CHAPTER 15

ENVIRONMENT AND DEVELOPMENT

People now-a-days are much more conscious about environmental issues than in the past. Protection, preservation and development of the environment are receiving increasing attention during the formulation of government's development strategy. Relationship between human life and environment is quite strong and intimate. As human beings we exploit the environment in our endeavor for better living. Such exploitations, over the centuries, have resulted in serious threat to the environment itself. Industrialization, exponential population growth, increased dependence on use of automobiles, indiscriminate felling of trees and such other activities have been the root causes to the present-day vulnerability of the global environment resulting in global warming with consequent gradual disappearance of polar ice-caps and rise in sea-levels.

Over exploitation of environment would heavily impact life and living of the people of the coastal regions of the world including Bangladesh. As such environmental problem is also considered as developmental issue. There is no scope to look at economic and environmental issues in isolation. Various government, non-government and civil society organisations including environment journalists are now working in cohesion for environmental protection and development.

Economic Growth and Environment

Conventionally economic growth implies growth of goods and services produced in an economy. Economic growth has been considered as the precondition of human welfare and development. But the traditional system of estimating economic growth on the basis of goods and services do not consider environmental effect. Recently the emergence of the concept of sustainable development made it clear that alternative method is needed for estimating physical and economic development appropriately to measure standard of living of human being. In this method, the depletion of natural resources and environmental issues that has impact on sustainable development are taken into account.

Global Environmental Movement

The Stockholm Conference is considered as a milestone in the emergence of global environmental movement. This Conference, held in 1972, opened up the opportunity to look at the environmental issues from a wider social, political and economic perspective. As many as 113

countries, 19 international agencies and 400 non-governmental organisations (NGOs) attended the Stockholm Conference (UN Conference on the Human Environment).

As an instant outcome of the Stockholm Conference, the United Nations Environmental Programmes (UNEP) was established in Nairobi, Kenya in 1972 and also the International Union for the Conservation of Nature (IUCN) in 1977. The Stockholm Conference had several important outcomes. It prompted creation of environmental agencies/ministries and also the development of national environmental policies/action plans in many countries.

The International Panel on Climate Change (IPCC), coming into existence in 1988, has since been relentlessly while undertaking research on the various issues related to changes in the global climatic conditions and arousing public opinion and awareness towards undertaking required steps in confronting the potential challenges. The recent IPCC research publication aiming at building awareness of the world community of its actions in respect of the rate, at which changes are taking place in the global environment, has been the focus of attention of all concerned. The World Community, at present, has been taking united actions towards implementation of the recommendations of the IPCC's research report.

Several international conventions, viz., the Basel Convention, the Rotterdam Convention and the Stockholm Convention devoted to mitigation and control of the adverse impacts due to hazardous and harmful chemicals and substances have been globally ratified. Various activities are being undertaken towards implementation of the recommendations of these Conventions.

Kyoto Protocol

The Kyoto Protocol signed to reduce carbon dioxide and greenhouse gas emission that is responsible for increasing global warming, mutation of avalanche and rising sea level came into force from 16 February 2005. As of June 2008, 182 parties have ratified the Kyoto Protocol. Till now, 137 developing countries have ratified the Kyoto protocol, including Brazil, China and India, but have no obligation beyond monitoring and reporting emissions. On December 11, 1997, the negotiations on the Kyoto Protocol under the United Nations Convention on Climate Change Framework were completed. The Kyoto Protocol put 36 industrialised nations under obligation to meet specific legally binding targets for emissions of six-greenhouse gas i.e. carbon dioxide, methane, nitrous oxide, by droflurocarbons, per fluorocarbons and sulphur hexafluoride emission by 5.2 percent below 1990 levels, between 2008-2012.

Below is a list of the change in greenhouse gas emissions for countries which are parties to the Climate Change Convention as reported by the United Nations:

Table: 15.1 Change in Greenhouse Gas Emissions of some elected Countries

Country	Change in greenhouse gas emissions (%) (1990-2004)	EU assigned objective for 2012 (%)	Treaty obligation 2008-2012 (%)
Germany	-17%	-21%	-8%
Canada	+27%	N/A	-6%
Australia	+25%	N/A	+8%*
Spain	+49%	+15%	-8%
United States	+16%	N/A	-7%*
Norway	+10%	N/A	+1%
New Zealand	+21%	N/A	0%
France	-0.8%	0%	-8%
Greece	+27%	+25%	-8%
Ireland	+23%	+13%	-8%
Japan	+6.5%	N/A	-6%
United Kingdom	-14%	-12.5%	-8%
Portugal	+41%	+27%	-8%
EU-15	-0.8%	N/A	-8%
China*	+47%		
India*	+55%		

Source: Internet

[* China and India are large contributors, but are not required to meet numerical limitations of greenhouse gas.]

Since Kazakhstan and the US did not ratify the treaty, emissions targets are not a treaty obligation. Among various experts, scientists, and critics, there is a debate about the usefulness of the protocol, and there have been cost-benefit studies performed on its usefulness.

UNEP used the theme World Environment Day 5 June 2008: Kick the Habit! Towards a low carbon economy; Bangladesh also recognized, and following the UNEP theme. Bangladesh is low carbon dioxide emitting country for instance, the per capita carbon dioxides emission is estimated at 0.2 ton/year, while the average for developing countries is 1.6 ton/year and in USA the per capita emission is 20 ton/year. The Kyoto Protocol plays an important role for forestation activities that absorb carbon, such as planting trees facilitate low level of emission of greenhouse gas.

Box 15.1: Global Warming Developing Countries are in danger!

The developing countries would be affected seriously due to global warming. The apprehensions of the rising of sea level, hunger in Asia and Africa and extinction of many plants and animal species might pose as a reality much earlier than what the scientists predicted. In the first half of April 2007, the Intergovernmental Panel on Climate Change (IPCC) of the UN met in Brussels, where the scientists predicted that the global warming will make Bangladesh, Maldives, and other coastal regions more vulnerable than others. Delegates from 100 countries been approved a draft policy presented by scientists.

The report of IPCC made an assessment that 20 to 30 percent of plant and animal species are in danger of extinction if temperature exceeds 1.5 to 2.5 degrees centigrade (2.7 to 4.5 degrees Fahrenheit).

Besides, due to climate change Asia will probably witness more than 1000 million people being affected seriously by the year 2050. Bangladesh Myanmar, China, Thailand, Indonesia, Malaysia, Philippine and Vietnam are under threat of the rise of sea level and would be affected by storm surges and cyclones. Reports also indicate that the rise of sea level would submerge several small island countries in the Asia and the Pacific region.

Drought will increase in Sub-Saharan Africa, Africa as a whole will probably witness 75 to 250 million people being affected by water stress by the year 2020.

The IPCC's current forecast is that by 2100, the earth's temperature will go up by 1 degree to 6.4 degree centigrade.

Clean Development Mechanism (CDM) Activities

Another important feature of the Kyoto Protocol is the Clean Development Mechanism (CDM), through which the Developed Countries (DCs) accumulate credit in their own account. In this mechanism the DCs instead of reducing greenhouse gas emission in their industries, invest in developing (Annex-B-39 countries) countries and help in reducing greenhouse gas emissions. Through CDM mechanism both developed and developing countries would be benefited. With a view to developing management of waste of the city of Dhaka under the auspices of CDM, 700 MT of decomposable waste will be collected from kitchen markets of various locations to prepare compost fertilizers. Such a programme will facilitate the Dhaka City Corporation in saving its cost in respect of waste collection and transportation and, simultaneously, ensure availability of environment-friendly organic fertilizers produced from the above collected kitchen market wastes. The project has been approved by the CDM Executive Board of UNFCCC. Production of waste-based compost fertilizers would result in and ensure cessation of 900,000 MT GHG emissions which could be transacted as CER under CDM. At present, the infrastructure development is going on toward implementation of the project. Based on the available data, so far 1128 CDM projects have been registered with central CDM board by July 2008. GHG emissions from these projects are equivalent to 220 million tons carbon dioxide (CO_2). There are about 4,000 projects yet to be certified. These projects would reduce CO emissions by over 2.5 billion tons until the end of 2012. However, the previous adoption rate suggests that only a fraction of these projects will be certified. The current emissions of the EU-15 are about 4.2 billion ton CO_2 equivalent per year. The majority of CERs issued so far have been from HFC destruction

projects. There are only a limited number of such project sites globally, of which most if not all have already been converted into projects. The fastest-growing project types are renewable energy and energy efficiency.

In Bangladesh, through the CDM mechanism GHG emissions can be reduced in three major sectors, i.e. waste, forestry and energy. With the financial assistance from the government of Bangladesh and also from the foreign sources (South South North Network) Organizations/ NGO's namely Bikas, Grameen Shakti, Energy Pack and Waste Concern have been implementing several CDM projects. The government has already approved to establish 1,032,000 Solar Home Systems for off grid area of power transmission line in whole countries. Currently 295,000 households are using SHS's in Bangladesh which amounts to about 1 percent of the country's entire population.

The Major Environmental Problems of Bangladesh

Because of its geographical location, Bangladesh suffers from a range of environmental problems, arising from drought, flood and other natural hazards. Frequencies of hazards are on the increase day by day. The quality of soil has deteriorated due to reckless use of agrochemicals, unplanned land use, undesirable encroachment on forest areas for agriculture and settlements and indiscriminate disposal of hazardous industrial wastes. Unplanned land use and intrusion of saline water are causing degradation of soil in the coastal area.

The surface water of the country is polluted through capricious disposal of untreated industrial effluents and municipal waste water, runoff pollution from chemical fertilizers and pesticides and oil and lubes spillage in the coastal area from the operation of sea and river ports and ship wreckage. Now in Bangladesh, presence of high-level arsenic contamination in ground water is a national problem especially at Chadpur, ShaTakahira, Noakhali, Comilla, Gopalgonj and other district.

Bangladesh has 57 trans-boundary rivers, of which 54 are shared with India and 3 with Myanmar. A significant quantity of water flow is withdrawn and diverted upstream by neighbouring countries for irrigation and other purposes and thereby reducing normal flow of water. The Farakka Barrage on the river Ganges is a notable example. Desertification prevails in some northwestern areas of Bangladesh due to withdrawal and diversion of upstream water in the dry season by India. Besides, the proposed inter-basin river link project of India, if implemented, the annual water flow of Bangladesh will drastically decrease which will have profound negative impact on economy, society and environment of Bangladesh.

Air pollution is one of the man-made environmental disasters that is creating environmental hazard all over the world. There are two major sources of air pollution in Bangladesh, namely vehicular emissions and industrial emissions, which are mainly concentrated in the cities. There are also numerous brick-making kilns working in dry season all over Bangladesh, which is another source of air pollution. Almost all of these kilns use coal and wood as their source of energy, resulting in the emissions of sulfur-dioxide and volatile organic compounds. An emerging

issue of great concern in the cities and towns is the high concentration of lead in the air from vehicular exhausts. The high of concentration of lead is very harmful for human health especially for child health.

The depletion of biodiversity is the result of various kinds of human interventions that impinge on it through destruction and degradation of land, forest and aquatic habitats. These activities encompass the sectors of agriculture, forestry, fisheries, urbanization, industry, transport, tourism, energy, chemicals and minerals etc. In the fisheries sector, unplanned shrimp cultivation has negative impact on environment It has caused serious environmental damage that has harmed fish and other aquatic biodiversity significantly.

The Government Initiatives to Address Environmental Protection and Development

Bangladesh has limitations in resources and capacities in terms of technology or money to confront with massive environmental disasters. Therefore, the government of Bangladesh has been working relentlessly to develop and conserve environment to prevent major environmental disasters. Set out below the initiatives taken by the government to address environmental problems:

Preparation of National Land Policy

The optimum use of land and water depend on appropriate land use plan, water resources and natural environment are important sources of the growth of GDP. It is possible to ensure optimum use of scarce land resources by way of integrating the uses of these three natural resources. With this end in view, the government has approved 'National Land Use Policy, Bangladesh' in June 2001. The Government has adopted various other national policies and measures to prevent land depletion. Notable among them are 'The National Environment Policy', 'National Environment Act and Rules', 'National Forestry Policy' and 'The National Plan for Agricultural Research'.

National Water Policy

Water resources have been of immense importance of socio economic development of the nation. A good number of khals, buls and haors are scattered all over the country.

The National Water Policy was adopted in January 1999 to provide guidelines to all related Ministries, Agencies, Departments and non-government users and entrepreneurs including local organisations who are involved in water resources development, maintenance, water supply and water related services in the field of water resources management of the country.

Water Resources Planning Organization (WARPO) will centrally monitor the implementation of NWMP. WARPO maintains a National Water Resources Database (NWRD) established at WARPO under NWMP project that preserve and disseminate information/data of country's water sector including information/data of other related sectors. Important data analytical tools model and analytical tools, model and analyzed information are incorporated in this database. Different organization, universities etc. use data of NWRD in their planning and research works.

Control of Air Pollution

A good number of laws and regulations exist in the country to address air pollution. The DoE has been implementing a number of projects to control air pollution. Plying of two-stroke three-wheeler has been banned in Dhaka city since 1st January 2003. The government has introduced CNG driven four-stroke three wheelers and encouraging CNG powered automobile.

Five air quality monitoring stations has been set up at Dhaka, Chittagong, Khulna and Rajshahi under the Air Quality Management Project with the financial assistance of the World Bank. Two mobile air quality monitoring station has been procured to monitor local air quality regularly. The 7th Meeting of the Governing Council of the South Asia Cooperative Environment Programme (SACEP) held in 1998 adopted the 'Malé Declaration on Control and Prevention of Air Pollution and its Likely Transboundary Effects for South Asia'. The Department of Environment has undertaken steps for implementation of the above Malé Declaration in stages. Under its implementation plan a Transboundary Air Pollution Monitoring Station has already been set up in Shyamnagar upazila of the district of Satkhira and the monitoring programme is being run on a regular basis. Setting up of a second Transboundary Air Pollution Monitoring Station is being taken up.

The Bangladesh Agricultural University, Mymensingh is implementing a research project on 'Impacts of Ozone (O_3) on Crops' under this monitoring programme. The aforementioned research project has established adverse impacts of O_3 on crops. There is yet another research program in operation which is devoted to 'Assessment of Impacts of Air Pollution on Child Health' and is being run in three schools in the city of Dhaka. Publicity materials have been prepared for print and electronic media toward creating mass-awareness in checking air pollution.

Website has been opened for giving information and to create awareness among the people about air pollution. The Environment Conservation Rules, 1997 (ECR, '97) have undergone amendments through incorporation of relevant Sections toward effective control of various aspects of air pollution. Such amendments to ECR, '97 have made use of catalytic converters, oxygen catalysts and diesel particulate filters mandatory in petrol- diesel- and natural gas-driven vehicles.

Control of Pollution from Brick Klins

To contain air pollution, compressed system environment-friendly 'Block Brick' are encouraged instead of traditional bricks. Attempts are being made for demonstration and publicity of environment-friendly brick-burning technologies under the project 'Clean Air Sustainable Environment (CASE)' being implemented by the Department of Environment. A Draft Brickfield Policy has been formulated keeping in view effective implementation of the Brick-burning Act 1989 (Amended 1992 and 2001) and conservation of the environment simultaneously with meeting the demand of bricks in the country. Besides, steps are also underway toward implementing the decision to ban conventional brickfields by 2010.

To implement Brick Burning Control Act 1989, Brick Burning (Control) Rules 2004 have been framed.

Conservation of Ecology

Considering the importance of hills in protecting ecology of the country, the government has issued a notification in March 2002 banning hill destruction. Awareness about the importance of hills in protection of ecology is increasing and the illegal attempts of cutting/razing of hills are on the decline.

Industrial Pollution Control

In compliance with the Environment Conservation Act, 1995 and the Environment Conservation Rule, 1997, the mechanism for issuance of environmental clearance certificate has been introduced for the new industries or projects after assessing project area and pollutants to be emitted or discharged by the industries or projects to be set up. For the highly polluting industries, environmental clearance is given after setting up effluent treatment plant. Steps have been taken to set up effluent treatment plants for the existing industries with the support of Chamber and concerned sector-association.

With the above state of existing industries in background, an International ETP Fair was organized in Dhaka in September, 2007 for raising awareness and encouraging the various industrial entrepreneurs about constructing and establishing ETPs within their respective industrial premises. During a survey covering 11,149 industrial units conducted during 2002-2005, the Department of Environment had identified 524 falling under the Red Category as per ECR, '97. Among the above-identified 524 red-listed industrial units, 417 were found to have constructed their ETPs on their own initiative while 105 had no ETP at all. Besides, four enforcement teams constituted by the Department of Environment have been, since November, 2006, is inspecting various industrial units and taking legal measures against the polluting ones. Up to May 2008, the teams have inspected about 855 industrial units.

Currently, a UNEP-assisted project, titled, 'Survey and Mapping of Environmental Pollution from Industries in Greater Dhaka and Preparation of Strategies for its Mitigation' is being implemented. This project has been undertaken with a view to formulating and undertaking an action plan on accurate assessment of the number and pollution loads of the various industrial units operating in the greater Dhaka district and controlling pollution by them. The project has been designed to provide information regarding exact location of various industrial units, their types, dimensions, waste characteristics and whether or not they are run abiding the existing Acts, Rules and Regulations.

Control of Noise Pollution

As per the provision of the existing Environment Conservation Act 1995 which has set limit on noise pollution, the government has formulated the Noise Pollution (Control) Rules 2006. Under

these rules, it will be easier for the government to control noise pollution particularly the use of microphone and high level horn. The Ministry of Environment and Forest has fixed the target to reduce the level of sound pollution of Dhaka City form 90-110 decibel to 45-55 decibel by 2009-10. Recently Dhaka Metropolitan Police (DMP) has prohibited the use of horns on several city streets to check sound pollution.

Conservation of Biodiversity

Bangladesh signed the Biodiversity Convention at Rio in 1992. There is a focus on biodiversity in the forest and environment policy.

Under the Bangladesh Wildlife Preservation Act, 1974 (amendment Act 1994), three categories of protected areas have been established as national parks and wildlife sanctuaries. With an aim to conserve the biodiversity, conserve and develop natural environment and eco-tourism and to develop education and research, the Government of Bangladesh has declared 17 protected areas constituting about 245 thousands hectares of forest in different parts of the country. Moreover, the Government of Bangladesh has declared 8 areas viz. Cox'sbazar, Teknaf Sea Beach, St. Martin's Island, Sonadia Island, Sundarban reserve forests, Gulshan- Baridhara Lake, Hakaluki Haor, Tanguar Haor and Marjat Baor as Ecologically Critical Area (ECA) under Environmental Conservation Act, 1995. According to Ramsar Convention, the government has undertaken major development activities to conserve the biodiversities of wetlands including Tanguar Haor.

The Department of Environment with the assistance of Global Environmental Facilities (GEF) and UNDP is implementing a project titled 'Coastal and Wetland Biodiversity Management at Cox's Bazar and Hakaluki Haor' for conservation, management and sustainable development of coastal and wetland biodiversity at Cox's Bazar, Saint Martins Island and Hakaluki Haor. To involve local people in the activities 72 Village Conservation Groups (VCGs) have been formed in the project areas. In addition, ECA Coordination Committees have been formed in 3 Districts, 10 Upazillas and 22 unions to ensure involvement and coordination of other stakeholders for ECA management. Targets have been set to development of biodiversity through the protection of 201 endangered animals, 167 rare and endangered plant species. Protection of habitat for 25 important animals has been ensured. Various haor including Hakaluki Haor, one of the largest wetland (covering 40,000 Hectors of land) in the country, is getting back its bio-diversity following implementation of various programmes by the Ministry of Environment of Forest. In December 2007 126,851 birds covering 41 species visited haors, which is two and half time more than the year 2006

Besides, a part of the Sundarbans (east, west and south sites) and the Tanguar Haor have been designated as Ramsar sites. In addition, considering the importance of protecting biological diversity of the world, UNESCO has declared the Sundarbans, the single largest mangrove forest of Bangladesh, as World Heritage Site on 6 December 1997. Bangladesh Haor and Wetland

Development Board has published Bengali Calendar-1414 for publicity and protection of haors and wetlands.

Climate Change

Climate change has occupied the centre stage of all environment discussions in today's world. Bangladesh is one of the signatories of United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol.

According to the provision of UNFCCC, Bangladesh has sent the NAPA document to UNFCCC secretariat. Bangladesh presented NAPA in the sidelines of the eleventh conference of parties (CoP-11) held in Montreal, Canada, November-December 2005. The NAPA of Bangladesh earned appreciation from all quarters. Impacts of climate change include excessive flooding, increased salinity and drought, lack of drinking water and water logging due to the rise of sea level. 15 projects/activities have been proposed in NAPA aimed at raising country's capacity building for adaptation of climate change.

Least Developed Countries (LDC) Fund and Special Climatic Change Fund (SCCF) have been created by UNFCCC for adaptation of climate change as well as mitigation issues for the least developed countries. US $115 million and US $61.5 million have been deposited in this fund.

Till March 2008, US $13.52 million and US$ 36.14 Million have been allocated from LDC and SCC fund for various projects. Bangladesh has been trying to receive fund from LDC and SCC for Implementing NAPA related projects /activities.

The Second United Nations Climate Change Conference was held in Bali, Indonesia during 3-15 December, 2007 which was attended by 10.800 delegates from various countries and international organisations. Meetings of COP 13/MOP 3 during the above Conference had decided upon initiating adaptation fund programmes. The Bangladesh delegation had played an important role in adopting the decision. Developing countries, hopefully, will receive the maximum financial assistance from the adaptation fund in addressing climate change issues.

Protection of Ozone Layer

Bangladesh has achieved remarkable success in protecting of ozone layer. By now, Ozone Depleting Substances (ODS) has been phased out from aerosol sector in Bangladesh. As a result, 60 percent use of ODS has been reduced in the country. Besides, in the refrigeration sector, industry-owners and technicians have been provided with necessary equipment and machineries including imparting training to around 2000 technicians under the project on recovery and recycling toward checking unnecessary emission of cloro-floro-carbon (CFCs).

Ozone Depleting Substances (Regulation) Rules, 2004 has been enacted under which import and use of ODSs are being controlled through licensing systems. A plan has been drawn up and undertaken toward 100% reduction of CFC-use in the form of CFC-11/12 in Refrigeration and Air-conditioning Sector by 01 January, 2010 through the project National Phase-out Plan being

implemented in the Department of Environment to reduce emission of ODS gases from refrigeration sector. Necessary equipments and training have been provided to the sector. To control import and export of ODS; a set of rules titled Ozone Layer Depleting Substances (Control) Rules 2004 has been framed. Through the national phase out plan, the use of 100% CFC would reduce from refrigeration sector by the year 2010.

Publication of Dhaka City State of Environment report

The DOE has published Dhaka City State of Environment report with financial assistance from UNEP: Beside a report on Bangladesh National Programme of Action for protection of the coastal and marine environment from land based activities have been published.

Development of the National Bio-safety Framework

The Department of Environment is implementing development of the national bio-safety framework project with the financial assistance from Global Environment Facility (GEF).

Steps Taken for Management of Hospital/Clinical Waste

For environment-friendly management of Hospitals' Clinical wastes in Dhaka city, the DoE and Bangladesh Private Clinic and Diagnostic Owner's association are working closely. By now, many hospitals and clinics in Dhaka city have developed management system of waste disposal by receiving consultancy support from the DoE.

The government is working for production of power and compost from waste. Technical assistance has been provided to DCC for taking CDM projects, which generate power and compost from urban waste. With the support of JICA, Dhaka City Corporation has undertaken a 20- year master plan for waste management. With the financial assistance of UNCRD, Department of Environment prepared a project called National Strategy on Waste Reduce, Reuse and Recycle. At present, preparation of 3R strategy is in process.

Natural Disaster Management

Various government and non-government organizations are working in the field of disaster management and mitigation. The focal point for disaster management is the Ministry of Food and Disaster Management and the Disaster Management Bureau under the Ministry. The Bangladesh Meteorological Department (BMD) is responsible for forecasting natural disasters, particularly cyclones, droughts, storms etc. The Bangladesh Space Research and Remote Sensing Organisation (SPARRSO) is responsible for providing satellite images while the Flood Forecasting and Warning Centre (FFWC) of Bangladesh Water Development Board is entrusted with the responsibility of forecasting flood.

A numbers of institutions and Bureaus under different ministries such as the Directorate of Relief and Rehabilitation, the Directorate General of Food, Department of Public Health Engineering, The Local Government Engineering Department, Water Resources Planning Organisation and Armed Forces Division are involved in disaster management. To increase awareness of disaster

risk management, the government has taken up mass programme like media award for reporting in risk management in newspapers and electronic media, advocacy workshop for micro-credit use in disaster control etc. Moreover, three national committees have been working to administer disaster management effectively.

Besides the national disaster management committee, the following committees are also functioning:

(a) Cyclone Preparedness Programme Implementation Board (CPPIB)

(b) Disaster Management Training and Public Awareness Building Task Force (DMTATF)

(c) Focal Point Operation Coordination Group of Disaster Management (FPOCG)

(d) NGO Coordination Committee on Disaster Management (NGOCC)

Other than the district disaster management committee, Upazila disaster management committee, union and pourashava disaster management committee and city corporation disaster management committee have been constituted at sub national levels to coordinate, review and implement the disaster management activities within their area of jurisdictions.

Tsunami and Bangladesh

Tsunami is a dual natural disaster. A series of very long waves are generated by Tsunamis as a result of rapid and large scale disturbance in the sea. Most tsunamis are generated by sea floor displacements from large undersea earthquakes.

It is very hard to escape from the violent disaster caused by tsunami; but it is very important to create public awareness, improved tsunami detection, mitigation and warning system for avoiding large scale destruction of life and property. Experts suggest the following protective measures:

1. Update available information on cyclone shelter management for tsunami preparedness.
2. Prepare a tsunami inundation risk map for the entire coastal region using available data.
3. Identify tsunami vulnerable schools, hospitals, and other important buildings in the coastal area and assess their capacity after tsunami disaster.
4. Identify and appraise economic risk exposure of coastal livelihoods (e.g. fishing/ tourism) to tsunami.

Activities of NGOs to Protect Environment

Along with government, a good number of NGOs have been working to face environmental problems and to improve environmental system of the country since 1980s. The NGOs play an important role in motivating people at grass root level to protect environment and to take coordinated efforts in solving environmental problems. Some of the important NGOs are: International Union for the Conservation of Nature (IUCN), Centre for Sustainable Development (CSD), Bangladesh Centre for Advanced Studies (BCAS), Environmental Conservation

Management Centre, Waste Concern, Bangladesh Paribesh Andolon (BAPA) and Bangladesh Environmental Lawyers' Association (BELA).

Policies and Laws for the Development and Protection of Environment

The DoE has been working not only for protection of environment of the country but also formulating requisite laws and responsible the implementation of the conventions, protocols and agreements signed on environmental protection at international and regional level. This calls for creating mass awareness and legal obligation. With this end in view, the following policies and laws have been framed:

The Environmental Policy, 1992: In order to provide appropriate guidelines at national level in tandem with maintaining the momentum of development programmes, the government formulated the Environmental Policy in 1992. The policy covers 15 sectors of the economy including agriculture, fisheries, education, communication and health.

The Bangladesh Environment Conservation Act, 1995: Recognizing the need for a legislation to facilitate the conservation of environment, improvement of environmental standards and control and mitigation of environmental pollution of the country, an Act titled 'The Bangladesh Environment Conservation Act, 1995' was passed by Parliament. While implementing the Act along with establishment of Environment Courts for the trial of cases against the person(s) responsible for environmental pollution, it was felt necessary to bring certain amendments. Accordingly necessary amendments to the 'Bangladesh Environment Conservation Act, 1995' were made. 'The Bangladesh Environment Conservation (Amendment) Act' was passed by the Parliament on April 6, 2000.

The Environment Conservation Rules, 1997: The Environment Conservation Rules, 1997 have been formulated to fulfill the objectives of 'The Bangladesh Environment Conservation Act, 1995' for the conservation of environment, improvement of environmental standards and control and mitigation of environmental pollution.

The Environment Court Act, 2000: 'The Environment Court Act, 2000' had been passed by Parliament on April 6, 2000 for the establishment of environmental courts for the trial of offences relating to the environmental pollution and matters incidental thereto. Under this Act, one Environment Court will be established in each Division. Besides, one or more Environment Appeal Courts will be established. The Environment Appeal Court will be constituted with one judge. In the mean time, two Environment Courts have been established in Dhaka and Chittagong and an Environment Appeal Court has been set up in Dhaka.

The Department of Forest

Forest Department is playing an important role in the development of physical, socio-economic development, maintenance of environmental balance and sustainable land based production system. The forest management system of Bangladesh is an age-old system. At the beginning, the main task of the forest department was to protect the forest and to ensure sustained yield

management. The Sundarban Mangrove Forest of Bangladesh is the largest compact mangrove forest (Bangladesh alone contains 6017 sq.km. out of 10,000 sq.km.) of the world. The management of Sundarban Mangrove Forest started as early as 1884. The Forest Division of Chittagong region and Chittagong Hill Tract region started forest management in 1871 and 1925 respectively.

The Development activities of the Forest Department in FY 2007-2008 includes:

1) Distribution of benefits among the participants involved in the social forestry programme.
2) 'Tree Farming Fund' has been created to make the social forestry programme sustainable

It has undertaking several projects to protect bio-diversity. These include (a) Establishment of Botanical garden and eco-park at Sitakunda (2nd Phase), Chittagong. (b) Establishment of Tilagar and Barshijora eco parks at greater Sylhet district. (c) Further development of Dulahajra Safari park, at Cox's Bazar, (d) Establishment of Dhanshiri eco park and Ramsagar National park development. (e) Integrated reed-land social forestry project in Sunamganj district (f) Establishment of Kuakata eco-park at Kalapara upazila in Patuakhali district (g) Establishment of Modhutilla eco-park at Sherpur district (h) Social forestry for development and management of forest resources (i) and Creation of Agar garden (1st Phase) project.

Social Forestry

Social forestry programme is one of the important programmes of the Forest Department. Since 1981, the Forest Department implemented four social projects with the financial assistance of Asian Development Bank (ADB). Currently along with the social forestry programme for development and management of forest resources, the forest department to also implementing forest development programme for poverty reduction.

Through different social forestry projects 56484 ha. encroached and degraded forest area has already been bought under social forestry. In addition to this, 47000 km. strip plantations have been raised under social forestry programme and more than 4 lakh poor people become the active participants of this project.

After joining the plantation programme, the social restrictions on women employment has largely been removed. Social forestry is not only producing wood, fuel-wood, and improving environmental condition, it is also playing a significant role in reducing poverty. The poverty reduction programme through social forestry is consistent with PRSP.

Besides a MIS to manage PBSA (Participatory Benefit Sharing Agreement) information has been prepared under forestry sector project completed in June 2006. Currently, the Forest Department has been utilizing MIS, GIS and internet technology to manage information efficiently for making informed decisions for better management of forest resources.

Nishorga Support Project (NSP)

Bangladesh Forest Department at the beginning of the new century has initiated a new project titled Nishorga Support Project with financial assistance of USAID. The objective of this 5 year project (from 2004-05 to 2008-09) with a total cost of Tk. 62.09 crores is to save the remaining natural forests of Bangladesh for our future generation. The forest department believes that the success of this project depends on the involvement of people with the project. So the forest department plans to develop a co-management system with the involvement of local people for protection of natural forests. In this system people living in and around natural forests will work together with the department for protection of natural forests and nature. The government and local people involved in implementation of the programme will also share income (if any). Currently this co-management system is being implemented at five natural forest areas namely Lawachara of Moulvibazar, Rema-Kalenga and Satchari of Hobiganj, Chunati of Chittagong and Teknaf of Cox'sbazar on experimental basis. 8 co-management council and committee has been formed with the representative form local elite, non-government organizations and local people from various groups. The positive impact of establishment of co-management councils has been observed in forestry management including increasing wild life habited birds and magnificence greenery. This system will be extended gradually to other natural forest areas.

Barind Environmental Balance Restoration Through Aforestation Project

The north-west part of Bangladesh i.e. Barind area is an area where agro-ecological condition, topography and soil characteristics are significantly different from other parts of the country, and where the forest coverage is very low. Consequently temperature is high, rainfall minimum and surface water is scare in this part of Bangladesh. Barind Multipurpose Development Authority (BMDA) is implementing comprehensive development programme such as irrigation, surface water development, feeder road construction, drinking water supply to strengthen the socio-economic condition of the people of this area.

For environmental improvement of the Barind area, the government is implementing "Barind Environmental Balance Restoration through Afforestation" project with a total cost of Tk. 25.52 crores under the Ministry of Environment and Forest. The project has been taken up for implementation in July 2006 and slated for completion in June 2010.

Bangladesh National Herbarium (BNH)

Bangladesh National Herbarium is a national research organization meant for conducting botanical survey. One of the main objectives of National Herbarium is to identify, collect and preserve all plant species including those associated with national traditions and culture. Some of the important activities of Bangladesh National Herbarium are stated below:

- Botanical Survey: About 800 plant specimens have been collected through botanical survey from the forest areas in the districts of Chittagong, Bandarban, ShaTakaira, Kurigram,and Dinajpur since July2007.
- Plant Identification and Publication of the Flora of Bangladesh: Through taxonomic studies about 800 plant species were identified by the scientific staff of the National Herbarium since July 2007. Besides, as many as 200 plant species on request from various government and non-government organisations have been identified. Under the Taxonomic studies carried out at the National Herbarium, manuscripts of seven Angiospermaic families have been compiled for the publication of the series 'Flora of Bangladesh'.

Apart from this, BNH is actively engaged in the implementation of the programme on the Encyclopedia of flora and fauna of Bangladesh sponsored and implemented by MOEF and Bangladesh Asiatic Society. The programme would be completed end of 2009.

Bangladesh Forest Research Institute (BFRI)

BFRI is the only national forest research organization. The main objective of BFRI is to augment and preserve forest resources through scientific use and innovating new technologies for environmental development. The objectives also include poverty reduction and employment generation.

The technologies recently developed by BFRI include:

- ► Technique for bamboo groove management.
- ► Technique for coppice management and its rotation age to increase the productivity of fuel wood species.
- ► Appropriate technologies for hill farming for Chittagong Hill Tracts to ensure efficient use of hill land and soil conservation.
- ► Guidelines for collection and production for improved quality seeds
- ► Site specific tree plantation.
- ► Clonal propagation technique for hybrid ecasia and syzygium grande
- ► Tissue culture technique for bamboo and hybrid ecasia
- ► Identification of profitable rotation of important tree species.
- ► Utilization of rubber wood for furniture making and other usage

Bangladesh Forest Industries Development Corporation (BFIDC)

The main objectives of BFIDC include extraction of forest produces (timber) from the forests of the country, establishments of timber based industries, rubber plantation, productions, processing and marketing, best utilization of forest resources and processing of the extracted timber. The activities of BFIDC are divided into two sectors, namely (a) Industrial sector, and (b) Agriculture sector

Under BFIDC, there are three rubber zones and sixteen rubber gardens comprising 32635 acres of forest land. These are yielding profits.

In FY 2006-07, the profit amounted to Tk. 24.07 crores which rose to Tk. 33.91 crores in FY 2007-08.

Moreover BFIDC meets up about 70 percent of total demand of raw rubber of the country.. Rubber production cost is also less, and therefore it is remarkably profitable. Quality and standard of rubber wood as tested are very close to those of teak (Segun) wood.

A massive action plan has been taken to modernise BFIDC. Some notable features of the action plan are mentioned below:

a. Manufacturing of modern doors, windows and household wooden items to meet the local demand and to face the market competitiveness by modernizing the existing Industrial Units;
b. Modernisation of factories and smoke-houses, creation of armed guards for rubber sector to protect theft/trafficking, infrastructure development and re-plantation of 5332 acres rubber garden by FY 2008-09.
c. Formulation of National Rubber Policy;
d. Alleviation of poverty of the rural poor people by expansion of rubber cultivation in private/public sector especially in the hilly areas of Bangladesh include Modhupur, Sylhet and Chittagong tracts.

Annual Development Programme

The Ministry of Environment and Forest implemented 31 projects in FY 2006-07 with an RADP allocation of Taka 96.72 crores. During FY 2007-08, the Ministry implemented 35 projects with an ADP allocation of Tk. 97.18 crores. Besides these, 8 development programmes financed from non-development budget were under implementation at a cost of Tk. 8.25 crores. Apart from these projects or programmes which are directly related to the development of environment and eco-system, some other line Ministries notably Ministry of Water Resources, Ministry of Agriculture, Ministry of Food and Disaster Management, Ministry of Fisheries and Livestock etc. are also involved in executing environmental development projects. Besides these inclusion of EIA (Environment Impact Assessment) has been made mandatory for all new DPP/TPP taken up under the public sector. Development activities of every project aimed at putting in a sustainable eco-system of the country through protection of environment.