

## **CHAPTER 15**

### **ENVIRONMENT AND DEVELOPMENT**

In the context of recent realisation of the interdependence of development and environment, it is seriously felt that the striving for achieving economic prosperity be commensurate with the deliberate efforts in keeping environmental and ecological balance. Belatedly it is now appreciated that the environmental problem is also an economic issue indeed. For these reasons, there is no scope to visualise economic and environmental activities in isolation. An integrated approach is, therefore needed for the sake of efficient management of environmental resources.

#### **Economic Growth and Environment**

Conventionally economic growth implies the 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. But 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.

In 1993, the United Nations Statistical Office (UNSO), first considered environment as an important variable and developed the System for Environment and Economic Accounts (SEEA). In this system, an attempt has been made to integrate environmental data with the existing national accounts information. Using this, an Environmentally Adjusted Net Domestic Product (EDP) and an Environmentally Adjusted Net Income (ENI) are calculated. In calculating SEEA, environmental assets such as land, forest, water, biodiversity etc. are considered as productive assets relating to consumption and production. Similarly, other additional costs are also included in SEEA. Included among them are costs of imputed changes for the depletion of minerals and other natural resources and costs of degradation of land, water, air caused due to the production and consumption activities.

#### **Global Environmental Movement**

The Stockholm Conference is considered as a milestone in the emergence of global environmental movement. Held in 1972, the Conference 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 1997. 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 Earth Summit**

In observance of the 20th anniversary of the Stockholm Conference, the United Nations organised the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, in June 1992, which is popularly known as the 'Earth Summit'. The Summit drew as many as 10,000 delegates and a large number of non-governmental organisations from 178 countries. The Rio Summit came to a consensus on The Rio Declaration of 27 principles, Agenda 21 and The Statement of Forest Principles documents.

Moreover, consensus has also been reached on the following two conventions:

1. Convention on Bio-diversity and
2. Convention on Climate Change Framework

UN Commission on Sustainable Development (UNCSD) has been set up to monitor the implementation progress of the decision taken in the Rio Summit.

### **World Summit on Sustainable Development (WSSD)**

In order to assess the progress of the implementation of sustainable environmental development as agreed in the Earth Summit and to determine future work plan, the World Summit on Sustainable Development (WSSD) was held at Johannesburg in September 2002. The cardinal objectives of the Summit are:

- Focus on accomplishments and areas where further actions were needed for fuller implementation of Agenda 21. Also review the problems and prospects of other Agreements of Rio Summit and the new issues emerged within the framework of Agenda 21.
- Ensure a balance between economic development, social development and environmental protection as interrelated issues and mutually reinforcing components of sustainable development.

The WSSD summit is said to be successful in the sense that the Summit has created special opportunities to draw appropriate work plan and pledge to implement the issues agreed in Rio Summit.

### **Kyoto Protocol**

The Kyoto Protocol signed to reduce carbon-di-oxide and greenhouse gas emission that is responsible for increasing global warming, meltation of avalanche and rising sea level has come into force on 17 February 2005. The Protocol has been signed by 141 countries. In December 1997, the negotiations on the Kyoto Protocol under the United Nations Convention on Climate Change Framework were completed. The Kyoto Protocol put the 39 industrialised nations under obligation to meet specific legally binding targets for emissions of six-greenhouse gas i.e. carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride emission by 5.2 percent below 1990 levels, between 2008-2012. According to the Kyoto protocol

39 countries have obligation to reduce green house gases (GHG) emission below that at the 1990 level. It may be mentioned that compare to developed countries, 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 afforestation. Activities that absorb carbon, such as planting trees facilitate low level of emission of greenhouse gas.

#### **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. It is estimated that 4400 million tons of carbon dioxide (CO<sub>2</sub>) equivalent has to be reduced by industrialized countries (Annex-I-countries). Based on the available data, so far 84 CDM projects, have been developed and traded by different countries till April 2004. Ministry of Environment and Forest formed national CDM board and national CDM committee. In Bangladesh through the CDM mechanism GHG emissions can be reduced in three major sectors, i.e. waste, forestry and energy. With financial assistance from Government of Bangladesh and foreign (South South North Network) Organisations/ NGO namely Bikas, Grameen Shakti, Energy Pack and Waste Concern have been implementing some CDM projects.

#### **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. Frequency of hazards are on the increase day by day. The quality of soil has deteriorated due to wanton 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. The arsenic concentration in the ground water in many areas is a major problem in Bangladesh now. The problem is acute in shallow tube wells extracting groundwater from 10 m to 100 m depth in the Southeast, South Central (the northern part only), and Southwest regions, which creates problems for getting safe drinking water in rural life.

Bangladesh has 57 trans-boundary rivers, of which 54 are shared with India and 3 with Myanmar. A significant amount 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 be drastically decreased which will have profound negative impact on economy, society and environment of Bangladesh.

Air pollution is one of the manmade environmental disasters that is taking place all over the world. There are two major sources of air pollution in Bangladesh, 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-di-oxide 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 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, urbanisation, industry, transport, tourism, energy, chemicals and minerals etc. In the fisheries sector, shrimp cultivation has become a major concern during the past decade. It has caused serious environmental damage that has harmed fish and other aquatic biodiversity significantly. It is apprehended that the climate of Bangladesh may get warmer and wetter owing to global warming. The most serious consequences of climatic change for Bangladesh will be a rise in sea level along the Bay of Bengal coasts, causing inundation and submerging of 10 to 20 percent of the coastal land including the Sundarbans, as well as saline intrusion in the rivers, affecting millions of people.

### **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. For this reasons the Government has been working relentlessly to develop and conserve environment for preventing vast 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. Land, 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. There exist other national policies and measures that have positive impact on efforts 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**

Various government agencies have been working to address the problems arising from water pollution and water scarcity. The Department of Environment (DoE) is responsible for addressing pollution related issues and the Ministry of Water Resources, Ministry of Communication,



Ministry of LGRD and Co-operatives, Ministry of Agriculture and the Agencies under them are responsible for resolving the problems of water pollution and water scarcity.

- The National Water Policy has been 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.

DoE has been collecting data on surface water quality since 1980, at different points of the rivers in Bangladesh. Currently, DoE is monitoring water quality data at 80 stations. Some stations are designated as Global Environmental Monitoring System (GEMS) points. The results collected from these points are transmitted to Nairobi, Kenya, as part of an international commitment of the government of Bangladesh.

### **National Water Management Plan (NWMP)**

To ensure proper, integrated, effective and sustainable use of country's water resources NWMP was prepared in November 2001 in the light of National Water Policy. The NWMP was approved by the National Water Resources Council (NWRC) on 31st March, 2004.

With the financial assistance from World Bank, the NWMP has been implemented. During formulation of the NWMP the issues have been taken into account in the context of socio-economic, environmental, state of water supply and demand and the overall framework of technical aspect. In the NWMP a total of 84 programmes in next 25 years have been proposed for the whole country for implementation under short-term (1-5 years), medium-term (6-10 years) and long-term (11-25 years) planning.

### **Control of Air Pollution**

There exists a good number of laws and regulations in the country to confront air pollution. The DoE has been implementing a number of projects to control air pollution. In view of the heightened awareness of the dangers of lead pollution, the Government executed the decision of providing only lead-free gasoline in the country since July 1999. To control air pollution, the Government has amended Environment Conservation Rules 1997 with new rules under which the use of catalytic converter, oxidation catalyst and diesel particulate filter has been made mandatory respectively in petrol, diesel and CNG driven vehicles. Plying of bus, minibus, microbus, taxi which is more than twenty years old and truck, mini-truck, tank lorry and van which are more than twenty five years old has been banned since 1<sup>st</sup> January 2002. Plying of two-stroke three-wheeler has been banned in Dhaka city since 1<sup>st</sup> January 2003. The Government has introduced CNG driven four-stroke three wheelers and encouraging CNG driven automobile.

A continuous Air Quality Monitoring Station has been set-up in the premises of National Parliament under the Air Quality Management Project with the financial assistance of the World Bank. From this station vehicular emission is being monitored regularly against different parameters PM<sub>10</sub> and PM<sub>25</sub> to get various information on the status of the air quality of Dhaka City.

Under this project two air quality monitoring stations at Khulna & Rajshahi will be set up. Initiatives have been undertaken for the procurement of two mobile air quality monitoring stations to monitor local air quality regularly. A website has been opened for giving information and create awareness to the people about air pollution. According to the ECR-97 schedule-2 air quality standard has been revised. Analysis of the available data suggests that particulate matter is the main factor of air pollution and its quantity is on the increases. Under this project, inspection of the motor vehicle emission in Dhaka city is being monitored regularly. About 3000 diesel/ petrol/octane/ CNG driven motor vehicle has already been monitored. By analysing the monitoring data motor vehicle emission standard has been amended and schedule 6 of ECR-97 has been replaced. According to the amended motor vehicle emission standard activity of mobile court is operating in Dhaka city regularly.

World wide survey report reveals that some most polluting vehicles among the vehicles are actually accountable for the major portion of air pollution. A survey of the United States indicates that 20 percent motor vehicles are accountable for 80 percent pollution. A World Bank survey report, 2000 states that diesel driven motor vehicles are accountable for 44 percent particulate matter and 85 percent nitrogen oxide pollution of air in Dhaka city. Black smoke emission from diesel engine is the indicator of discharging of higher quantity of particulate matter.

The main objective of the air quality improvement of Dhaka city is the reduction of particulate matter concentration. Presently emission from the diesel engine is the main source of particulate matter after the ban of two stroke engine. It is possible to improve the air quality of Dhaka city by controlling the emissions from diesel engine only

#### **Control of Pollution from Brick Klins**

To protect the air pollution, compressed system environment-friendly 'Block Brick' are encouraged instead of traditional bricks. In the mean time, installing permanent chimney with the height of 120ft. has been made mandatory for traditional brickfields. Setting up of traditional brickfields (120ft. height permanent chimney) along with zigzag chimney brickfields and Vertical Shaft Brick Klin Chimney brickfields are encouraged. To implement Brick Burning Control Act 1989, the activities are underway to formulate Brick Burning (Control) Rules 2004 are being formed.

#### **Conservation of Ecology**

Considering the importance of hills in maintaining ecology, the Government issued a notification in March 2002 banning hill cut. From now on, one has to receive clearance from the Government if hill cutting and/or razing becomes necessary for the sake of public interest. To motivate people against hill cutting and/or razing, mass awareness campaign were carried out with the help of public representatives and local administration in Chittagong and Sylhet hill areas. People from all walks of life took part in the awareness campaigns. The level of awareness about the importance of hills in maintaining ecological balance is increasing and the illegal attempts to hill cutting/razing are decreasing.

## **Industrial Pollution Control**

In compliance with the Environment Conservation Act, 1995 and the Environment Conservation Rule, 1997, the Government now issues environmental clearance certificate 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. Initiatives have been undertaken to set up effluent treatment plants for the existing industries with the support of Chamber and concerned sector-association. 'Programmes to Save Dhaka' has been undertaken to save the surrounding rivers of Dhaka. As part of the implementation programme, the existing tanneries of Hazaribagh will be shifted to Horindhara, a place in between Savar and Keranigonj Upazila. A central effluent treatment plant will be setup in the said leather industry. A demonstration project to treat liquid industrial waste by using low cost local resources has been completed at Madhabdi, Narshingdi which drew attention of the industrialists.

## **Control of Noise Pollution**

Following the existing Environment Conservation Act 1995, the Government drafted the Noise Pollution (Control) Rules 2004 and sought opinion on the draft rule from all walks of life. The rule is now in the process of finalisation in the light of the comments. Once the proposed rules are in place, it will be easier for the Government to control noise pollution particularly the use of microphone and high level horn.

## **Conservation of Biodiversity**

Bangladesh signed the Biodiversity Convention at Rio in 1992. A focus on biodiversity has been emphasised in the forest and environment policy. However, a separate policy on biodiversity is yet to be formulated and until then various departments of the Government will be working for conservation of biodiversity within the existing rules and regulations. Some of the important rules and regulations are: the Protection and Conservation of Fish Act and Rules, the Marine Fisheries Ordinance, Wildlife Preservation Act, Forest Act, the Environment Conservation Act and Rules etc. The Bangladesh National Biodiversity Strategy and Action Plan is under preparation as a national obligation to the Convention on Biodiversity.

Under the Bangladesh Wildlife Preservation Act, 1974 (as amended up to 1994), three categories of protected areas have been established as national parks and wildlife sanctuaries. With an aim to preserve the biodiversity, conserve and develop natural environment and eco-tourism and to develop education and research, the Government of Bangladesh has declared 16 protected areas constituting about 245 thousands hectares of forest in different parts of the country. Moreover, the Government of Bangladesh has declared 6 areas viz. Cox's Bazar, Teknaf Sea Beach, St. Martin's Island, Sonadia Island, Hakaluki Island, 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.

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

### **Climate Change**

Climate change is the much talked issue of the day across the globe. Bangladesh is one among the signatories of United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol. Bangladesh formulated Initial National Communication in 2002 with the financial assistance of GEF-UNDP under UNFCCC and submitted it to the UNFCCC Secretariat. The Initial National Communication includes Green Gas Inventory, Vulnerability and Adaptation, Mitigation and Climate Change Action Strategy. With the financial assistance from GEF-UNDP, the Government has undertaken activities to formulate National Strategy to combat climate change. A Climate Cell has been formed in the Department of Environment to take up coordinated strategy in local and national level about climate change related activities under comprehensive disaster management programmes being implemented under the Ministry of Food and Disaster Management

An international workshop titled National Adaptation Programme of Action (NAPA) was organised in Dhaka in 2002. Representatives from 42 developing countries participated in the workshop. As per resolution taken in the workshop, the Government of Bangladesh is implementing a project titled 'Formulation of the Bangladesh Programme of Action to Climate Change' with the financial assistance from UNDP-GEF. The main features of the project are:

- (a) To identify weather parameters such as change of temperature, rainfall and natural disaster like floods, drought and cyclones etc.
- (b) To identify what initiatives have been taken to face existing problems.
- (c) To identify appropriate action oriented programmes, and
- (d) To formulate programmes and strategies addressing future problems

According to the provision of UNFCCC, Bangladesh has sent the NAPA document to UNFCCC secretariat. Bangladesh presented NAPA in the side event of eleventh conference of parties (CoP-11) held in Montreal, Canada in November-December 2005. The NAPA of Bangladesh earned appreciation from all quarters. The impact impacts of climate change include excessive enhanced salinity and drought, lack of drinking water and water logging due to sea level rise. 15 projects have been proposed in NAPA with a view to enhance capacity building for adaptation of climate change.

A fund has been created by UNFCCC for adaptation with possible climate changes for the least developed countries. An amount of US\$ 30 million deposited in this fund. It is expected that US\$



2 million would be available by 2006 for the proposed projects/activities of NAPA. Besides this, initiative would be taken for financing project implementation through bilateral agreement.

LDC-GEF consultation meeting was held in Dhaka on 4-6 April, 2006 regarding LDC's fund. Seventy delegates comprising 50 LDC's attended the meeting, including national UNFCCC focal point, representative from LDC's expert group, GEF, UNEP, UNDP and World Bank. Representatives from the developed countries also attended the meeting.

The main objectives of the meeting was to step up negotiation between LDC and GEF to discuss the role of LDCs fund for the adaptation of climate change.

### **Protection of Ozone Layer**

Bangladesh has achieved remarkable success in protection 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, to reduce emission of ODS gases from refrigeration sector, necessary equipment and training has 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 formulated.

### **Bangladesh: Preparation of the Persistent Organic Pollutants (POPs) National Implementation Plan under the Stockholm Convention.**

As a signatory to the Stockholm Convention on POPs, Bangladesh has formulated National Implementation Plan to protect use or phase-out of POPs.

### **Publication of Dhaka City State of Environment report**

The DOE has recently published and distributed Dhaka city state of environment report with financial assistant from UNEP.

### **Development of the National Biosafety Framework**

The Department of Environment is implementing Development of the National Biosafety Framework Project with financial assistance from Global Environment Facility (GEF). Steps have been undertaken to formulate National Biosafety Framework in keeping with Cartehena protocol under this project.

### **Initiatives Taken for Management of Hospital/Clinical Waste**

For environment-friendly management of Hospital/Clinical wastes in Dhaka city, the DoE and Bangladesh Private Clinic and Diagnostic Owner's Association are working closely. By now, many Hospital and Clinics in Dhaka city have developed management system of waste disposal by receiving consultancy support from the DoE. The Ministry of Health is formulating Biomedical Waste Management Act with support from Ministry of Environment and Forests. The DoE has undertaken a project titled 'Training on Environmentally Sound Management of Biomedical Waste in Dhaka City, Bangladesh Basel Convention' for environment-friendly management of clinical wastes in Dhaka city. Doctors, nurses, technicians and relevant individuals will be provided with training on environment-friendly management of clinical wastes under this project.

The government is working in the waste management for production of power and compost. Dhaka with a population of above 10 million, generates about 5000 tons of solid waste everyday. Presently, Dhaka City Corporation (DCC) collects and disposes approximately 42 percent of the solid waste. Around 16 percent of the solid waste is recycled, mostly by the informal sector (households, hawkers, waste pickers) and a significant 50 percent is thrown in to streets, drains, ditches, canals and open spaces thus contributing to the deteriorating quality of life and environment in these cities. DCC now spends Tk. 2660, for collection and transportation of one metric ton urban waste

According to the World Bank, it is estimated that by the year 2025 urban areas of Bangladesh would generate 47,064 tons of waste everyday. Technical assistance have been provided to DCC for taking CDM projects, which generate power & compost urban waste. DCC has earned recognition from home and abroad for implementing CDM projects through Waste Concern and sustainable environment management activities of the Ministry of Environment and Forest.

Besides, with the financial assistance from UNDP, the MOEF has undertaken Sustainable Environment Management programme. Under these programme, initiatives are taken for community based solid waste management, community based urban solid waste processing and community based management for dyeing waste of small textile mills in rural areas.

### **Environmental Education**

The Government with the support of UNDP has incorporated environmental issues in the curriculum of the general, madrasah and technical education streams of the institutional educational system under the project titled 'Primary and Secondary Level Environment Curricula'. Besides, activities are underway to prepare training manual and learning materials for the teachers.

### **Measures taken to meet Natural Disasters**

There are various government and non-government organisations, working in the field of disasters 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.

Among the natural disasters, flood is a recurrent phenomenon in Bangladesh. The Government has taken both structural as well as other different initiatives for flood mitigation. With the assistance of the World Bank, a Flood Action Plan (FAP) was undertaken immediately after the unprecedented flood of 1988. Besides, the government by using its own and external resources has so far constructed more than two thousand cyclone and flood shelters for evacuation of people threatened by cyclone or flood.

The Flood Forecasting and Warning Centre (FFWC) of Bangladesh Water Development Board are working through 67 SSB wireless stations. At present out of 14 installed experimental telemetries station 7 telemetries station are in operator. Data of river water level in 86 gaze stations and information on rain fall from 54 rain fall stations are collected through existing network. This centre directly collects satellite images from National Oceanic and Atmospheric Administration (NOAA), USA satellite station. Besides, the centre also collects radar cloud and GMS satellite images regularly and gives flood forecasting country wide. In addition, green belt projects have been implemented to protect coastal land from inundation by tidal waves and storm surges. Bangladesh Red Crescent Society has been operating Cyclone Preparedness Programme (CPP).

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

A guideline formulated through the project namely guidelines for Environmental Assessment of Water Management (flood control, drainage and irrigation) would be used EIA for FCD & FCDI projects. After approval of the MOEF on October 2003 the Ministry of Water Resource has published this guidelines on February 2005. According to guidelines, FCD and FCDI projects would be prepared, reviewed and approved.

### **Integrated Coastal Zone Management Plan (ICZMP)**

Nineteen districts of the southwest of Bangladesh are directly or indirectly influenced by the environment of the coastal belt. The people of this area are in need of developed communication infrastructure, flood and water logging management, social and economic development and establishment of favourable institutions. In this respect, for the purpose of integrated development of coastal areas 'Integrated Coastal Zone Management Plan (ICZMP)' project is being implemented with the support of Royal Netherlands Embassy (RNE) and UK Department for International Development (DFID) along with contribution of the Government of Bangladesh (GoB). The duration of the project is February 2002 to June 2006. The core objectives of the project are as follows:

- Supporting responsible and sustainable resource management;
- Developing unrealised resource potential;
- Developing physical and social infrastructure that adapt to the climate changes;
- Mitigating environmental resource degradation.

### **Tsunami and Bangladesh**

Tsunami is a dual natural disaster. Tsunamis are a series of very long waves generated by any rapid, large scale disturbance of the sea. Most Tsunamis are generated by sea floor displacements from large undersea earthquakes. Tsunamis can cause great destruction and loss of life within a minute on shores near their source, and some Tsunamis can cause destruction

within hours an entire ocean basin. A magnitude 9.4 Mw earthquake occurred off the west coast of Sumatra, Indonesia, on December 26, 2004. It was the fourth largest earthquake in the world since 1900 and the largest since the 1964 Prince William Sound, Alaska, earthquake. The earthquake generated a tsunami that caused more casualties than any other in recorded history. The tsunami was recorded nearly world wide on tide gauges in the Indian, Pacific and Atlantic Oceans. In total more than 2,83,100 people were killed, 1,41,000 are still listed as missing and 11,26,900 were displaced by the earthquake and subsequent tsunami in 10 countries (including Bangladesh) in South Asia and East Africa.

It is very hard to escape violent disaster caused by Tsunami. But it is very important to create public awareness, improved tsunami detection, mitigation and warning system for huge loss of life and property. To protect Tsunami concern experts have suggested to take the following steps:

- ▶ Preservation of coral reef and natural mangrove forest;
- ▶ Afforestation in coastal area;
- ▶ To keep pollution free sea;
- ▶ Stop excess fishing in sea and introduce modern sustainable fish catching method;
- ▶ Public dwelling should be kept away minimum 500 meters from sea shore, coastal embankment;
- ▶ To take mass poverty reduction programme in coastal area, and
- ▶ To preserve biodiversity and also near-shore marine ecosystem through sustainable management.

After the Tsunami, a group of experts from International Oceanographic Center (IOC)/UNESCO came to Bangladesh. The group attended a workshop held on 22-24 August, 2005 in the Disaster Management Bureau with participants from different ministries/ divisions. In this workshop a draft work plan for Tsunami early warning system has been formulated.

#### **Activities of NGOs to Protect Environment**

Along with government, a good number of NGOs has been working to face environmental problems and to improve environmental system of the country since 1980s. Particularly, they 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 to protect environment of the country along with formulation of laws and the implementation of the conventions, protocols and agreements signed on environmental protection at international and regional level. People from all walks of life need to be involved to



protect environment and ensure development utilising all kinds of national resources. 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:*** Recognising 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 offences 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 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 the 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 of its establishment, the main task of Forest Department was to protect the forest and sustained yield management. The Sundarban Mangrove forest of Bangladesh is the largest compact mangrove forest (out of 10,000 sq.km. Bangladesh alone contains 6017 sq.km.). 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 & 1925 respectively.

Some development activities of forest department in the year of 2005-2006 were as follows:

- 1) In the social forestry programme as per benefit sharing agreement forest department distributed large amount of money among the participants.

- 2) "Tree Farming Fund" has been created to make the social forestry programme sustainable.
- 3) To give the legal support Social Forestry rules-2004 has been formulated.
- 4) To protect the bio-diversity, several projects have been taken. Included among them are :
  - (a) Modhupur National Park Development Project, at Tangail, (b) Kaptai National Park Development Project, (c) Dulahajra Safari Park, at Cox's Bazar, (d) Natural Environment and Bio-Diversity Conservation Project at Baskhali in Chittagong, (e) Integrated Reed-Land Social Forestry Project in Sunamjang district, (f) Establishment of Kuakata Eco-Park in Patuakhali district, (g) Bio-Diversity Conservation & Natural Environment development Project at greater Jessore district, (h) Establishment of Modhutilla Eco-Park at Sherpur district, (i) Sundarban Protected Forest Management Support Project.

### **Social Forestry & Forestry Sector Project (FSP)**

Social forestry activities of the forest department is one of the important and successful programmes. Since 1981, the department has implemented three social projects with financial assistance of Asian Development Bank (ADB). There is now another project' under implementation with financial assistance of ADB named 'Forestry Sector Project (1997-98 to 2005-06) at a total cost of Tk. 41528.91 lakh. The project is playing an important role to institutionalised the social forestry activities. This project is not only creating tree wealth and improving environmental situation, but also reducing poverty. Compared to 12.5 percent women participant in the 'Coastal Green Belt' project, women participants in Forestry Sector Project is 23 percent.

As of now through different social forestry projects 63898.00 ha. encroached and degraded forest area has already been bought under social forestry. Moreover, under social forestry programme 49413.00 km. strip plantation has been done and more than 4 lakh poor people have become the active participants of this programme.

Social forestry is not only producing wood, fuel-wood, and improving environmental condition, it is also playing a significant role in reducing poverty. From the ongoing forestry sector projects starting from 1999-2000, 19051.00 ha. forest from forest land and 8847.00 lakh forest from strip plantation have extracted whose selling price is Tk. 237,02,08,755.00. Out of this selling price an amount of Tk. 104,41,48710.00 has been distributed among 68375 participants, that helps them to a great extent to reduce their poverty.

The poverty reduction programme of social forestry have the similarity of the government PRSP. Needless to mention that, the forestry sector project is one of the most important projects of the government to reduce poverty by giving cash benefit to the poor participants.

### **Nishorga Support Project (NSP):**

Bangladesh Forest Department at the beginning of the new century has initiated a new project entitled Nishorga Support Project with financial assistance of USAID. The objective of this 5-year project (from 2004-05 to 2008-09) at a total cost of Tk. 6209.47 lakh 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. So the Forest Department aims 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 and the department work together for protection of natural forests and nature. The government and local people will share the income (if any). At initial stage, this co-management system" is being implemented at five natural forest areas namely Lawachara of Moulvibazar, Rema-Kalenga and Satchari of Hobigonj, Chunati of Chittagong and Teaknaf of Cox's bazar on experimental basis. This system will be extended gradually in later stage to other natural forest areas.

### **Bangladesh National Herbarium (BNH)**

Bangladesh National Herbarium is a national research organisation. One of the main aims of national herbarium is at 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 1500 plant specimens have been collected through botanical survey from the forest areas of the districts of Rangamati, Bandarban, Moulvibazar (Sremongal), Mymensingh, Tangail and Bogra since June 2004.
- **Plant Identification:** Through taxonomic studies about 500 plant species have been identified by National Herbarium since June 2004. Besides, as many as 300 plant species on request from various government and non-government organisations have been identified.
- **Taxonomic Studies and the Publication of the Flora of Bangladesh:** Under the Taxonomic studies carried out by the National Herbarium, manuscripts of seven Angiospermaic families have been compiled for the publication of the series 'Flora of Bangladesh', which would be published serially from the year 2005-06.
- **Publication of Flora of the Sundarbans:** Initiatives have been undertaken for the publication of the flora of the Sundarbans.
- **Handbook on Flora of Bangladesh:** Initiatives have been undertaken for the publication of a handbook on the flora of Bangladesh containing brief descriptions of the plant species.

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.

### **Bangladesh Forest Research Institute (BFRI):**

BFRI is only national forest research organisation. The main objectives of BFRI are to augment and preserve forest resources, reduce poverty create employment opportunities and develop new technology and scientific use of forest resources.

Through various seedlings nursery and establish of new garden system in coastal region by BFRI, which has positive impact in creation of mangrove forest of coastal region.

Forest Department has also introduced the new technologies of raising nursery. Besides, forest research at national level under the leadership of BFRI for development of bamboo, rattan and product creation a regional research activity along with Nepal, China of Myanmar has been started.

Some recent technologies developed by BFRI are mentioned below:

- ▶ Collection and Production guideline for improved quality of seeds;
- ▶ Clonal propagation technique for hybrid ecastia and syzygium grande;
- ▶ Tissue culture technique for bamboo and hybrid ecastia;
- ▶ To identify profitable rotation of important tree species;
- ▶ Enhancement of service life of rural housing materials (bamboo, wood, reed) through preservation technique;
- ▶ Utilisation of rubber wood for making and other usage;
- ▶ Technique for cheap wood preservation by using local raw materials.

#### **Bangladesh Forest Industries Development Corporation (BFIDC)**

The main objectives BFIDC are extraction of forest produces (timber) from the forests of the country, establishments of timber based industries, rubber plantation, productions, processing and marketing, best utilisation 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 fifteen rubber gardens that have been running with profit from last two financial years.

In FY 2003-04, the profit amounted to Tk. 265.54 lakh, in FY 2004-05 Tk. 1337.94 lakh, and Tk. 3038.00 lakh in FY 2005-06.

Moreover BFIDC meets about by 64 percent -70 percent of total demand of raw rubber of the country and thus saves foreign currency. This sector also directly and indirectly creates employment opportunities.

#### **Annual Development Programme:**

The Government of Bangladesh has been laying special emphasis on protection and development of environment. During FY 2005-06, the Ministry of Forest and Environment is implementing 29 projects with an RADP allocation of Tk 158 crore 72 lakh. Besides, 6 programmes are under implementation at a cost of Tk. 8 crore 49 lakh from revenue budget. Apart from these projects or programmes which are directly related to the development of environment and eco-system, other projects which have been taken up by different ministries such as Ministry of Water Resources, Ministry of Food and Disaster Management, Ministry of Fisheries and Livestock etc. are also involved in environmental development.