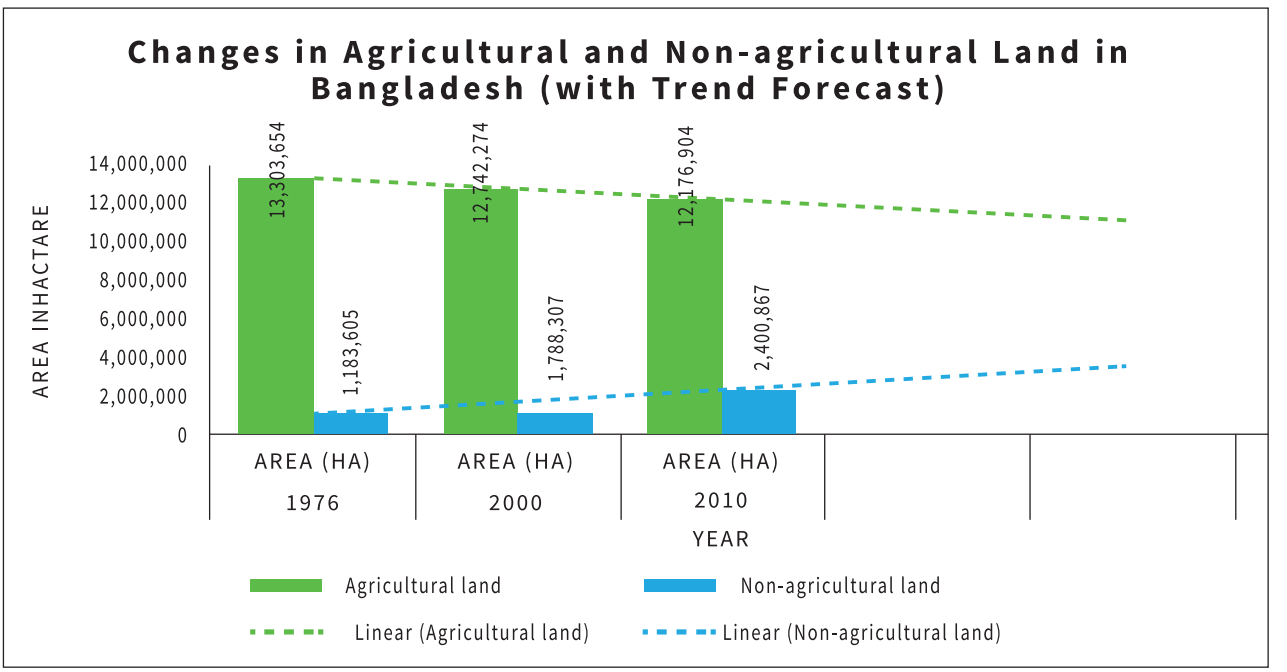

Figure 24: Changes in agricultural and non-agricultural land in Bangladesh

Table 22: Change in land type in Bangladesh (Hasan et. al. 2013)

	1976		2000		2010	
Land Type	Area (ha)	% of total	Area (ha)	% of total	Area (ha)	% of total
Agricultural land	13,303,654	91.83	12,742,274	87.69	12,176,904	83.53
Non-agricultural land	1,183,605	8.17	1,788,307	12.31	2,400,867	16.47
Total	14,487,259	100.0	14,530,581	100.0	14,577,771	100.0

4.1.2 Land Degradation

Land degradation is both a natural and human-induced process. It existed before the human race populated the earth and will continue to exist. By its definition, land degradation occurs when the resilience and adaptive capacity of the land is compromised. Land degradation is a human-induced phenomenon that cannot be caused by natural processes alone. It decreases the capacity of the land system as managed to meet its user demands; and threatens the long-term biological and/or economic resilience and adaptive capacity of the ecosystem.

There are ten forms of land degradation:

a. Water erosion
b. Bank erosion
c. Soil fertility decline
d. Water logging
e. Salinization
f. Pan formation
g. Acidification
h. Lowering of water table
i. Active flood plain
j. Deforestation

Components of Land Degradation

There are a number of interrelated land degradation components, all of which may contribute to a decline in agricultural production. The most important are: ·

- Soil degradation - decline in the productive capacity of the soil as a consequence of soil erosion and changes in the hydrological, biological, chemical and physical properties of the soil.
- Vegetation degradation - decline in the quantity and/or quality of the natural biomass and decrease in the vegetative ground cover.
- Water degradation - decline in the quantity and/or quality of both surface and ground water resources.
- Climate deterioration - changes in the micro and macro climatic conditions that increase the risk of crop failure.
- Losses to urban/industrial development - decline in the total area of land used, or with potential, for agricultural production as a result of arable land being converted to urban, industrial and infrastructure uses.
- Water erosion is the most important type of soil degradation occupying 56% of the worldwide area affected by human-induced soil degradation and mainly occurring in Asia. The area affected by wind erosion occupies 28% of the degraded terrain, mainly occurring in Asia and Africa.
- Loss of nutrients and salinization (mainly in Asia) are important types of chemical soil deterioration, whereas compaction is by far the most important type of physical soil degradation.

Topic 4.2
Overview of Land Degradation in Bangladesh

4.2.1 National Context

According to Bangladesh Statistical Bureau 2011, Bangladesh has a total land surface of 14.84 million hectares that includes 8.52 million hectares of agricultural land. Current population size of the country is 167million[1] which is projected to grow 201.95 million by the year 2050. The per capita availability of land for agricultural production is about 0.06 hectares. Agricultural land is declining at an alarming rate as a consequence of increase in demand for non-agricultural uses e.g., urbanization, industrial estate, brickfields, roads and highway and other infrastructural growth. Hasan et. al, (2013) estimated that during the period 2000 and 2010, on an average Bangladesh lost about 68,760 ha of cultivable land annually. Land degradation is occurring due to both natural and anthropogenic causes. Degradation caused by the nature is often balanced by formations of new land through erosion and accretion while deterioration of soil quality and land loss due to human intervention may not always be reversible. Therefore, identifying and updating the land degradation issues and its underlying factors is very crucial for sustainable management of the land resources of the country.

Agricultural extensification, intensification and the increase in irrigated areas have led to a number of environmental problems, viz. loss of biodiversity through the conversion of forest land into agricultural land, unsustainable use of chemical inputs for agricultural production, and abandonment of many indigenous crop varieties in favor of high yielding varieties (HYVs) leading to irreversible loss of the country's genetic resources. The continuous cultivation of rice in same piece of land is resulting in declining yields and soil nutrient (sulphur and zinc) contents. About 65% of the net cultivable area suffers from shortage of organic matter contents. The increased use of agrochemicals caused pollution of surface and ground water.

Among many environmental issues that Bangladesh faces today, land degradation due to aridity and droughts has resulted to considerable economic losses and human sufferings. It is apprehended that desertification process may have started in some of the most aridity prone areas. Land degradation in the coastal areas is characterized by water logging with its adverse impact on productivity. Salinization caused by the expanding shrimp farming and sea level rise is affecting a considerable expanse of landmass along the coasts. The coastal belt is also severely affected by the destruction/disappearance of mangroves.

The salinity level of the soil in some of the coastal areas has gradually gone up due to the shrinking flow of water along the major rivers with consequent reduction in crop yields. Moreover, due to frequent cyclones, tidal surges, floods etc., there is serious deposition of coarse sand along with increasing soil salinity, resulting in severe land degradation in the coast. All these phenomenons indicate the inevitable fact that a slow but discernable process of land degradation is in progress in the country.

1 http://worldpopulationreview.com/countries/bangladesh-population/ accessed on 10 may 2019

4.2.2 Main Causes of Land Degradation in Bangladesh

Both natural and anthropogenic factors cause land degradation. Some are mentioned below:

Natural Causes	Anthropogenic Causes	
• drought • flood • water logging • soil salinity • soil acidification	• climate change • ecosystem destruction • unplanned urbanization • over-cultivation/ exploitation • stone and sand extraction • hill cutting • industrial pollution	• brickfields in agriculture land • irrespective development of infrastructures • deforestation tobacco cultivation • shifting cultivation (jhum) • use of chemical inputs

4.2.3 Consequences of Land Degradation in Bangladesh

The impact of land degradation in Bangladesh is very evident.

- For example, the massive assault on the Sundarbans, Madhupur forest, forest lands of Sylhet and Chittagong has already initiated drought, and desertification process of the already fragile land (Khan 2013).
- Bangladesh is one of the countries in South Asia facing agricultural land losses. It accounts for 75% of the total agricultural land degradation which is 140 million hectares. The cost of this loss is at least US$10 billion annually.
- Salinity intrusion has created a major problem particularly in the coastal zone of Bangladesh. During the last three decades, about 0.17 million hectares of land was newly affected by various degrees of salinity (Khan 2013).

4.2.4 Extent of Land Degradation in Bangladesh

Bangladesh has a total land surface of 14.84 million hectares including 8.52 million hectares of agricultural land. The per capita availability of land for agricultural production is about 0.06 hectares. Moreover, due to population growth, this share of land per capita is shrinking every year making the resource base for agriculture, forest and wetlands more vulnerable and marginalized. The following table 23 shows different types of land degradation and their extent in Bangladesh.

Table 23: Different types of land degradation and their extent in Bangladesh (DoE 2015)

Types of land degradation	Areas (in Mha) affected by different degrees of degradation				Total area (Mha)
	Light	Moderate	Strong	Extreme	
Water erosion	0:1	0.3	1.3		1.7
Bank erosion	-	1.7			1.7
Soil fertility decline	3.8	4.2			8.0
P deficient (for HYV rice)	5.3	3.2			8.5
P deficient (for Upland crops)	3.1	2.5			5.6
K deficient (for HYV rice)	4.0	3.4			7.4
K deficient (for Upland crops)	2.1	5.4			7.5

S deficient (for HYV rice)	4.4	3.3			7.7
S deficient (for Upland crops)	4.1	4.6			8.7
Soil organic matter depletion	1.94	1.56	4.05		7.77
Water logging	0.69	0.008			0.7
Salinization	0.29	0.43	0.12		1.06
Pan formation		2.82			2.82
Acidification		0.06			0.006
Lowering of water table					
Active floord plain					1.53
Deforestation		0 3		-	0.3
Barind and Madhupur tract					0.773

This is mainly due to conversion of land into urban, peri-urban, industrial uses, and construction of roads, embankment. Competition between forest and agriculture, fisheries and agriculture are also responsible for some conversions (e.g., Chokoria Sundarban of Cox's Bazar district and its adjacent areas which used to be mangrove forest is now shrimp farms). Bangladesh Agricultural Research Institute (BARI) recorded soil loss of 2.0 to 4.7 ton per hectare per year in different parts of the country. Soil loss manifests depletion of a significant amount of nutrients from the top layer causing tremendous soil degradation. For example, topsoil loss in Chittagong Hill Districts is very high (Table 24). Topsoil loss in other parts of the country is also high.

Table 24: Soil loss from agricultural land use at different slopes due to jhum cultivation (Ahsan 2010).

Slope	Land use	Soil loss ($t^{-1}ha^{-1}year^{-1}$)
Steep slope	*Jhum*	39.70
	Local Jhum paddy	13.54
	BRRIdhan 26	12.50
	BRRIdhan 27	11.60
	Jhum hedgerow	8.85
Moderate slope	*Jhum*	35.05
	Local Jhum paddy	13.72
	BRRIdhan 27	11.95
	BRRIdhan 26	11.63
	Jhum hedgerow	9.85
Gentle slope	*Jhum*	32.48
	Jhum hedgerow	16.90
	Local Jhum paddy	11.52
	BRRIdhan 26	8.35
	BRRIdhan 27	4.7

4.2.5 Land and Population

Because of population increase, per-capita land availability is decreasing in the country (Figure 25). Conversion of agriculture land to other uses is a key reason for the reduction of per-capita arable land of the country. Bangladesh is losing its cropland area, also due to lack of proper land management. Agricultural and land development policy is the crux of land use change in Bangladesh, which has one of the lowest land-person ratios of 0.12 acres (World Bank 2017).

Two significantly prominent phenomena driving country's ever decreasing land resources include the high growth rate of population engulfing precious land for settlement and scarcity for ever-increasing demand for food. As a result, the land use pattern of the country is changing at a high rate. Every year the country is losing 0.15-1% of arable land due to population growth and infrastructure development. Land use change is driven by a combination of socio-economic factors, such as- income levels, infrastructure and demographic structure, land tenure, subsidies, nature protection, soil, and climate characteristics. These land use drivers are the forces behind the change in land use. According to Bangladesh Bureau of Statistics (BBS) in 2011 There are about 8.52 million hectares of arable land available in the country.

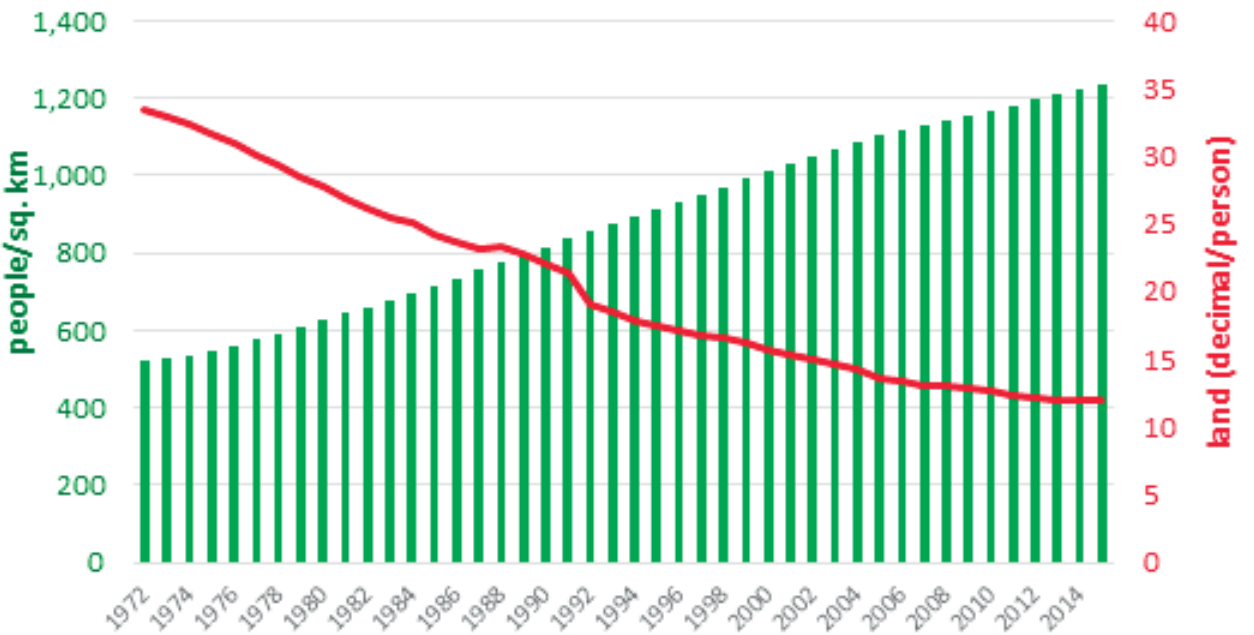

Figure 25: Population growth vs. per-capita agriculture land (World Bank, 2017)

4.2.6 Cost of Land Degradation

About 6.0 Mha, or 43% of the total geographical area is affected by various forms and degree of degradation. About one fourth of the total cultivable land is affected by drought in every year with different intensity. The recovery of such land depends upon its resilience, which, however, may be lost completely if the land is not treated in time with care. Frequent droughts, through its short-lived but recurrent stress, can aggravate the adverse impact and, if not checked properly, can interfere with the natural capacity of land to recover and advance the process of desertification. Agricultural intensification and the increase in irrigated area have led to a number of environmental problems i.e., loss of bio-diversity through the conversion of forest land into agricultural land; abandonment of many indigenous crop varieties in favour of HYV's leading to irreversible loss of the country's genetic resources; depletion of soil nutrients and organic matter due to intensive cropping;

and deprivation of soil from organic content due to use of crop residue as fuel (DoE 2015). The following table 25 shows the summary of estimates of the cost of land degradation in Bangladesh (DoE 2015).

Table 25: Estimated Cost of Land Degradation in Bangladesh (DoE 2015)

Nature of degradation	Physical quantity of lost output (in mt/yr)	Taka equivalent / yr (million)	Cost (million) US$/yr
Water erosion	Cereal production loss = 1.06 Nutrient loss = 1.44	6613.84 25576.46	140.72 544.18
Fertility decline	Cereal production loss = 4.27 Addl. Inputs = 1.22	26641.48 21668.88	566.84 461.04
Salinization	Total production loss = 4.42	27577.251	586.75
Acidification	Total production loss = 0.09	561.51	11.95

Other environmental degradation includes loss of wetland habitats through abstraction and drainage resulting in depletion of aquatic fauna and flora and reduction in water availability to the rural population, increased use of agro-chemicals raising the pollution potentials of surface and ground water. Issues from desertification process are:

- Deterioration of the natural resources adversely affecting the socio-economic condition and livelihood support systems;
- Reduction of irrigation potential;
- Diminishing of the food security base of human beings and livestock;
- Scarcity of drinking water extraction and depletion of ground water, interference with spacing of tube well, including hand tube well, shallow and deep tube well;
- Health and nutrition status of the population, arsenic contamination in ground water, contamination due to disposal of waste and inadequate sanitation;
- Reduced availability of biomass for fuel;
- Loss of bio-diversity; and
- Impoverishment, indebtedness and distress sale of assets of production

Topic 4.3
Introduction to UN Convention To Combat Desertification (UNCCD)

4.3.1 Genesis

The international community has long recognized that land degradation or desertification is a major economic, social and environmental problem in all regions of the world. In 1977, the United Nations Conference on Desertification (UNCOD) adopted a Plan of Action to Combat Desertification (PACD). Despite this and other efforts, the United Nations Environment Programme (UNEP) concluded in their findings in 1991 that the problem of land degradation in arid, semi-arid and dry sub-humid areas had intensified. As a result, the question of how to tackle desertification was still a major concern for the United Nations Conference on Environment and Development (UNCED), which was held in Rio de Janeiro in 1992. The Rio Conference called on the United Nations General Assembly to establish an Intergovernmental Negotiating Committee to prepare a Convention to Combat Desertification, particularly in Africa by June 1994. In December 1992, the General Assembly agreed and adopted resolution 47/188 on this matter. The Committee completed its negotiations in five sessions. The Convention was adopted in Paris on 17 June 1994 and entered into force on 26 December 1996. The Conference of the Parties (COP), which is the Convention's supreme governing body, held its first session in October 1997 in Rome, Italy. At the Eighth Conference of the Parties in Madrid in September 2007, the UNCCD entered a new phase with the adoption of the 10-year strategic plan and framework to enhance the implementation of the Convention (UNCCD, 2017a). The Convention entered into force in December 1996. Currently, the UNCCD has 197 Parties. The non-signatory States have the option of acceding, accepting or approving the Convention at any time.

4.3.2 Objectives

The objective of this Convention is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa, through effective action at all levels, supported by international cooperation and partnership arrangements, in the framework of an integrated approach which is consistent with Agenda 21, with a view to contributing to the achievement of sustainable development in affected areas.

4.3.3 Obligations of UNCCD

All countries are not equally affected by desertification or land degradation. So, the roles and responsibility may vary based on the level of impact or geographic location of a country. On the other hand, all countries do not have a similar level of technical or financial capacity. Variation in-country capacity may offer them various level of obligations. Different countries have a different level or type of obligations to the UNCCD.

General Obligations: General obligations of the countries that have ratified the UNCCD shall adopt an integrated approach to address the physical, biological and socio-economic aspects of the processes of desertification and drought. A major component of developing such a strategy is to give due attention to the situation of countries facing desertification regarding international trade, marketing arrangements and debt with a view to establishing an enabling international economic environment conducive to the promotion of sustainable development.

To accomplish this goal, Parties will need to promote poverty eradication, cooperate with countries affected by desertification, strengthen international cooperation through intergovernmental organizations and enhance foreign assistance. Affected developing country Parties are eligible for assistance in the implementation of the Convention. These general obligations are applicable to all Parties of the UNCCD.

Obligations of Affected Country Parties: In addition to the general obligations, affected countries obligations includes following as mentioned in Article 5:

Affected Country Parties to:

a. give due priority to combating desertification and mitigating the effects of drought, and allocate adequate resources in accordance with their circumstances and capabilities;
b. take strategies and priorities, within the framework of sustainable development plans and/or policies, to combat desertification and mitigate the effects of drought;
c. address the underlying causes of desertification and pay special attention to the socioeconomic factors contributing to desertification processes;
d. promote awareness and facilitate the participation of local populations, particularly women and youth, with the support of nongovernmental organizations, in efforts to combat desertification and mitigate the effects of drought; and
e. provide an enabling environment by strengthening, as appropriate, relevant existing legislation and, where legislation does not exist, enacting new laws and establishing long-term policies and action programmes.

As a member of affected Country Parties, the obligations mentioned above need to be addressed by Bangladesh.

4.3.4 Institutional Arrangement

The Secretariat

There is a permanent Secretariat in Bonn, Germany. The Secretariat administers the UNCCD, organize meetings, coordinates reporting, and supports the implementation of the Convention.

Conference of the Parties (COP)

The Conference of the Parties (COP) of UNCCD is the supreme decision-making body of the Convention. The first five sessions of the COP were held annually from 1997 to 2001. Since 2001, the COP sessions are held on a biennial basis. The two subsidiary bodies, the Committee on Science and Technology and the Committee for the Review of the Implementation of the Convention (CRIC) (whose first session was held in 2002) are held annually. It reviews the implementation of the Convention; promotes and facilitates the exchange of information; approves the budget and activity programmes of its subsidiary bodies; cooperates with international organizations, NGOs & other related conventions.

During every COP and also once between meetings the Committee for the Review of the Convention (CRIC) convenes. Representatives from different regions review progress in implementing the UNCCD. The CRIC reports outcomes and suggestions at the following COP.

Committee of the Whole (CoW)

The Committee of the Whole (CoW) is an ad-hoc body of the Conference of the Parties of the UNCCD. The CoW is set up by the COP to facilitate discussions on specific issues during Conference sessions. The CoW is open to all delegates. The CoW is headed by a Chair who is elected by the COP and serves as a member of the COP

Bureau for the duration of the existence of the CoW of the session in question. CoW reports recommendations to the COP plenary for further consideration and possible adoption.

Committee for the Review of the Implementation of the Convention (CRIC)

The Committee for the Review of the Implementation of the Convention (CRIC) is a standing subsidiary body of the COP. CRIC assists the COP in the review of the implementation of the Convention under the authority and guidance of the COP and as an integral part of the Performance Review and Assessment of Implementation System.

The mandate of the CRIC for Inter-sessional sessions

The CRIC focuses on the assessment of implementation by Parties and other reporting entities through, inter alia-

1. Undertaking an assessment of implementation against performance indicators every two years and against impact indicators every four years;
2. Disseminating best practices on the implementation of the Convention,
3. Reviewing financial flows for the implementation of the Convention;
4. Giving recommendations to Convention's institutions and subsidiary bodies on priority works;

The mandate of the CRIC for Sessional Sessions

The CRIC assists the COP in -

- Review report at sessions held between ordinary sessions of the COP;
- Review the multi-year work plan and performance of the Convention's institutions and subsidiary bodies;
- Review the collaboration with the GEF;
- Provide advice on issues as requested by the CST;

Committee on Science and Technology (CST)

The Committee on Science and Technology (CST) provides the COP with information and advice on scientific and technological matters related to combating desertification and mitigating the effects of drought. Consisting of Government representatives, the committee identifies priorities for research, and recommend ways of strengthening cooperation among researchers. The Convention encourages the protection of traditional knowledge that is conducive to sustainable development while facilitating the exchange of the latest data, information, and technology through the CST.

Global Mechanism (GM)

Global Mechanism (GM) provides advisory services, promote partnerships and demonstrate innovations at the country level. It supports countries in translating the Convention into action and achieving Land Degradation Neutrality at the national level. The key mandate of the GM is to intensify the effectiveness and efficiency of existing financial mechanisms.

4.3.5 Decision Making Process of the CCD

Apart from the permanent institutional structures, some temporary ad hoc groups work during sessions of the COP such as Friends of the Chair, Contact Groups, Ad hoc Working Groups and Drafting groups (UNCCD 2015). The decision-making process of UNCCD involves all the institutional levels: i) initial recommendations are produced by the Advisory Group of Technical Experts (AGTE); ii) the recommendations suggested by the AGTE are reviewed and draft decision proposed by CST; iii) the CST passes on the recommendations and/or draft decisions to CRIC for an in-depth review; iv) CRIC places the draft recommendations/draft decisions to the COP for consideration. Recommendations and draft decisions are also sent to COP by the CoW (UNCCD 2015). Figure 26 illustrates the UNCCD decision-making process.

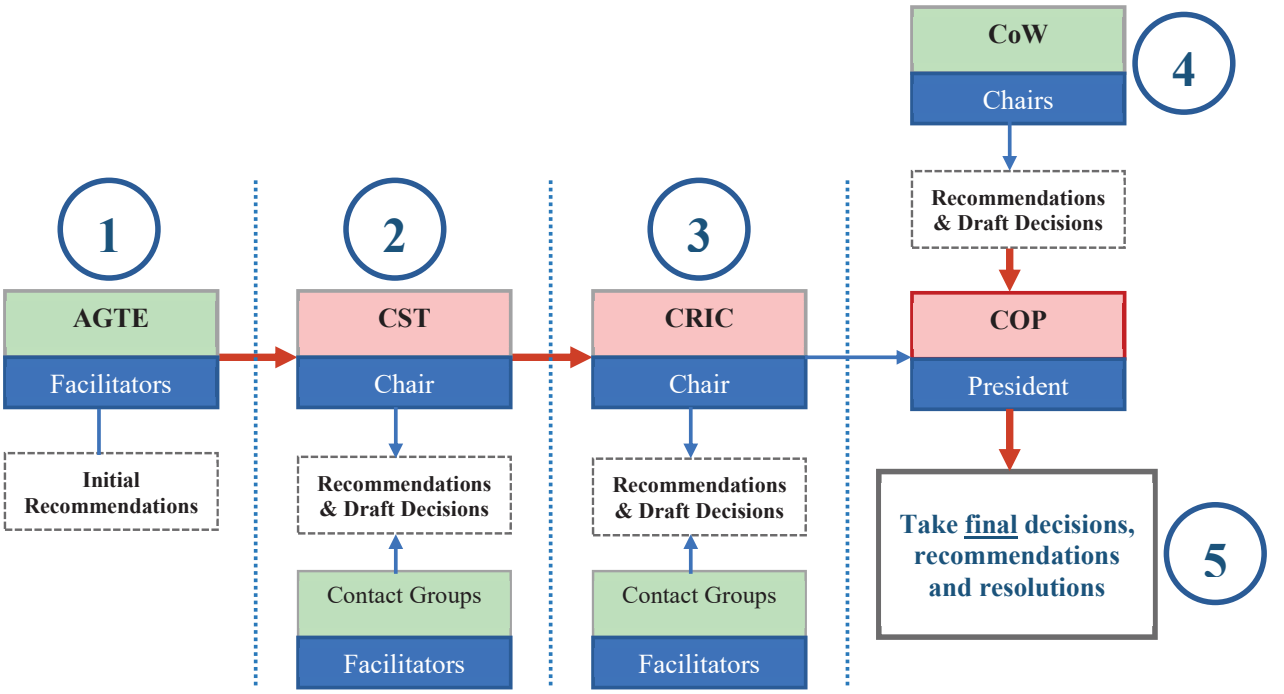

Figure 26: Decision-making Processes in the UNCCD

Topic 4.4
COP Decisions, Strategic Framework, and Implementation

4.4.1 Major COP Decisions

1. **COP 1:** The basis for networking and development of partnerships with the Governments and other partners in capacity building, to help foster the effective implementation of the Convention.
2. **COP 5:** Established the CRIC (Committee for the Review of the Implementation of the Convention) and adopted Decision 11, which calls for the development of benchmarks and indicators as part of the overall process of capacity development.
3. **COP 6:** Requested the Secretariat to promote activities to strengthen the capacity of Low Forest Cover Countries (LFCC) to Combat Desertification, Land Degradation, and Drought (DLDD). Establishment of the GEF as a financial mechanism of the UNCCD.
4. **COP 8:** The 10-year strategic plan and framework to enhance the implementation of the Convention (2008–2018).
5. **COP 10:** Prioritizes the promotion of opportunities for capacity building for the implementation of the UNCCD. The decision to establish an ad hoc advisory group of technical experts (AGTE).
6. **COP 11:** Namibia Declaration on a stronger United Nations Convention to Combat Desertification for a land degradation neutral world. Science-Policy Interface (SPI) was formulated.
7. **COP 12:** Integration of the Sustainable Development Goals and targets into the implementation of the United Nations Convention to Combat Desertification and the Intergovernmental Working Group report on land degradation neutrality.
8. **COP 13:** Scientific conceptual framework that provides the basis for understanding LDN and offers practical guidance for implementing and monitoring programmes to achieve the targets.

4.4.2 The UNCCD Strategic Framework 2018–2030

The thirteenth session of the COP (COP13) adopted the UNCCD 2018–2030 Strategic Framework. The framework was developed with five strategic objectives:

Strategic objective-1	• To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality.
Strategic objective-2	• To improve the living conditions of affected populations.
Strategic objective-3	• To mitigate, adapt to, and manage the effects of drought in order to enhance resilience of vulnerable populations and ecosystems.
Strategic objective-4	• To generate global environmental benefits through effective implementation of the UNCCD.
Strategic objective-5	• To mobilize substantial and additional financial and non-financial resources to support the implementation of the Convention by building effective partnerships at global and national level.

Acting for the accomplishment of the strategic objectives will ensure to achieve the broader objective of UNCCD.

4.4.3 Implementation Plans and other Aspects of the UNCCD

National Action Programme (NAP): Under the Decision number three of the eighth session (held in Madrid, 2007) of the Conference of the Parties (3/COP.8), the Secretariat of UNCCD formulated the 10-year strategic plan and framework to enhance the implementation of the Convention for 2008-2018. This 10-year strategic plan is known as the National Action Programmes (NAPs). It is one of the key instruments to implement the Convention. The NAPs are developed through a participatory approach involving various stakeholders, including relevant Governmental Offices, scientific institutions, and local communities. They spell out the practical steps and measures to be taken to combat desertification in specific ecosystems.

The UNCCD urges affected country Parties to align their action programmes, as well as other relevant implementation activities relating to the Convention, to the UNCCD's 10-Year Strategy. Since the adoption of the Strategy in 2007, many affected countries have started the process of aligning their national action programmes, in addition, the alignment of the sub-regional and regional action programmes has also been initiated. NAPs are often supported by Sub-Regional Action Programmes (SRAP) and Regional Action Programmes (RAP).

Performance Review and Assessment of Implementation System (PRAIS): The Performance Review and Assessment of Implementation System (PRAIS) portal is an essential reporting tool that helps Parties to the UNCCD submit their reports. The PRAIS portal is constantly updated and will continue facilitating UNCCD reporting processes. Other reporting tools, such as templates and manuals, are available to assist Parties in submitting their reports in a timely manner.

Science-Policy Interface (SPI): Complying the decision 23 of COP 11 (23/COP.11), the Science-Policy Interface (SPI) was established in 2013 to promote dialog between scientists and policy-makers on desertification, land degradation and drought (DLDD). The SPI works to deliver information, knowledge, and advice on DLDD needed to develop policies measures that ensure maintenance and enhancement of land resources and ecosystem services that flow from them.

Among the SPI members are globally renowned DLDD and political scientists. Engaging a broad range of scientific mechanisms and leveraging synergies with other scientific panels, the SPI identifies knowledge needs, selects means for addressing them and delivers results to policy-makers. The SPI packages its findings into informative and concise products. Among latest SPI publications available on the Knowledge Hub are two science-policy briefs: i) Pivotal Soil Carbon, and ii) Land in Balance, and a new report entitled Scientific Conceptual Framework for Land Degradation Neutrality.

Land Degradation Neutrality (LDN): Under the decision (ICCD/COP(13)/L.7), the thirteenth COP invited Parties to formulate voluntary targets to achieve Land Degradation Neutrality (LDN). This target of LDN is a state whereby the amount and quality of land resources necessary to support ecosystem functions and services; augment food security remains stable or increase within specified temporal and spatial scales and ecosystems. Within the UNCCD this definition is intended to apply to affected areas as defined in the text of the Convention. The concept of Land Degradation Neutrality (LDN) was first introduced as "zero net land degradation" in a proposal tabled at Rio+20. This goal or target would be achieved by-

a. managing land more sustainably, which would reduce the rate of degradation; and
b. increasing the rate of restoration of degraded land, so that the two trends converge to give a zero-net rate of land degradation.

Land degradation neutrality is considered a hybrid-scientific concept now being refined in parallel processes so that scientific analysis leads to findings that will help policymakers. The most distinctive feature of land degradation neutrality as a strategy to address land degradation is the integration of the three activities prescribed by the UNCCD (Article 1(b) of the Convention Text):

1) prevention and/ or reduction of land degradation,
2) rehabilitation of partly degraded land, and
3) reclamation of desertified land.

However, this strategy is not envisaged as a "license to degrade" or a grand compensation scheme to restore the productivity of one area of land to offset degradation that has taken place elsewhere. The LDN conceptual framework has been developed to guide countries in operationalizing this definition of LDN (UNCCD 2016). The objectives of LDN are:

- Maintaining/ improving ecosystem services
- Maintaining/ improving productivity, to enhance food security;
- Increasing resilience of the land and populations dependent on the land;
- Seeking synergies with other environmental objectives;
- Reinforcing responsible governance of land tenure.

Sustainable Land Management (SLM): In addition to various COP decision and the Obligations of the Convention, SLM is an important aspect of the UNCCD. Sustainable land management (SLM) is an integral component of any stakeholder's attempt to achieve land degradation neutrality (LDN) and Sustainable Development Goals (SDG) while ensuring ecologically responsible land management practices.

Land degradation and desertification create a global threat for fertile land and the benefits it provides to human society. Competition for the scarce resources of soil and water is further intensified by a growing world population and increased demand for alternative land management products. Every year, around 24 billion tons of fertile farmland soil worldwide is lost due to soil sealing, erosion, and desertification. On-going degradation of fertile soil needs to be halted so that the earth can provide sufficient land-based ecosystem services for the ever-increasing number of inhabitants. Preliminary studies predict huge costs of land degradation in the future and emphasize the need to invest that can reduce the loss of productive land.

SLM has great potential for the preservation and enhancement of ecosystem services in all land-use systems. Degradation of water, soil, vegetation and gas emissions contributing to climate change, can be limited by SLM practices that simultaneously conserve natural resources and increase yields.

4.4.4 Finance

Global Mechanism (GM): GM promotes actions leading to the mobilization and channeling of substantial financial resources, including for the transfer of technology, on a grant basis, and/or on concessional or other terms, to affected developing country Parties, to increase the effectiveness and efficiency of existing financial mechanisms.

Land Degradation Neutrality Fund: The LDF Fund was launched on 12 September 2017 at the 13th Conference of the Parties (COP13) to the United Nations Convention to Combat Desertification (UNCCD) in Ordos, China. The LDN Fund is a first-of-its-kind investment vehicle leveraging public money to raise private capital for sustainable land management and landscape restoration activities worldwide that contribute to the achievement of land degradation neutrality. The initial target of the fund is US$300 million (UNCCD, 2017b).

GEF Fund: Global Environment Facility (GEF) is an important avenue for exploring funding for projects related to UNCCD.

International organizations such as the UNDP, UNEP, IFAD, FAO etc. which could take up specific projects/ programmes in partnership with National Governments and funding is channeled through those organizations.

Bilateral assistance: GIZ, SIDA, DANIDA, etc.

Multilateral assistance: ADB, World Bank, etc.

Topic 4.5
Synergies of CCD with CCC, CBD and SDGs

4.5.1 UNCCD with Biodiversity and Climate Change Conventions

Climate change, biological diversity, desertification, land degradation, and drought are intricately related to the social, economic and environmental fronts. Because, these issues are closely linked, the secretariats of the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification (UNCCD) are engaged in collaborative actions.

Climate has the bearing on the biodiversity and land degradation and droughts. Accordingly, synergies are there among these conventions. National action programmes, strategies, action plans and adaptation programmes of action are the implementation tools at the national level. Action at the national level represents an important opportunity to establish synergy, coherent policy instruments and cost-effective ways for implementation.

4.5.2 Land Degradation and SDGs

The United Nations has set Sustainable Development Goals (SDGs) to achieve unified development across the world. There is a total of 17 goals in the SDGs (UN 2015). Amongst the SDGs, the Goal-15 directly links with the UNCCD (Figure 27). Target # 15.3 of the goal focuses on combating desertification, restoring degraded land and LDN and Indicator#15.3.1 will keep an account of the proportion of degraded land over total land area, as shown below:

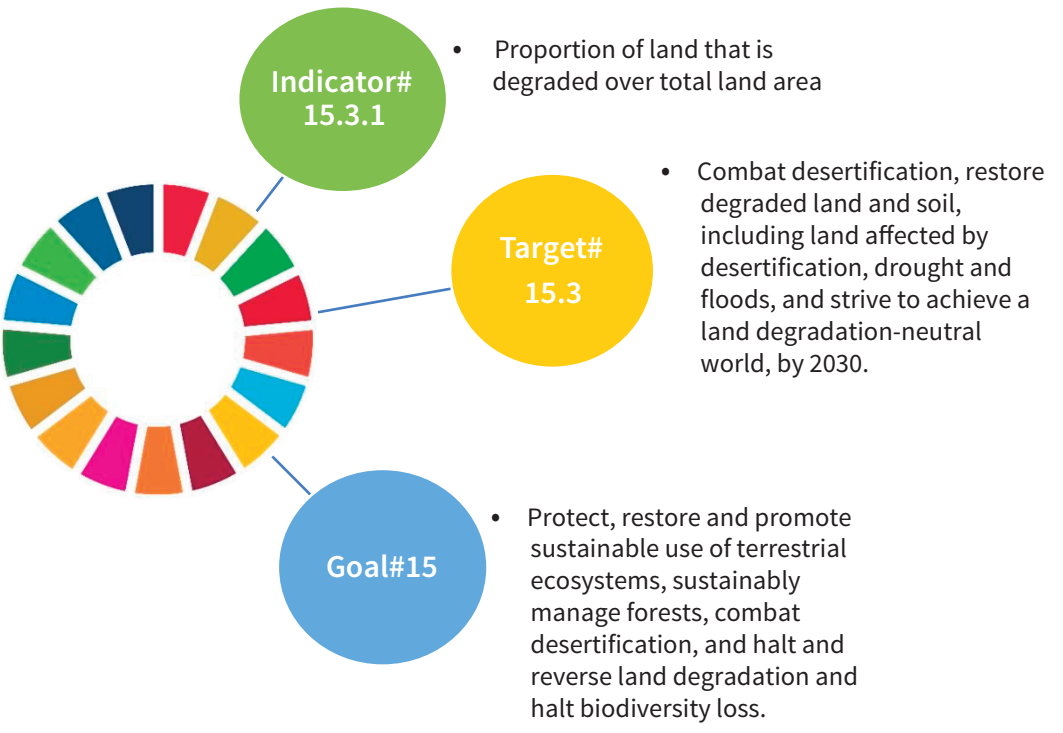

Figure 27: Land Degradation Goal, Target and Indicator in SDGs

Topic 4.6
National Response

The Government of Bangladesh (GoB) signed the UNCCD in 1994 and ratified the Convention on 26 January 1996. The Secretary of the Ministry of Environment and Forests (MoEF) is the National NFP for UNCCD. To mainstream the Convention into the national development planning and implementation of many policies, legislation, institutions are relevant. As such, Bangladesh has integrated the issue into relevant policies, legislation, strategies and accordingly developed programmes.

In the early 1970s and 1980s in the drought-prone areas of northern Bangladesh, the agricultural development projects were developed to provide ground water irrigation through thousands of Shallow and Deep Tube Wells. Since scarcity of water was the main obstacle against intensive agriculture, pumping up groundwater helped grow crops year-round. Through thousands of shallow and deep tube wells, HYV paddy was introduced to hundreds of acres of marginal and sloped lands.

Since land is being over used and degraded due to pressure of population, effective population control, judicious land use and sustainable agricultural practices are urgently required to mitigate droughts. The carrying capacity of the land resource in Bangladesh has been critically surpassed. Use of land for production of two or three crops a year may be limited. Because of this, soil is not getting sufficient rest to recover its health. The marginal lands should not be used for agricultural purposes. Public awareness is needed to handle land degradation and to protect land from misuse and over use. Agrochemicals should be carefully used. The problem of land degradation may be studied to develop sustainable land use. A national land use policy is urgently needed to utilize land in judicious manner.

Rehabilitation programs should have effective mechanism to minimize the impact of drought.

Steps are required to develop national programs for drought preparedness (similar to flood and cyclone preparedness). Early warning schemes have to be undertaken to inform the population of drought-prone areas and introduce drought-relief measures for the affected people as part of the national planning strategy/ national program for drought preparedness (similar to flood and cyclone preparedness). Attempts are being taken to update the drought data jointly with BARC and DAE in the drought affected the aman rice areas. Efforts for mitigation for such droughts are quite inadequate due to lack of fiscal resources. Bangladesh has responded to reversing these trends of land degradation through incorporating these activities as integral components of the national development strategies and national

Climate Smart Agriculture

Based on the projections on population growth and food consumption patterns, FAO suggested that agricultural production of countries like Bangladesh will need to increase by at least seventy percent by 2050. Since climate change is one of the stressors of food security, climate-smart agriculture is of crucial importance. In this practice, careful selection of production systems, adoption of appropriate methods and practices and use of suitable varieties and breeds are conducted. FAO provides numerous resources, guidelines, tools, technologies, and other applications to help policy makers, extension workers and farmers in selecting the most appropriate production system.

Numbers of methods and practices are being adopted to address challenges with rice cultivation. Production systems have been adopted by altering cropping patterns, planting dates and farm management techniques. The use of Ammonium Sulphate supplements has also been used to promote soil microbial activity and reduce methanogens. In addition, Urea Deep Placement (UDP) technology has been developed where urea in the form of super granules or small briquettes is placed under the soil near the plant roots and out of the

floodwater. In Bangladesh, this practice has shown 50-60 percent savings in urea use and yield increases of about 1 ton per ha. Climate-smart agriculture is highly important for addressing climate change induced land degradation.

4.6.1 Policy, Legislation, Institution and Programmes

Following policies includes land degradation and desertification issues

1. National Environment Policy 2018
2. National Agriculture Policy 2013
3. National Salt Policy, 2011
4. National Sustainable Development Strategy 2010-2021
5. National Plan for Disaster Management 2010-2015
6. National Coastal Zone Policy 2005
7. National Land Use Policy 2001
8. National Forest Policy 1994 (updated Forest Policy 2019 submitted for approval)
9. National Tourism Policy 1992

Legislation

Following legal instruments are important for addressing UNCCD obligations:

1. Ecologically Critical Area (ECA) Management Rules 2017
2. Bangladesh Water Act, 2013
3. Brick Manufacturing and Brick Kilns Establishment (Control) Act, 2013
4. The Bangladesh Biological Diversity Act 2017
5. Ship Breaking and Ship Recycling Rules, 2011
6. The Environment Court Act 2000
7. Conservation of Playing field, Open space, Garden and Natural Water Body Act, 2000
8. The Bangladesh Environment Conservation Rules (ECR), 1997
9. The Bangladesh Environment Conservation Act (ECA), 1995
10. The Land Reforms Act, 1984
11. The East Bengal State Acquisition and Tenancy Act, 1950
12. The Forest Act, 1927

Institutions Related to Sustainable Land Management

Five ministries of the Bangladesh Government shoulder the concerns relating to the land degradation: Ministry of Agriculture (MoA), Ministry of Environment, Forest and Climate Change (MoFCC), Ministry of Local Government Rural Development and Cooperatives, Ministry of Planning, and Ministry of Food.

Department of Environment (DoE) under MOEFCC is the focal point and reports the position of Bangladesh to UNCCD.

Bangladesh Agricultural Research Council (BARC) under MoA coordinates work of the Bangladesh Agricultural Institute, four crop-based institutes (for rice, jute, sugar cane and tee) and an institute for nuclear research.

Soil Resource Development Institute (SRDI) under MoA is a separate institute is responsible for the inventory and evaluation of soil resources. With international cooperation, the Institute has acquired a considerable amount of detailed information and is the main repository of knowledge on land resources.

Barind Multipurpose Development Authority (BMDA) under MoA is engaged in sustainable land management in the northern part of Bangladesh.

Bangladesh Water Development Board (BWDB) under MoWR manages flood protection, drainage and irrigation projects, works with land and water use. The Land Reclamation Directorate functions under this Board.

Bangladesh Institute of Development Studies (BIDS) under MoP conducts research in economics, demography and social sciences, including in relation to agriculture and land.

Chittagong Hill Tracts Development Board (CHTDB) under MoCHTA is concerned with most aspects of development specific to the hill areas.

Other relevant research institutes include the Bangladesh Forest Research Institute, the Bangladesh Livestock Research Institute, and Agriculture Universities.

National Land Degradation Neutrality Targets 2018

ln order to halt, reverse or restore land degradation to assure ecosystem services and food security of the nation, the Ministry of Environment, Forest and Climate Change (MoEFCC), the National Focal Point (NFP) of the United Nations Convention to Combat Desertification (UNCCD) in Bangladesh, developed the Land Degradation Neutrality (LDN) targets. Based on the national commitment to achieve LDN by 2030, the following preliminary LDN targets have been defined for Bangladesh:

Target 1: To improve soil fertility and Carbon stock in 2000 km^2 of cropland area by 2030.

Target 2: To reduce land use/ cover conversion in 600 km^2 of forest area by 2030.

Target 3: To reduce waterlogging in 600 km^2 area by 2030.

Target 4: To reduce soil erosion in hilly areas in 600 km^2 area by 2030.

Target 5: To protect non-saline land areas from salinity intrusion in 1200 km^2 in coastal zone area by 2030.

Target 6: To reduce river bank erosion @100ha/year covering 100 km^2 areas by 2030.

National Action Programme (NAP) on UNCCD 2015 -2024

The Bangladesh NAP 2015-2024 has been formulated to enhance the implementation of the UNCCD Strategy 2008-2018 at the country level. Its vision is “to forge a global partnership to reverse and prevent desertification/ land degradation and to mitigate the effects of drought in affected areas in order to support poverty reduction and environmental sustainability”. The realization of this vision could be achieved by the five Operational Objectives of the UNCCD 10-year Strategy:

a. Advocacy, Awareness Raising, and Education
b. Policy Framework
c. Science, Technology and Knowledge
d. Capacity Building; and Financing and
e. Technology Transfer

Specific objectives of the Bangladesh NAP are:

i. To identify the emerging issues related to DLDD with their underlying causes.
ii. To analyze relevant national policies and uses them in the revision and alignment of NAP.
iii. To gather and compile information on the current state to update the baseline of the country.
iv. To identify all relevant stakeholders with their roles and responsibilities for sustainable management of land resources of the country.
v. To develop new projects and programmes under all thematic areas of NAP to address land degradation and desertification.

Bangladesh NAP identified 21 programmes which cover all the specific objectives and address all the issues relating to desertification, land degradation, and drought. Gender mainstreaming is one of the valued cross-cutting development agenda of the NAP in line with both the Convention and 10-year Strategic Framework of UNCCD (Table 26).

Table 26: List of Programmes under NAP 2015-2024 (DoE 2015)

Sl	Name of the Programmes	Expected Outcome
1	Awareness raising and education of relevant local, national and international stakeholders on DLDD issues in Bangladesh.	Increased awareness about land degradation issues in the country together with the synergies of reducing climate change vulnerability and biodiversity conservation among community members communicating the land degradation among local, national and international stakeholders.
2	Harmonization of land related development policies, legislations, regulations and institution	Policy harmonization of CCD related legal instruments of the country
3	Integration of SLM into Poverty Alleviation Strategies.	SLM integrated into poverty alleviation programs
4	Promotion of integrated management of Hilly and sloppy land.	Integrated management of hill land of the country
5	Rehabilitation of degraded agricultural lands to promote sustainable utilizations of land resources	To reclaim and rehabilitate degraded lands and promote sustainable utilization of land resources.
6	Management of low-lying lands for productivity improvement and maintaining ecological functions	Rational use of the low-lying lands of the country
7	Promote sustainable agriculture	Enhanced agricultural productivity without harming the ecosystem
8	Integration of Livestock /fisheries into Sustainable Land Management activities	Increased fish and livestock production through SLM practices.
9	Integrated biodiversity conservation in ecologically disadvantage areas	Synergy between combating land degradation and biodiversity conservation.
10	Prevention of forest covers decline and Restoration of degraded forests	Prevention of forest encroachment.

Sl	Name of the Programmes	Expected Outcome
11	Watershed Management and Conservation in the hilly landscape	Control of damaging runoff and degradation and conservation of soil and water and managing, reducing downstream siltation and utilizing the runoff water for useful purpose.
12	Promote sustainable groundwater management	Rational uses of the groundwater of the country
13	Establishment a drought monitoring cell and early warning system	Forecast warning authority established under the Ministry of Environment and Forests
14	Up-scaling of adaptation mechanism to drought	To educate communities living in the drought prone areas to reduce the adverse effect of droughts by strengthening adaptation mechanisms.
15	Disaster risk reduction in vulnerable areas	To avoid land degradation in fragile ecosystems of the country by integrating this aspect into physical planning of the infrastructure.
16	Prevention of land degradation by development activities and industry	To minimize land degradation caused by improper siting and construction of infrastructure, and also, to minimize the effects of material acquisition on land and water resources.
17	Prevention of River erosion and rehabilitation affected people	To minimize loss of land, assets and damage to ecosystems by river erosion and to rehabilitate degraded river banks and affected people of the country.
18	Investigating interrelationship among ecosystem degradation, biophysical factors and socioeconomic conditions.	To conduct research for generating scientific knowledge regarding major drivers responsible for the degradation.
19	Enhancing institutional capacity to address sustainable land management	To stimulate awareness among communities including GO and NGOs on issues of combating desertification and mitigating the effects of drought, also to equip them with relevant knowledge on issues for combating desertification and mitigating the effects of drought, and to increase the local capacity to facilitate the coordination of activities on combating desertification.
20	Development of Land Resource Information System	To make the land resources data base and crop suitability assessments available to agricultural and forestry research, extension and development planners at national, regional and district levels.
21	Development of a Knowledge Management System	To develop a Knowledge Management System (KMS) to support SLM in the country using modern information technologies.

National Action Program (NAP) for Combating Desertification, 2005

The key objective of the NAP was to fight desertification under eight themes, mentioned below:

Theme 1	Understanding the desertification scenario
Theme 2	Promotion of awareness and capacity building
Theme 3	Institutional Arrangements
Theme 4	Reclamation and rehabilitation of degraded land to promote sustainable utilizations resources
Theme 5	Land degradation/desertification mitigation and Poverty Alleviation Strategies
Theme 6	Promotion of active participation of communities in land management programmes
Theme 7	Judicious location of construction sites and physical infrastructure
Theme 8	Research and technology development

The Bangladesh Government has taken steps to transform the idea of the convention into action as well as has the initiative to integrate CCD into training modules in various sector of the administration.

Bangladesh Capacity Development Action Plan for Sustainable Environmental Governance, 2007

To assess the capacity needs and prepare a capacity development action plan for sustainable environmental governance, Bangladesh undertook the National Capacity Self-Assessment (NCSA) initiative in 2007 (MoEF 2007). The NCSA identified the following drivers of land degradation in Bangladesh: population pressure, land use change, soil salinity, river bank erosion, topsoil loss and landslide, pollution from Brickfields, waterlogged soil and drainage congestion, intensive cultivation, agrochemicals, soil compaction, drought, acidification and decline of organic matter, unplanned and over-exploitation of underground water for irrigation causing depletion of groundwater table; irresponsible mining of sand, gravel, coal etc. from forest and agricultural lands; conversion of agricultural lands and natural forests into other unsustainable economic uses; discharge of untreated industrial effluents; inadequate scientific and institutional capacities in land management; temperature variation and its effect on production of grains. The NCSA identified five priority actions to address land degradation:

1. Integration of SLM into national development plans and policies.
2. Effective implementation of land use policy through integrating the existing relevant agencies.
3. Effective policy intervention to minimize topsoil loss, the landslide in hilly areas, soil compaction and the decline in soil moisture and micro-nutrient levels.
4. Effective flood control policies to minimize the impact of riverbank erosion.
5. Effective policy measures to manage waterlogging and drainage congestion.

As synergy actions for all three conventions (UNCBD, UNCCD, and UNFCCC) the NCSA identified six priority area: i) Trained and skilled manpower for sustainable environmental governance in place, ii) Integrated ecosystems management facilitated, iii) Effective Participation in the Conference of the Parties (CoP) and Subsidiary Bodies Meeting, iv) Promotion of education, training, and public awareness, v) Inter-linkages among national policies and their implementation, and vi) Financial resource mobilization facilitated.

4.6.2 Mainstreaming Land Degradation issues into National Planning

The land is the ultimate basic resource for all development activities. We all depend on land for our daily activities- from food production to funeral. The land is essential for each step of change, growth and improvement activities, including but not limited to agricultural production, plantation for timber or carbon sequestration, transportation, housing construction, climate change adaptation or biodiversity conservation. It has been broadly addressed in the strategic Framework 2018-2030 of UNCCD. It has also been addressed globally in Sustainable Development Goals (SDGs). To mainstream land degradation issues in the national development planning, Bangladesh has addressed the issue in the National Sustainable Development Strategy, perspective plan and in the Seventh Five Year Plan.

Bangladesh Delta Plan 2100

Bangladesh Delta Plan (BDP) 2100 has provided emphasis on the sustainable land. The BDP suggested spatial planning for optimize use of land resources. The plan portrayed the inter dependency of flood risk interventions and spatial development. To reduce the land scarcity delta plan suggested Multifunctional land use, land reclamation and high-density city. The plan identified constraints and challenges of land reuse management in the River System and Estuaries, Haor and flash flood areas, Coastal zone, Barind and drought prone area.

The plan recommended reclamation and development of land in the river systems and estuaries and coastal zone and optimizing use of coastal land. Planning, managing and developing strategies for land resources are integral part of BDP 2100. Following are the Land Management strategies according to BDP 2100 Goal:

1. Goal 1: Ensure Safety from Floods and Climate Change related Disasters
    a. Strategy 1.1: Preserve/conserve agricultural land from floods or erosion to sustain food grain production
    b. Strategy 1.2: Prevention of salinity intrusion and desertification
2. Goal 3: Ensure Sustainable and Integrated River Systems and Estuaries Management
    a. Strategy 3.1: Management of newly accreted land in the Meghna Estuary
3. Goal 4: Conserve and Preserve Wetlands and Ecosystems and Promote their Wise Use
    a. Strategy 4.1: Sustainable coastal land management for enhancing agriculture and nonagricultural land
4. Goal 5: Develop Effective Institutions and Equitable Governance for In-Country and Trans-Boundary Water Resources Management
    a. Strategy 5.1: Development of Land Information System (LIS) for Land Administration and Management
    b. Strategy 5.2: Development of Digital Land Resource Management System
    c. Strategy 5.3: Improvement/formulation of new National Land Use Policy
    d. Strategy 5.4: Reviewing and updating/enactment of Laws/Regulations relating to Alluvion and Diluvian to improve efficiency of land administration of accreting and reclaimed land
    e. Strategy 5.5: Formulation of necessary laws and acts to form Land Zoning
    f. Strategy 5.6: Increase climate change adaptation capacity for land management
    g. Strategy 5.7: Ensure gender equitability for land ownership

5. Goal 6: Achieve Optimal and Integrated Use of Land and Water Resources
    a. Strategy 6.1: Sustainable land utilization for achieving food security
    b. Strategy 6.2: Spatial land use planning for urbanization
    c. Strategy 6.3: Optimization of Land Use
    d. Strategy 6.4: Formulation of Spatial Planning and Land Resource Management Act
    e. Strategy 6.5: Management and protection of Marine land
    f. Strategy 6.6: Enhance afforestation and plantation in the coastal zone for stabilizing the land
    g. Strategy 6.7: Restoration and protection of soil health
    h. Strategy 6.8: Reducing soil erosion and land loss
    i. Strategy 6.9: Integrated management of coastal water infrastructures to protect land

National Sustainable Development Strategy

National Sustainable Development Strategy (NSDS) 2010-2021 has been developed to guide Bangladesh to face the challenges of sustainable development and for ensuring social justice (GED 2013). NSDS has been mandated for all countries by the Agenda 21 of the Rio Declaration at the UNCED, 1992. Having an Agreement with United Nations Environment Program (UNEP) in 2007, the Government designated the Ministry of Environment and Forests (MoEF) as the National Focal Point (NFP) for the formulation of the NSDS.

The strategy document emphasizes on five strategic areas to sustainable development which will assure a better quality of life for all and help all to live with the natural resources without devaluing it, where bottom-up approach for considering the stakeholder's need for accurate implications is accepted. The development vision here is long term, comprehensive, reliable and committed to high-level governance. Following are the strategic priorities of NSDS:

- Sustained economic growth
- Development of priority sectors (including agriculture and energy)
- Urban environment
- Social security and protection
- Environment, natural resource, and disaster management

The NSDS has addressed Land and Soil under the environment and natural resources chapter. The national sustainable development strategy of Bangladesh recognizes the present status of the land and soil and identified key challenges and suggested strategies to tackle land degradation. Following are the specific strategies: Land Zoning, reducing soil and land loss, land reclamation in the coast, restoring soil fertility and checking salinity intrusion.

Land Degradation in the Perspective Plan of Bangladesh

The Perspective Plan of Bangladesh (2010-2021) is popularly known as 'Vision-21' that emphasize on poverty eradication with an emphasis on minimizing environmental damage (GED 2012). Various Government policies and strategies are giving importance on biodiversity, wetlands, and other lands which includes a target to achieve tree coverage of 2.84 million hectors by the year 2021. Section#13.4 of the plan highlights on Environment, Climate Change, and Disaster Management and addresses two issues on land degradation:

- "Best Utilization of the available land, arresting and reversing the land degradation process, is a major policy thrust. In this context, an integrated plan of action may be prepared. Also, especially for urban areas, further unplanned growth needs to be stopped and an urban renewal strategy will be formulated and implemented."
- "The policy of crop diversification will be strengthened and properly implemented, as it is economically sound and should help reverse the land degradation process."

Land Degradation in the 7th Five Year Plan of Bangladesh

Five-year plans are nucleus planning documents of Bangladesh. The country is implementing its 7th Five Year Plan (7FYP 2015) for the period of 2016-2020. The 7th Five Year Plan focuses on land and land resources in the following areas:

i. In the area of Urban Development, the 7FYP targets for 'inclusive urban planning based on sustainable land use planning and zoning'.
ii. In order to have Environmental Sustainability, the plan has a vision of having land zoning for sustainable land/water use completed by the end of the 7FYP.
iii. The 7FYP targets to have 15% of land covered by forestry with 70% tree density, by the year 2020.
iv. 15% of wetlands in peak dry season is protected as aquatic sanctuary
v. Promoting Eco-tourism at least in 20 protected areas in ECAs vi. The 7FYP focuses on setting up more special economic zones to overcome the land constraint.
vi. The 7FYP has mentioned that the land quality is also deteriorating due to degradation of soil fertility (e.g. nutrient imbalance), soil erosion, soil and water pollution and increased soil salinity.
vii. The 7FYP targets to have institutional set up for proper land use planning system.
viii. Almost all suitable land is expected to come under HYV within the next decade or so.
ix. Promote adoption of modern agricultural practices in the dry land, wetland, hills and coastal areas including use of environment-friendly green technology.
x. Concentrating on rural households to release more arable land for crop production;
xi. Take measures to reclaim land in the coastal areas.
xii. Optimization of available land resources.

Key Challenges Identified by the 7th FYP

i. The 7FYP has identified the following challenges in the land sector:
ii. Degradation of land (salinity, erosion, water logging etc.).
iii. Reduction of the loss of arable land as a major challenge during its implementation period.
iv. Expanding agriculture to the newly accreted coastal land and marine islands.
v. Competing demand for land beyond agriculture (industry, urbanization, infrastructure needs, etc. uses).
vi. Protecting land loss from erosion.

4.6.3 Implementation of UNCCD

First National Report on Implementation of UNCCD, 2001

The First National Report on Implementation of the United Nations Convention to Combat Desertification was prepared in 2001. With a brief presentation of physical aspects of desertification, the report focused on various aspects of the convention, as stated below:

Formation of a National Coordination Body (NCB) was proposed in the report. The proposed NCB included (i) Ministry of Environment and Forest with associated Department and Directorate; (ii) Ministry of Agriculture with associated Department and Directorate; (iii) Ministry of Water Resources with associated Department and Directorate; (iv) Ministry of Land with associated Department and Directorate; (v) Ministry of Fisheries and Livestock with associated Department and Directorate; (vi) Ministry of Defense (SPARRSO and BMD); (vii) NGOs; and (viii) Research Organizations. The Department of Environment (DoE) was assigned the mandates of the UNCCD.

Priority areas identified by the report included: (i) Strengthening the knowledge and information base; (ii) Expansion of intensive soil and water conservation and afforestation activities; (iii) Development and promotion of agroforestry system and sustainable alternative livelihood; (iv) Development of comprehensive anti-desertification program integrated with national environment and development plans; (v) Development of drought preparedness and drought relief and self-help schemes; and (vi) Launching public awareness and promotion of popular participation programs.

Second National Report on Implementation of UNCCD, 2002

The Second National Report on Implementation of UNCCD was developed in 2002. Ministry of Environment and Forests prepared the report on behalf of the country and submitted to the UNCCD. The report expressed six priority activities of Bangladesh to address UNCCD, as stated below:

- Formation of National Coordinating Body (NCB) for implementation of UNCCD.
- Formulate NAP for implementation of UNCCD. This would involve collating all existing knowledge related to land degradation and desertification and facilitating a participatory approach to informing and soliciting inputs from all stakeholders who can affect positive changes in land degradation activities in Bangladesh;
- Conduct a NAP workshop to prioritize the issues that are most pressing in the efforts to reversing land degradation and desertification processes;
- Formulate feasible implementation programs which can be monitored and are specific in their time schedules to meet certain objectives of the NAP;
- Plan actions and mechanisms to meet the UNCCD obligations and enrich the knowledge base of land degradation and desertification processes;
- Ensure effective participation and linkages in the regional and sub-regional programs under UNCCD and Thematic Program Network (TPN) for cooperation between affected countries.

Third National Report on the Implementation of the UNCCD, 2006

The Third National Report on the Implementation of the UNCCD was published in 2006. The report identified some action and measures for the implementation of the UNCCD. The actions are as below:

1. The implementation of NAP after its formal approval;
2. Capacity building and resource mobilization for sustainable land use management; and

3. List of action under MDGs and PRSP those are strongly related to UNCCD, including but not limited to
    a. Eradication to extreme poverty and hunger,
    b. Promoting gender equality and empowering women,
    c. Ensuring environmental security,
    d. Ensuring global and regional partnership for development,
    e. Promoting good governance,
    f. Investment in human development, and
    g. Ensuring social security.

UNCCD Fourth National Report, Bangladesh 2011

Fourth National Report was published in May 2011. The report included the performance indicators, financials, projects and programmes relating to the implementation of UNCCD in Bangladesh under the following sections:

A. Performance indicators

- Operational objective 1: Advocacy, awareness raising and education (media campaign)
- Operational objective 2: The Policy framework
- Operational objective 3: Science, technology, and knowledge
- Operational objective 4: Capacity building
- Operational objective 5: Financing and technology transfer

B. Standard Financial Annex

C. Programme and Project Sheet (PPS)

D. Best Practices

UNCCD Fifth National Report, Bangladesh

The 5th national report to UNCCD has not been prepared.

UNCCD Sixth National Report Bangladesh 2014

The sixth national report was published in June 2014. The report included the performance indicators, financials, projects and programmes relating to the implementation of UNCCD in Bangladesh.

UNCCD Seventh National Report Bangladesh 2018[2]

(Performance Review and Assessment of Implementation System Seventh reporting process 2018: Report from Bangladesh)

This is the latest national report of Bangladesh to UNCCD submitted on 19 August 2018. The report is divided into three broad sections: I. Country profile, II. Strategic objectives (SO) and III. Implementation framework. The sections are reported by the performance indicators and targets represented in both qualitative and quantitative data and assessments. The indicators and targets of the report are as below:

2 https://prais.unccd.int/sites/default/files/pdf_reports/unccd_Bangladesh_2018.pdf accessed on 17 January 2019

I. Country profile	• Land area (Indicates the total land area, the area covered by water bodies and total country area) • Demographics (Estimates of the urban, rural and total population living in your country)
II. Strategic Objectives (SO)	1. Strategic objective 1: To improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality • Indicator SO1-1: Trends in land cover • Indicator SO1-2: Trends in land productivity or functioning of the land • Indicator SO1-3: Trends in carbon stocks above and below ground • Sustainable Development Goal indicator 15.3.1: Proportion of land that is degraded over total land area 2. Strategic objective 2: To improve the living conditions of affected populations • Indicator SO2-1: Trends in population living below the relative poverty line and/or income inequality in affected areas • Indicator SO2-2: Trends in access to safe drinking water in affected areas 3. Strategic objective 3: To mitigate, adapt to, and manage the effects of drought in order to enhance resilience of vulnerable populations and ecosystems 4. Strategic objective 4: To generate global benefits through effective implementation of the United Nations Convention to Combat Desertification • Indicator SO4-1: Trends in carbon stocks above and below ground • Indicator SO4-2: Trends 5. Additional indicators (nationally relevant indicators) for strategic objectives 1, 2 and 4 6. Strategic objective 5: To mobilize substantial and additional financial and non-financial resources to support the implementation of the Convention by building effective partnerships at global and national level • Indicator SO5-1: Trends in international bilateral and multilateral official development assistance • Indicator SO5-2: Trends in domestic public resources • Indicator SO5-3: Trends in number of co-financing partners • Indicator SO5-4: Resources mobilized from innovative sources of finance, including from the private sector

III. Implementation framework	Financial and non-financial resources • Increasing mobilization of resources • Using LDN as a framework to increase investment Policy and planning • Action Programmes • Establishing policies • Synergies • Mainstreaming DLDD • National policies Action on the Ground • SLM Practices • Restoration and rehabilitation • Drought risk management and Early warning systems • Alternative livelihoods • Establishing Knowledge sharing systems

Topic 4.7
Combating Land Degradation: Good Practices in Bangladesh

The material of this session is provided as a separate document titled
“Good Practices and Innovations in Implementing Rio Conventions In Bangladesh”.

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Notes on Module-4 of the Training Manual

ANNEXURE

ANNEX I: Contributors and Key Informants

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পরিবেশ ও বন মন্ত্রণালয়
পরিকল্পনা শাখা-২

নং-২২.০০.০০০০.০৭৯.১৪.০৩৩.১৫- ৬৪ তারিখ: ০৮/০২/২০১৮

বিষয়ঃ পরিবেশ অধিদপ্তর কর্তৃক বাস্তবায়নাধীন "National Capacity Development for Implementing Rio Conventions through Environmental Governance" শীর্ষক প্রকল্পের আওতায় প্রণীত প্রশিক্ষণ ম্যানুয়াল পর্যালোচনার জন্য টেকনিক্যাল কমিটি গঠন প্রসংগে।

নির্দেশক্রমে জানানো যাচ্ছে যে, পরিবেশ অধিদপ্তর কর্তৃক বাস্তবায়নাধীন "National Capacity Development for Implementing Rio Conventions through Environmental Governance" শীর্ষক প্রকল্পের আওতায় প্রণীত প্রশিক্ষণ ম্যানুয়ালটি পর্যালোচনার জন্য যথাযথ কর্তৃপক্ষের অনুমোদনক্রমে নিম্নোক্তভাবে টেকনিক্যাল কমিটি গঠন করা হ'লঃ

১।	ড. নূরুল কাদির, অতিরিক্ত সচিব (জলবায়ু পরিবর্তন),পরিবেশ ও বন মন্ত্রণালয়।	সভাপতি
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৩।	জনাব মোঃ মাহবুব হোসেন, অতিরিক্ত সচিব, স্থানীয় সরকার বিভাগ	সদস্য
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৫।	জনাব ফজলে রাব্বী সাদেক আহমেদ, পরিচালক, পিকেএসএফ।	সদস্য
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৭।	জনাব মোঃ জিয়াউল হক, পরিচালক ও প্রকল্প পরিচালক, পরিবেশ অধিদপ্তর।	সদস্য সচিব

কমিটির কর্মপরিধিঃ

"National Capacity Development for Implementing Rio Conventions through Environmental Governance" শীর্ষক প্রকল্পের আওতায় প্রণীত প্রশিক্ষণ ম্যানুয়ালটির কারিগরি ও ব্যবহারিক উপযোগীতা পর্যালোচনা করে প্রয়োজনীয় সুপারিশ প্রদান।

৮/২/১৮
(দীপান্বিতা সাহা)
সিনিয়র সহকারী প্রধান
ফোন ঃ ৯৫৪০২৬০

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৭। উপসচিব (উন্নয়ন), পরিবেশ ও বন মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
৮। জনাব মোঃ জিয়াউল হক, পরিচালক ও প্রকল্প পরিচালক, "রিও কনভেনশন বাস্তবায়নের লক্ষ্যে সক্ষমতা বৃদ্ধি" শীর্ষক প্রকল্প ,পরিবেশ অধিদপ্তর, পরিবেশ ভবন, আগারগাঁও, ঢাকা।

সদয় অবগতির জন্য অনুলিপিঃ

০১। সচিব মহোদয়ের একান্ত সচিব, পরিবেশ ও মন্ত্রণালয়, ঢাকা।
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