

Environment, Forestry and Biodiversity Conservation

Background Paper for Seventh Five Year Plan

LIST OF ABBREVIATIONS

3R	: Reduce, Recycle and Reuse
ADB	: Asian Development Bank
AQMP	: Air Quality Management Project
BCCSAP	: Bangladesh Climate Change Strategy and Action Plan
BDT	: Bangladesh Taka
BECA	: Bangladesh Environmental Court Act
BEISP	: Bangladesh Environmental Institutional Strengthening Project
BEMP	: Bangladesh Environment Management Programme
BIWTA	: Bangladesh Inland Water Transport Authority
BNH	: Bangladesh National Herbarium
CAMS	: Core Automated Maintenance System
CBD	: Conservation of Biological Diversity
CBO	: Community Based Organization
CCF	: Chief Conservator of Forests
CF	: Conservator of Forests
CHT	: Chittagong Hill Tracts
CSOs	: Civil Society Organization
CWBMP	: Conservation of Wetland and Biodiversity Management Project
DCC	: Dhaka City Corporation
DDT	: Dichlorodiphenyltrichloroethane
DOE	: Department of Environment
DPP	: Development Project Proposal
EA	: Environmental Assessment
ECAs	: Ecologically Critical Areas
ECA	: Environment Conservation Act
ECR	: Environment Conservation Rules
EIA	: Environmental Impact Assessment
ETP	: Effluent Treatment Plant
FD	: Forest Department
FYP	: Five Year Plan
GDP	: Gross Domestic Product
GEF	: Global Environment Facility
GO	: Government Organization
GoB	: Government of Bangladesh
HCFC	: Hydro chlorofluorocarbon
IAP	: Indoor Air Pollution
ICT	: information communication technology
ICTPs	: International Convention, Treaties and Protocols

IUCN	: International Union for Conservation of Nature
MDG	: Millennium Development Goal
MEAs	: Multilateral Environmental Agreement
MOEF	: Ministry of Environment and Forests
NAMA	: Nationally Appropriate Mitigation Action
NAPA	: National Adaptation Programme of Action
NBSAP	: National Biodiversity Strategy and Action Plan
NCS	: National Conservation Strategy
NEC	: National Environmental Committee
NEMAP	: National Environment Management Action Plan
NGO	: Nongovernment Organization
NSAPR	: National Strategy for Accelerated Poverty Reduction
NWMP	: National Water Management Plan
PA	: Protected areas
PCB	: Polychlorinated Biphenyls
POPs	: Persistent Organic Compounds
PPP	: Polluters Pay Principle
RAJUK	: Rajdhani Unnoyon Kortipokkho
REDD	: Reducing Emissions from Deforestation and Forest Degradation
RF	: Reserve Forest
RTI	: Right to Information
SD	: Sustainable Development
SEMP	: Sustainable Environment Management Programme
SFYP	: Sixth Five Year Plan
SRF	: Sundarbans Reserve Forests
UN	: United Nations
UNDP	: United Nations Development Programme
UNEP	: United Nations Environment Programme
UNESCO	: United Nations Educational, Scientific and Cultural Organization
UNFCCC	: United Nations Framework Convention on Climate Change
USAID	: United States Agency for International Development
WCED	: World Commission on Environment and Development
WSSD	: World Summit on Sustainable Development
WWF	: World Wide Fund for Nature

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1. INTRODUCTION

Poverty, growth and environmental sustainability are inextricably bound together in Bangladesh. Half the population depends on an over-exploited and degrading natural resource base. Industrial and urban growths are contributing economic livelihoods but already are serious threats to environmental and human health because of inadequate attention to environment and sustainable development. Studies have revealed that annually about 4% of GDP is lost and 22% of diseases are due to environmental degradation of which water quality is a predominant factor. It is fact that 66% of country's precious wetlands have been seriously degraded, natural forest cover has shrunk, leaving it far behind the MDG target and ecosystem productivity has seriously decreased because of human alterations and pollution. Appropriate policy and follow-up regulations with broad based stakeholder engagement, could assist in reducing dirty industries and pollution at the source. Unwise use of agro-ecosystems, wetlands and water resources in general and salinity intrusion in particular is posing a serious threat towards country's agricultural productivity as well as its food security. Degraded lands, wetlands, forest areas and other common pool resources have put extra pressure on the situation of poverty, retarding the poverty reduction measure. Poorly planned development interventions as well as economic activities are making cities and towns unliveable and limiting the carrying capacities of ecosystems and hinterlands.

In the last decade Bangladesh has made significant progress in terms of reducing population growth to 1.7% per annum, increasing economic growth to more than 6% per annum or more, and significantly reduced the number of people living in extreme poverty. Despite this, Bangladesh faces huge challenges which pose serious questions for the environment and sustainability of these trends. With the present growth rate, the population could be double by 2050, reaching some 270 million. It is predicted that most of the additional people will live in the rapidly growing urban areas. Population density is already the highest for a non-city state and is likely to average over 1,800 people per km² by 2050. At present about 26.7% of people live below the poverty line, and the natural resources on which the poor disproportionately depend are increasingly stressed. There are also critical external environmental trends that have to be taken into account for a sustainable Bangladesh. Climate change is predicted to raise average sea levels by around 30 cm by 2050, and could make an additional 14% of the country extremely vulnerable to floods by 2030, further squeezing population and resource use patterns. Being the lower riparian country not only makes Bangladesh highly prone to floods, but also dependent on trends in the 93% of the catchments that lie upstream and outside Bangladesh. Comparable trends in population density, population growth, industrialization, and lack of forest occur in the catchments, and can be expected to result in less water, of poorer quality reaching Bangladesh in the dry season.

In a country like Bangladesh where competition for resources is intense and the carrying capacity of the natural resource base has reached its limits with the rising urbanization and

industrialization, the issue of proper management of environment towards achieving sustainable development has immense potential to create not only sustainable growth but also release the social tension leading to public wellbeing. In this context, initiatives aimed at greening the economy in different parts of the world have shown to improve growth of GDP, especially for the poor, whilst the quality and quantity of jobs, stocks and flows of natural capital have also increased. UNEP research suggests that an investment scenario of allocating 2 per cent of global GDP to greening economic sectors can produce a higher global GDP, compared to business-as-usual scenario – within only 10 years. A package of green investments coupled with policy reforms aimed at making growth socially inclusive offers economically viable options to reduce poverty and hunger, and address challenges of environment, climate change and degradation of natural resources, while simultaneously providing new and sustainable pathways to economic development and prosperity.

It is experiencing a downtrend in environmental quality. The root challenges of environmental sustainability emanates at least from 3 sources: huge population pressure, poverty & economic growth. In many respects, the situation has reached a crisis proportion especially in the capital city Dhaka and its surrounding rivers.

Objective of the study

The objective of the study is to explore environmental sustainability activities, review past policies, strategies & plans, assess Bangladesh's stance with regard to MEAs, review the priorities outlined in the 6FYP, analyze progress towards the targeted benchmarks, review achievement/failures of national sustainable development strategies, governance issues etc with a view to ensure inclusive and equitable economic growth and environment, forestry and biodiversity conservation.

Methodology and Approach

The present document is based on desk review of environment and forestry laws, policies, plans and programs and where necessary expert consultation were made. DoE and FD officials were consulted in particular on their project needs and the estimated costs.

Entire review process was completed through a 3 step process. These are:

- a) Critical desk level analysis of the policies, laws, plans and the institutional framework.
- b) Studying environmental sustainability issues, MEAs and their implications, reviewing the performance during 6th FYP.
- c) Crosschecking the review results by discussion with experts/ veterans in the sector through one to one interview and group discussion.

Limitation of the study

The scope of the study does not cover climate change and its associated impacts on environment.

Presentation of the review findings

Chapter 1 introduces the objective of the study and the methodology and approach.

Chapter 2 provides the review analysis of policies, strategies and plans.

Chapter 3 provides the observation and assessment in relation to environmental sustainability.

Chapter 4 analyses implementation status of MEA's.

Chapter 5 discusses governance issues.

Chapter 6 provides an environmental sustainability review using Driver- Pressure- States- Response framework.

Chapter 7 provides review analyses of 6th FYP on environment management, devises targets, strategies and recommendations for 7th FYP.

Chapter 8 provides review analyses of 6th FYP on forestry management, devises targets, strategies and recommendations for 7th FYP.

Chapter 9 provides concluding remarks.

2. REVIEW OF KEY POLICIES AND PLANS

2.1 Key policies & Acts

Bangladesh Constitution

Bangladesh constitution is the supreme law of the country. Article 18A of the constitution ensures environment protection and the pursuit of sustainable development.

Environment Policy 92

The national Environment Policy 1992 embraces a number of related different sectors including agriculture, industry, health, energy, water, land, forest, fisheries, marine, transport, housing, population, education and science. The central theme of the policy is to ensure the protection and improvement of the environment. It delivered required actions in the development sectors of the country to facilitate long term sustainable use of all natural resources.

It also gave the direction of amending the existing laws, formulating the new laws and implementing the same. It also assigned the Ministry of Environment and Forests to coordinate the implementation of the policy and to constitute a high level National Environmental Committee (NEC) with the head of the government as the chairperson exercising the direction, supervision, and overseeing the implementation of the policy.

Environmental policy of Bangladesh addressed 15 broad sectors to deal with overall environmental issues. For each of the sectors some goals and target were set and action plan to achieve targets.

It is learnt from DoE that it has revised the Environment Policy'92 to make it updated and compatible with the current national and international situation.

Environmental Conservation Act 1995 (Revision up to 2012)

Environment Conservation Act 1995 (ECA 1995) is currently the main act governing environmental protection in Bangladesh, which replaced the earlier environment pollution control ordinance of 1992 and provides the legal basis for Environmental Conservation Rules, 1997 (ECR'97). The main objectives of ECA'95 are: conservation of the natural environment and improvement of environmental standards, and control and mitigation of environmental pollution. The main strategies of the act can be summarized as:

- Declaration of ecologically critical areas, and restriction on the operation and process, which can be continued or cannot be initiated in the ecologically critical areas.
- Regulation in respect of vehicles emitting smoke harmful for the environment.
- Environmental clearance.
- Remedial measures for injury to ecosystem
- Regulation of the projects and other development activities - discharge permit.
- Promulgation of standards for quality of air, water, noise and soil for different areas for different purposes.
- Promulgation of standard limit for discharging and emitting waste.
- Formulation and declaration of environmental guidelines.

The Act is implemented by Department of Environment (DOE), under the Ministry of Environment and Forest. Before going for any new development project, the project proponent must have to take Environmental Clearance from DOE. The procedures to take such clearance are in place. Failure to comply with any part of ECA'95 may result in punishment by a maximum of 10 years imprisonment or a maximum fine of Tk. 1000,000 or both.

Bangladesh Environmental Conservation Act (Amendment 2000) focuses on: (1) ascertaining responsibility for Compensation in cases of damage to ecosystems, (2) increased provision of punitive measures both for fines and imprisonment and (3) fixing authority on cognizance of offences.

Bangladesh Environmental Conservation Act (Amendment 2002) elaborates on: (1) restriction on polluting automobiles, (2) restriction on the sale and production of environmentally harmful items like polythene bags, (3) assistance from law enforcement agencies for environmental actions, (4) break up of punitive measures and (5) authority to try environmental cases.

Bangladesh Environmental Conservation Act (Amendment 2010) elaborates on (1) demarcation of wetlands and water bodies, (2) Hazardous waste import, transportation, storage etc., (3) Cutting of hills, mountains (4) Ecologically Critical Areas.

Environmental Conservation Rules 1997

Environmental Conservation Rules 1997 consists of a set of the relevant rules to implement the ECA' 95, which specify:

- Categorized list (green, orange and red) of the projects,
- Procedure to take environmental clearance,
- Ambient standards in relation to water pollution, air pollution and noise, as well as permitted discharge/emission levels of water and air pollutants and noise by projects Environmental Categories.

ECR 97 classifies projects by potential environmental impact and assigns different assessment and management requirements as follows:

Green List projects are those with positive environmental impacts or negligible negative impacts such as plantation and nursery. Clearance for these is obtained on the basis of project description, initial screening and No Objection Certificate (NOC) by the local authority.

Orange List projects fall into two categories. Orange A projects are those with minor and mostly temporary environmental impacts for which there are standard mitigation measures, such as the installation of tube wells, pond sand filter (PSF), tank/reservoir, sanitary latrines etc. Application for DOE's environmental clearance requires general information, a feasibility report, a process flow diagram and schematic diagrams of facilities, environmental screening form, NOC from local authority.

Orange B projects are those with moderately significant environmental impacts for which mitigation measures are easily identified, such as construction/re-construction of earthen roads, culverts, community center, office building for general services, re-excavation of canal, repairing embankment, and school field, etc. These require Environmental Clearance Certificate from DOE, for which an Initial Environmental Examination (IEE) report, Environmental Management Plan, along with the information and papers specified for Category A projects.

Red List projects are those which may cause ‘significant adverse’ environmental impacts such as the construction of bridge, industrial factories, flood shelter, embankment, water control structure, etc. They require IEE report to obtain the Site Clearance Certificate, and subsequently a full EIA report for ECC, along with the information required for other Categories. A good number of sectoral EIA guidelines have been prepared to assist the EIA process.

Environmental standards also promulgated under the Environment Conservation Rules 1997 are prescribed for varying water sources, ambient air, noise, odor, industrial effluent and emission discharges, vehicular emission, etc. with the main aim of limiting the volume and concentrations of pollution discharged into the environment. A number of surrogate pollution parameters like Biochemical Oxygen Demand, or Chemical Oxygen Demand; Total Suspended Solids, etc. are specified in terms of concentration and/or total allowable quality discharged in case of waste water and solid waste. Additionally specific parameters are specified such as phenol, cyanide, copper, zinc, chromium, and various types of particulate, sulfur dioxide, nitrogen oxides, volatile organic compounds and other substances

The Environment Court Act, 2000

The Environment Court Act, 2000 has been enacted in order to establish environmental courts in each administrative division of Bangladesh. Under this Act, the court has concurrent jurisdiction i.e. to try both civil and criminal cases. The basis for instituting a case is a violation of the “environmental law”, meaning the Bangladesh Environment Conservation Act, 1995 (ECA) and Rules made there under. In particular the environment court is empowered to:

- Impose penalties for violating court orders;
- Confiscate any article, equipment and transport used for the commission of the offence;
- Pass any order or decree for compensation;
- Issue directions to the offender or any person (a) not to repeat or continue the offence; (b) to take preventive or remedial measures with relation to any injury, specifying the time limit and reporting to the DOE regarding the implementation of the directions.

Under this Act the Director General of the DOE has the power to impose heavy penalties to polluters who are dumping untreated wastewater into the environment or not operating their legally mandated ETPs.

Parliament also passed bills in 2010 for increasing the number of environment courts and their authority to take stern actions against polluters, making provision for establishing a trust to tackle adverse impacts of climate change. A new bill was also placed in parliament seeking to enact a law to punish illegal sand extraction and to lease sand quarries in an environmentally friendly way.

The new legislation, which was passed repealing the existing Environment Court Act, 2000, aims to expedite trial of environment related offences and offers setting up environment court at every district headquarters with expanded jurisdiction to take stern actions against all sorts of polluters.

The Environment Court Act, 2000 allowed the government to form court only at divisional headquarters. According to that law, a person might be jailed for maximum three years or fined Tk 3 lakh for polluting environment. But the new legislation increased the jail term up to five years and the fine up to Tk 5 lakh. Both the special magistrate's court and the environment court will enjoy authority to realize fines from the offenders. Besides, the courts may order to meet

expenses for conducting cases and give the money in compensation to the affected individuals or organizations.

2.2 Key strategies & plans

National Conservation Strategy (NCS)

National Conservation Strategy was drafted in late 1991 and submitted to the Government in early 1992. This was approved in principle; however the final approval of the document is yet to make by the cabinet.

For sustainable development in the energy sector, the strategy document offered various recommendations but none was there concerning the present specific project execution program or related matter.

Major relevant recommendations are:

- To use minimum possible area of land in exploration sites;
- Rehabilitate site when abandoned;
- To take precautionary measures against Environmental Pollution from liquid effluent, condensate recovery and dehydration plants; and
- Technology assessment for selection of appropriate technology.

National Environment Management Action Plan (NEMAP)

The National Environmental Management Action Plan (NEMAP) is a wide ranging and multifaceted plan, which builds on and extends the statements set out in the National Environmental Policy, NEMAP was developed to address issues and management requirements for a period between 1995 to 2005 and set out the framework within which the recommendations of the National Conservation Strategy are to be implemented.

NEMAP has the broad objectives of:

- Identification of key environmental issues affecting Bangladesh.
- Identification of actions necessary to halt or reduce the rate of environmental degradation.
- Improvement of the natural and built environment.
- Conservation of habitats and bio-diversity.
- Promotion of sustainable development; and
- Improvement in the quality of life of the people.

Sustainable Environment Management Plan (SEMP)

A segment of NEMAP, centered on green initiatives, was launched in 1998 by MoEF through the implementation of a US \$ 26 million ‘umbrella’ programme called the “Sustainable

Environment Management Programme (SEMP)” which lasted until 2006. The SEMP was unique in the sense that it was the largest single initiative under the environment sector, the first initiative launched under “programme approach”, aimed at a larger national objective in the area of environment with the participation of a host of government departments, agencies and ministries, NGOs, CSOs and international bodies like IUCN. They implemented 26 individual projects addressing various aspects of NEMAP under 5 thematic areas as follow:

- Environmental Policy & Legislation
- Participatory Eco-system Management
- Community Based Environmental Sanitation
- Advocacy & Awareness Campaigns
- Training & Education

SEMP additionally developed an environment plan for the Chittagong Hill Tracts (CHT) called NEMAP-CHT and, as a follow-up to it, developed a medicinal plants in Khagracharri and malaria eradication model for Rangamati. The SEMP interventions in CHT also opened the door for more support for the CHT region through a donor consortium. Another segment of NEMAP, launched by MoEF was the US\$10 million Bangladesh Environment Management Project (BEMP) which dealt with capacity building of the government for sustainable environmental management. Brown issues like improving the air quality was addressed through the Air Quality Management Project (AQMP).

On completion of AQMP the government with the assistance of Canadian government (CIDA) launched Bangladesh Environment Institutional Strengthening Project (BEISP). The objective of this project was to strengthen the capacity of DOE by establishing database and transparency in the review process of EIA and clearance certificate (ECC), establishing library & documentation centres, imparting training on industrial pollution control, prosecution, environmental monitoring among others. A Strategic Plan was also prepared. It provides guidance on DOE’s direction for the five-year period. The plan proposed to adhere to six areas of concentration:

- Enhancement of environmental compliance
- Mitigation of potential environmental impacts through the environmental assessment and clearance process
- Spreading of efforts to address critical urban air quality and water quality problems
- Facilitation of meaningful stakeholder participation in environmental management
- Natural resources conservation through identification of ecologically critical areas and
- Ensuring effective, efficient and accountable DoE’s service.

The main elements of the Strategic Plan are

- Development of a comprehensive enforcement and compliance policy and related strategies
- Development of improved EIA procedure and guidelines
- Standards and guidelines related to EC, inspection and legal enforcement
- Development of associated enforcement and compliance information system
- Bolstering the environmental monitoring capacity of DOE
- Innovative approaches to promote compliance
- Ensuring Bangladesh commitments to international instruments
- Enhancing DOE’s role in designation and management of ECA

- Improving coordination and reporting function of DOE
- Improving DOE's outreach activities.

Under each element the tasks, status and steps to be taken during 2010-14 were defined in the plan. The status of the defined tasks in the strategic plan need mid-term assessment for follow up actions required for the implementation of the tasks during plan period.

National Biodiversity Strategy and Action Plan for Bangladesh (NBSAP)

The NBSAP provides a framework for conservation, sustainable use and sharing the benefits of biodiversity of the country. A major focus of the plan is to ensure cross-sectoral linkages, reflecting the fact that in Bangladesh, more so than most other countries, biodiversity conservation is closely inter-woven with social and economic development. Thus, the NBSAP also provides a framework for securing the necessary environmental settings to reduce poverty, ensure sustainable development and implementation of Poverty Reduction Strategy Paper (PRSP). Sixteen strategies have been developed to shape and direct the actions towards achieving the goals and objectives of the NBSAP.

The Ministry of Environment and Forests is to coordinate the implementation of the NBSAP. All relevant Ministries/ Divisions, government agencies, institutions, academic institutions, non-governmental organisations and communities would be responsible for activities that fall within their mandate. An 'Apex Body' was proposed to coordinate the implementation of the NBSAP. A financing strategy was proposed for re-sourcing the implementation of the NBSAP. This focused on increasing of public budget allocations, use of domestic instruments like taxes on water, timber, levies from road, rail and air passenger tariffs, debt swap trust funds and development partners' contribution. A communication strategy was also incorporated in the plan for effective awareness raising and information dissemination.

Draft Roadmap for National Adaptation Plan (NAP)

Bangladesh has already drafted a Roadmap for NAP towards formulating a comprehensive NAP with a view to reducing vulnerability to the impacts of climate change, by building adaptive capacity and resilience. The NAP will also facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

Perspective Plan 2010-2021

The Perspective Plan of Bangladesh 2010-2021 has provided the road map for materialization of the national goals enshrined in The Vision 2021. That Vision embodies a dream that Bangladesh, on the eve of its 50th anniversary of independence, will cross into the middle income country threshold, its citizens will enjoy a higher standard of living, will have better access to education, will benefit from improved social justice, and will live in a more equitable socio-economic environment. These milestones will be achieved in a political climate that is in line with core

democratic principles of human rights, freedom of expression, the rule of law, equality of citizens irrespective of race, religion and creed, and equality in opportunities.

Development priorities of the Perspective Plan are distilled from the vision statement formulated to take Bangladesh to where it ought to be in the year 2021, given its human potential and natural resource endowments. Those development priorities include ensuring broad-based growth and reducing poverty; ensuring effective governance and sound institutions but creating a caring society; addressing globalization and regional cooperation; providing energy security for development and welfare; building a sound infrastructure and managing the urban challenge; mitigating the impacts of climate change; and promoting innovation in a knowledge-based society.

The goal of the perspective plan is to implement strategies to protect environment from further degradation and protect the country from unpleasant effects of climate change and global warming. The plan targets to take all necessary actions to protect the vulnerable people from natural calamities, to take actions for the prevention of industry and transport related air pollution and to ensure disposal of waste in a scientific manner. Required steps will also be taken to make Bangladesh an ecologically attractive place and to promote environment-friendly tourism.

NSDS

The NSDS (2010-21) has identified five Strategic Priority Areas along with three cross-cutting areas with a view to achieving its stated vision and addressing long-term sustainability issue of productive resources. The strategic priority areas include sustained economic growth, development of priority sectors, social security and protection, environment, natural resources and disaster management. The three cross-cutting issues that will support the sustainable development of priority areas include disaster risk reduction and climate, good governance and gender. The Sustainable Development Monitoring Council will be the apex body to monitor and evaluate the progress of implementation of NSDS.

This NSDS has been formulated to guide the country to face the challenge for sustainable economic growth with environmental safety and ensuring social justice. The time frame of NSDS coincides with the Perspective Plan of Bangladesh 2010-2021 which guides the economy towards its transition to a middle income economy by early next decade of this millennium. The Planning Commission will need to take necessary measures to mainstream the strategies of NSDS into national development planning processes.

- **Achievements**

Bangladesh's government has established a Sustainable Development Monitoring Council and its supporting institutional structure. The council is headed by Finance Minister and involving the representatives from concerned ministry/department/agencies, training institute and research organizations, NGOs and civil society, academic and

expert, professionals and specialists and private sectors. Moreover, the Government Bangladesh is establishing a Sustainable Development Board with the proposed members coming from representatives of related ministries and government agencies. Bangladesh made progress towards environmental sustainability by integrating the principles of sustainable development into country policies and programs to reverse the loss of environmental resources, sustainable access to safe drinking water and basic sanitation, improvement in the lives of at the slum dwellers. Bangladesh has made commendable progress in respect of eradication of poverty and hunger. It has sustained a GDP growth rate of 6 percent or above in recent years that has played a positive role in eradicating poverty.

- **Failures**

At present there is only 13.20 percent of land in Bangladesh having tree cover with density of 30 percent and above and the area having tree cover is much lower than the target set for 2015.

- **Way forward**

NSDS needs to be meticulously implemented and monitored to ensure sustainable development. It should integrate the deliverables of all the programme activities to enhance knowledge-base and develop better understanding in harmonizing activities. It should also be comprehensive in what needs to be done by what, when, where, how the budget, resources for the sustainable development.

Overall, the link between population growth and the resulting increased demand for water, sanitation, energy, food and housing will have significant impact upon the environment. It is also important the land access issues forcing people to occupy and farm. The drive toward middle-income status has raised both living standards and expectations. All of these complex issues result in a dynamic and constantly evolving development scenario which needs due consideration as Bangladesh's post- 2015 development.

2.3 Other sectoral policies

National Forest Policy (1994)

The National Forest Policy of 1994 is the amended and revised version of the National Forest Policy of 1977 in the light of the National Forestry Master Plan. The major target of the policy is to conserve the existing forest areas and bring about 20% of the country's land area under the Forestation Program and increase the reserve forest land by 10% by the year 2015, through coordinated efforts of GO-NGOs and active participation of the people.

The priority protection areas are the habitats which encompass representative flora and fauna in the core area of national parks, wildlife sanctuaries, and game reserves. Multiple-use of forest,

water and fish of the Sundarbans through sustained management will be ensured, keeping the bio-environment of the area intact.

Wetland Policy, 1998

The Policy is relevant to the Project because it seeks to conserve wetlands to sustain their ecological and socio-economic functions and further sustainable development; establish key principles for wetland sustainability and unsustainable practices; maintain existing levels of biodiversity; maintain wetland functions and values; and actively promote integration of wetland functions in resources management and economic development decision taking.

National Fisheries Policy

The National Fisheries Policy provides the framework for the conservation and management of fisheries resources to ensure supply and enhance production. All the water bodies suitable for fisheries production and their fisheries resources conservation, development and management are addressed under this policy. These include rivers and canals, haor and baor, floodplains, open and coastal water systems.

Tourism Policy

The National Tourism Policy of Bangladesh was declared in 1992. Its main objectives are:

- To create interest in tourism among the people
- To preserve, protect, develop and maintain tourism resources
- To take steps for poverty-alleviation through creating employment
- To build a positive image of the country abroad
- To open up a recognized sector for private capital investment
- To arrange entertainment and recreation
- To strengthen national solidarity and integrity

In line with the policy, the Bangladeshi Government provides incentives to attract private sector partners. The incentives include tax-holiday, loans, concession rates for taxes and duties and in specific cases, allotment of land etc.

Land Use Policy

The National Land Use Policy 2001 of the Ministry of Land highlights the need, the importance and modalities of land zoning for integrated planning and management of land resources of the country. Many other policies, strategies, plans of the government have also recommended for land zoning since long. The National Land use Policy 2001 also mentioned the need of formulating a Zoning Law and Village Improvement Act for materializing the identified land zoning area.

In the Sixth FY Plan and Strategic Priorities of Digital Bangladesh there is a priority goal mentioning 'Planned use of land according to Land Zoning Maps prepared on the basis of present and potential land use will be ensured through enforcement of the provisions of relevant

laws'. For this reason, the present government has given priority on National Land Zoning Project.

The National Land Zoning Project is in line with the long-term political vision of present government towards building a 'Digital Bangladesh'.

National Water Policy (2012)

The National Water Policy of 1999 was passed to ensure efficient and equitable management of water resources, proper harnessing and development of surface and ground water, availability of water to all concerned, and institutional capacity building for water resource management. It has also addressed issues like river basin management, water rights and allocation, public and private investment, water supply and sanitation and water needs for agriculture, industry, fisheries, wildlife, navigation, recreation, environment, preservation of wetlands, etc. The water policy, however, fails to address issues like consequences of trans-boundary water disputes and watershed management.

It provides the framework for the management of water resources of the country in a comprehensive, integrated and equitable manner. The NWP recognizes that water is essential for human survival, socio-economic development of the country, and preservation of its natural environment. It is vital that the continued development and management of the nation's water resources should include the protection, restoration, and preservation of the environment and its bio-diversity.

Coastal Zone Policy

The Coastal Zone Policy (CZP) 2005 aims to ensure that a participatory and integrated approach is taken in the management and development of the coastal zone, to reduce conflicts in the utilization of coastal resources and to optimize exploitation of opportunities. This is in view of the complexity of the coastal zone, which encompasses both the terrestrial and aquatic environment and transcends a wide variety of human activities.

Industrial Policy (2010)

The Industrial Policy, 2010 presents an integrated strategy for achieving high economic growth in the country through rapid industrialization. It has been prepared taking into consideration the government's determination to achieve the Millennium Development Goals (MDGs) by 2015, and halve the number of the unemployed and hunger- and poverty-stricken people by 2017.

The Industrial Policy, 2010 aims to ensure a high rate of investment by the public and private sectors, a strong productive sector, direct foreign investment, development of labour intensive industries, introduction of new appropriate technology, women's participation, development of small and cottage industries, entrepreneurship development, high growth of export, infrastructure development, and environmentally sound industrial development.

National Energy Policy 1995

One of the seven 'objectives' (section 1.2) addresses the environment and says "to ensure environmentally sound sustainable energy development programs causing minimum damage to environment". Policy issues (section 7.1) include both 'energy conservation' and 'environmental consideration issues'. Section 7.1.8 'energy conservation' requires "an end-use based energy

planning process method to be undertaken to incorporate energy conservation measures in energy planning process". Section 7.1.9 (environmental consideration) says that "Environmental issues will be conserved for all type of fuels and in each and every step of fuel cycle; namely, exploration, appraisal, extraction, conversion, transportation and consumption. It may be reiterated that at present per capita emission of carbon dioxide is very low. It is envisaged that in foreseeable future, emission of carbon dioxide gas would not exceed the existing average emission of low income developing countries'. While considering the legal issues, the energy policy recommends (section 7.1.19 legal Issues) "Environmental issues to be considered under National Energy Policy are to be mandated under National Environment Policy and Environment Act".

- As specific policy recommendation under chapter 1.9, 'Environment Policy,' the Energy Policy has seven recommendations. Four of these are relevant here:
- Environmental impact assessment should be made mandatory and should constitute an integral part of any new energy development project.
- Use of economically viable environment friendly technology is to be promoted.
- Use of fuel wood is to be discouraged and replacement fuels are to be made available at an affordable price.
- Popular awareness to be promoted regarding environmental conservation.

National Agricultural Policy, 1999

The overall objective of the National Agriculture Policy is to make the nation self-sufficient in food through increasing production of all crops including cereals and ensure a dependable food security system for all. One of the specific objectives of National Agricultural Policy is to take necessary steps to ensure environmental protection as well as „environment-friendly sustainable agriculture. Through increased use of organic manure and strengthening of the integrated pest management program. The policy also suggests creating awareness so that the chemical fertilizers and pesticides used for increased crop production do not turn out to be responsible for environmental pollution. Water logging and salinity are identified as one of the serious problem in some parts of the country including the coastal areas for agricultural activities and environmental damage. The policy recommends for crop rotation and salt tolerant crop varieties.

2.4 Key strength of the policies/ programmes/ projects

- Article 18 A of the constitution ensures environment protection and the pursuit of sustainable development is therefore a constitutional obligation.
- The concern about environmental issues also has been reflected in different policy initiatives taken by the government of Bangladesh. The major policy initiatives, strategies and plans emphasized environment and natural resources management to achieve sustainable development.
- Acknowledgement of the integrate linkage of poverty, population pressure, illiteracy, inadequate health care facility and environmental awareness in environmental

management and acknowledgement of the need to address these situations in an integrated manner.

- The Environment Policy attempts to address environment degradation and pollution by providing guidelines to the sectors which are responsible for this degradation and pollution.
- MoEF has an wealth of experiences on GO/NGO collaboration in the planning, designing and implementing environment management projects. MOEF sought to involve the civil society, CBOs & NGOs. A major work was undertaken with active participation of these actors, which in turn generated public opinion through an elaborate consultation process at the grass roots, has been the formulation of NEMAP in 2005.
- Under ECA'95, EIA has been accepted as a mandatory tool to identify and predict impacts and undertake proper mitigation measures in a project scale. To ensure that people likely to be affected takes part in making development decision. EIAs of projects & industries are made public & scrutinized.
- DoE routinely does the public hearing. It does also make disclosure of EIA. This programme has increased its accountability.

3. OBSERVATION/ ASSESSMENTS RELATED TO ENVIRONMENTAL SUSTAINABILITY

From the review of policies, plans and programs presented above, it appears that Bangladesh is making its efforts to confront environment and climate change problems. However, these efforts are not proving adequate for the challenges, as it manifest in the state of environment, which is summarized below.

3.1 Pollution

Pollution issues are most acute in urban and industrial areas. Concentration of people in urban growth centers simultaneously increase the concentration of domestic and industrial activities that lead to pollution problems. The major pollutant concern for rural areas is the runoff of agrochemicals from agricultural fields, which deteriorates water quality, primarily impacting the fisheries sector.

Water pollution

Water pollution is mostly concentrated in urban growth centers and industrial belts. Pollutants from municipal, industrial and agricultural waste enter into the inland water systems due to lack of compliance, inadequate regulatory measures and no institutional systems for proper monitoring and control. Major causes of pollution that aggravate water quality are *industrial effluents, agrochemical, fecal pollution, spillage, and low water flow* in dry season.

Dhaka surface water with its surrounding rivers Buriganga, Balu, Turag & Sitalakhya which have been declared Ecologically Critical Areas (ECA)s are in very poor condition, especially in the dry season when dilution of contaminants is drastically reduced. For some months in dry season, dissolved oxygen (DO) become completely void in these rivers.

It appears that surface water quality clearly varies in a spatio-temporal context. The findings of the DoE monitoring study presented in Tables 1.1 and 1.2 provide a comparative picture.

Table-1.1: **Dry season (Nov-May) Water Quality of Selected Rivers for 2010**

Name of River	DO (mg/l)	BOD (mg/l)	COD (mg/l)	TOS (mg/l)	Chloride (mg/l)	pH
Buriganga	0.5	26	76	554	26	7.4
Shitalakhya	3.8	9	-	223	11	7.2
Balu	0	29	-	883	33	7.5
Turag	0	29	-	906	37	7.6

Rupsha	5	0.9	66	5250	3227	7.6
Mathavanga	3.6	70	1076	344	101	7.6
Halda	6.7	1	6	255	68	7.3
Karnafully	6.7	1.2	288	4533	1996	7.6

Source: Compilation of surface water quality monitoring results of DOE divisional labs.

Table-1.2: Wet Season (Jun-October) Water Quality of Selected Rivers for 2010

Name of River	DO (mg/l)	BOD (mg/l)	COD (mg/l)	TDS (mg/l)	Chloride (mg/l)	pH
Buriganga	4.5	5	28	198	11	7.2
Shitalakhya	5.8	4	-	117	8	7.0
Balu	5	6	-	324	8	7.2
Turag	5.1	8	-	302	9	7.4
Rupsha	5.2	0.8	39	1981	1211	7.7
Mathavanga	5.1	5	111	169	19	7.7
Halda	7	1	6	82	28	7.1
Karnafully	6.8	1	203	2141	1234	7.4

Source: Compilation of surface water quality monitoring results of DOE divisional labs.

Solid waste

Estimates for solid waste generated only in Dhaka city alone ranges from 3,500 to 4,000 tons per day. They come from households, commercial and industrial establishments and street sweepings. Households generate most of the solid waste, accounting for nearly 45% of the total. Only around 40% of the solid waste generated in Dhaka city is estimated to be collected by the municipal authorities. The indiscriminate disposal of solid waste in public places causes serious environmental hazards and health risks. Rotten and decomposed garbage make neighborhoods filthy, foul smelling and unhealthy. Uncontrolled and open dumping also clog the urban drainage system, cause frequent drainage congestion and threaten the contamination of water supply. The situation is similar for other municipalities.

Hospital waste

Inadequate waste management systems exist for the large variety of healthcare facilities across the country, which pose a serious threat to public health as well as to the environment. Most medical waste including syringes, needles, soiled swabs, bandages and blood contaminated items are frequently thrown in open dustbins. Strict rules and guidelines exist for medical waste separation, collection and disposal, but most of the public and private hospitals fail in their compliance. The disposal of such hazardous portion of wastes from hospitals into public waste disposal system exposes the people to serious health risks. Limited services operate in Dhaka, Chittagong and Khulna, for separate collection and disposal of hospital waste.

Air pollution

Air pollution is more acute in urban areas than in rural areas. In urban area, the main sources of air pollution are emissions of harmful gaseous matters from vehicle, brick making industries, industrial sectors, construction and open dumping of garbage.

A considerable portion of respiratory infections and disease in Bangladesh may be attributable to urban air pollution. While the problem is most severe in Dhaka, because air quality is worse and more people are exposed, air pollutions becoming a growing concern in other major cities as well. Measurements in Dhaka indicate that *particulate matter* is the most significant pollutant, and mobile sources remain the priority for emissions control.

Summary of the findings of PM10 & PM2.5 concentrations in Dhaka for 2013 are presented in Table 1.3 & Table 1.4 respectively.

Table 1.3: PM10 Concentration

CAMS ID	STATION	No of valid Value	Data Capture Rate	Average	Standard Deviation	Percentile 98	Minimum	Observation	% of observation
CAMS-1	Sangshad Bhaban, Dhaka.	174	47.67	148.82	103.09	403.47	34.37	65	37.36
CAMS-2	BARC, Farmgate, Dhaka	180	49.32	117.22	88.13	350.07	25.94	45	25
CAMS-3	Darus-Salam, Dhaka	337	92.33	160.12	115.36	451.94	22.47	149	44.21
CAMS-4	Gazipur	287	78.63	146.28	109.89	395.21	13.53	131	45.64
CAMS-5	Khanpur, Narayanganj	310	84.93	174.22	128.81	457.2	22.42	124	41.06

CAMS-6	TV station, Chittagong	258	70.68	88.44	73.18	293.31	2.63	47	18.22
CAMS-7	Agrabad, Chittagong	309	84.66	130.47	103.86	346.8	10.85	113	36.57
CAMS-8	Red crescent campus, Sylhet	270	73.97	115.81	72.9	269.45	17.99	90	33.33
CAMS-10	Shalbagan, Rajshahi	DNA	DNA	DN A	DNA	DNA	DN A	D N A	DNA
CAMS-11	Barisal	328	89.86	114.35	93.32	375.31	17.0	103	31.4

Table -1.4: PM2.5 Concentration

STATION ID	STATION	No of Valid Value	Data Capture Rate	Average	Devition Std	Percentile 98%	Maximum	Minimum	Observation of Exceeding of AQL Total	% of Observation of Exceeding of AQL
CAMS-1	Sangshad Bhaban, Dhaka.	189	51.78	81.13	76.31	271.41	315.6	10.01	76	40.21
CAMS-2	BARC, Farmgate, Dhaka	156	42.74	75.9	63.7	224.81	254.9	6.3	69	44.23
CAMS-3	Darus-Salam,, Dhaka	334	91.51	90.87	78.42	299.76	355.17	12.43	156	46.71
CAMS-4	GAZIPUR	286	78.36	90.18	71.29	261.64	325.53	6.04	144	50.35
CAMS-5	Khanpur, Narayanganj	219	60	83.12	94.67	334.2	360.57	6.86	74	33.79
CAMS-6	TV station, Chittagon	191	52.33	50.98	48.53	207.88	265.21	1.62		

STATION ID	STATION	No of Valid Value	Data Capture Rate	Average	Devition Std	98% Percentile	Maximum	Minimum	Observation of Exceeding of AQL Total	% of Observation of Exceeding of AQL
	g									
CAMS-7	Agrabad, chittagong	271	74.25	70.72	61.96	223.87	321.56	10.35	104	38.38
CAMS-8	Red crescent campus, Sylhet	276	75.62	63.93	50.47	190.16	240.69	7.35	112	40.58
CAMS-10	Shalbagan Rajshahi	67	18.36	91.61	35.25	147.59	187.9	18.05	49	73.13
CAMS-11	DFO office campus, Barisal	304	83.29	81.63	69.25	296.49	349.45	14.09	129	42.43

Environmental risk to health

While the total burden of disease in Bangladesh is comparable to other low income Asian countries, the share attributable to respiratory infections and diarrheal disease is significantly higher. Both are associated with poor environmental conditions, highlighting the relatively greater importance of focusing attention on environmental quality in Bangladesh.

Inhaling smoke from burning biomass can have both temporary and permanent consequences for health, and recognition of the health impacts of IAP is growing worldwide. Poor households in Bangladesh depend heavily on wood, dung and other traditional fuels for cooking. As a result, the health impacts of IAP are significant.

Environmental health risks due to arsenic contamination in ground water and health risks due to use and abuse of formalin, pesticides and other preservatives (chemicals) in foods, fruits, fishes also deserve attention.

3.2 Unplanned urbanization

For a developing country like Bangladesh, the conservation of the environment is of paramount importance, considering the fact that population and urbanization are recording concomitant rapid growth. People in large numbers are migrating from rural areas to the urban locations, consequently increasing the pressure on land, housing, education, sanitation and other infrastructural and social overheads. Manifold increase in the urban population in the Bangladesh has necessitated planned growth of cities with special regard to environmental considerations.

The Brundtland Report (WCED, 1987) expresses considerable concern regarding four major features of urban development in developing countries:

- The continuing growth of mega-cities with associated processes of urban decline, poverty, deprivation, and environmental deterioration
- Sectoral, macroeconomics, and pricing policies of government that have reinforced the concentration of population in major cities and distorted the terms of trade between urban and rural areas
- The lack of focus on the development of small towns and on strengthening the complementarity between rural and urban development
- The lack of decentralization and devolution to municipal governments of political, institutional, and financial powers that could strengthen the municipalities capacity to find and carry out effective solutions for local urban problems and stimulate local opportunities

Bangladesh is a classic example of all the above characteristics of unplanned urbanization. Rapidly growing urban areas in Bangladesh is facing:

- Very bad ambient air and water quality,
- Development of squatter settlements
- Substandard housing conditions resulting from high land prices, insecurity of tenure, and lack of loan finance, and
- Non-availability of piped water in more than 80 per cent of the households.

The environment of the capital city faces the triple threat of air pollution, inadequate solid waste management, and contamination of surface water. Given that economic activity in Dhaka contributes about one-fifth of the nation's GDP, environmental constraints to growth in the capital constitute a national priority.

3.3 Natural Resources Management

Land degradation and loss of soil quality

Land is a scarce resource in the country and there are conflicts from sectoral use and demand apart from unauthorized grabbing. Land zoning & proper land use planning is considered an utmost necessity. Land use in the country is diverse and often conflicting: it is intensively used for agriculture, settlements, forests, shrimphghers, natural fisheries, salt production, industrial and infrastructural developments and tourism.

Land degradation occurs in the form of loss of (i) soil quality through salinity intrusion, fertility decline, nutrient imbalance and (ii) top soil loss through erosion. The soils of Bangladesh, in general, are very fertile and productive. However, high cropping intensity, loss of organic matter and imbalanced use of fertilizer and pesticides have taken a very serious toll on overall soil health. Soil quality and/or productivity are also on the decline.

River bank erosion

Riverbank erosion is a perennial problem in Bangladesh. This particular problem imposes significant social hardship due to the loss of homesteads and agricultural land. A majority of the rivers are now under threat from encroaching and illegal dredging.

Contrary to the conventional approach, contemporary river management strategies comprise reducing hazards through precise forecasting and adoption of nonstructural measures such as strategic retirement of infrastructure and re-settlement of affected habitation, and on developing low-cost measures for erosion control. The National Water Management Plan (NWMP) calls for preparation of a master plan for river training on the basis of past and ongoing experience, and provision of bank stabilization works in combination to non-structural measures, which is considered to be a positive move forward.

Coastal & marine resources

Bangladesh's coast and marine zones are especially rich in many natural resources. The challenge is that natural resources in the coastal zone will have to be managed in a manner that will not only ensure their sustainability but will also secure access for the poor to these resources in meeting their livelihood needs. The strategies to meet this challenge include ecosystem management, coastal land zoning, integrated management of coastal waster infrastructures, environmental and socially responsive shrimp farming, and marine and coastal environmental development.

There are also pollution problems in coastal area form oil spillage and inadequate reception facilities in the ports, apart from land based sources of pollution – these all deserve attention for proper management.

Protection of rural landscape and improving environment

Pressure of overpopulation on limited land has resulted in several problems such as, growing need of homestead areas for settlement, continuous intensive use of the land & decrease in the productivity of land, land ownership conflict and migration of people from the rural to the urban areas.

The other rural area important environmental issues include, making provisions for water conservation in water stressed or drought prone areas and making required interventions that address persistent water logging problems in some other areas including salinity problems.

Protection of Land and Water Resources

Natural resources in Bangladesh are under constant threats from people with power, resources and political strength. These groups of individuals tend to utilize their strengths to exploit (in reality over-exploit) resources. As a result, natural resources like wetlands and forests are degraded and depleted. As such, the Government of Bangladesh declared 16 Protected Areas (PAs) and several Ecologically Critical Areas (ECAs). ECAs are already degraded areas and needs special protection and care while PAs are protected because their biodiversity and cultural heritages.

3.4 Forestry

The forestry sub-sector presently accounts for 2.93% of the GDP with annual growth rate about 5%. Official record of forest area is 2.5 million hectare or 17% of the total land area of the country, but practically it is far less than this figure. The forest area has declined due to clearing of forest land for cultivation, shrimp farming, industry, and settlements. However, the social/homestead and community forestry has significantly grown due to vigorous public sector campaign for plantation.

Most of the forests of Bangladesh are located in the Greater Districts of Chittagong, Chittagong Hill Tracts (CHT), Sylhet, Khulna, Dhaka, Mymensingh, and Tangail. The moist deciduous forests are found in Dhaka, Mymensingh, Rangpur, Dinajpur, and Rajshahi districts. Sundarbans Mangrove forest in the coast is a World Heritage Site. Additionally, plantations have been established on the newly accreted char land of the coastal areas totaling an area of 160,000 hectares.

The Sundarbans, the single largest tract of natural mangrove forest in the world, is located in the south western part of the country. But small patches of mangroves are present in nearly all coastal districts of Bangladesh. The total area of the Bangladesh portion of the Sundarbans is 6,017 sq.km, which represents 4 percent of the country's total land area and 40 percent of total forest land. Bangladesh also has about 132,000 ha of mangroves plantation established under different coastal afforestation programmes and projects.

The Sundarbans has been listed as Ramsar Site in May 1992. The Government of Bangladesh in 2003 provided an updated Ramsar Information Sheet on Sundarbans Ramsar Site, enlarging its area from 596,000 to 601,700 hectares (Ramsar Convention 2003). The Sundarbans has also been declared as a UNESCO World Heritage Site in 1997. The Sundarbans support more than 30 mangrove species (IUCN 1997) and is a hotspot of rich flora and fauna. It also helps to protect coastal regions against natural disasters such as cyclones and storm surges.

3.5 Biodiversity

There are many rivers and streams in the country covering a total length of 22,155 km. About 11% of the country's area belongs to different types of water bodies. In addition to the regular inland waters, seasonally a large part of the country remains submerged for 3-4 months during monsoon. Haor basin in north-east region of the country is such an important wetland. The wetland system is a vast repository of bio-diversity. The wetland ecosystems have been suffering due to contaminated agricultural runoff which contains fertilizer and pesticide residues.

The Government in 1999 declared 8 areas as Ecologically Critical Areas (ECAs) including Cox's Bazar and Teknaf Peninsula, St. Martin's Island, Sonadia Island, Hakaluki Haor, Tanguar Haor and MarjatBaor, the Gulshan-Baridhara Lake and 10 km land ward periphery of Sundarbans. Later in 2009, 4 rivers around Dhaka city (Buriganga, Sitalakhya, Balu and Turag) were declared as ECAs. The GEF/UNDP assisted project titled Coastal and Wetland Biodiversity Management at Cox's Bazar and Hakaluki Haor (CWBMP)' which is being implemented by the Department of Environment, has been undertaking various programs towards conservation of the biological diversities of 4 ECAs namely Cox's Bazar- Teknaf Peninsula, Sonadia Island, St. Martin's Island and Hakaluki Haor. Most of the ECAs are suffering from encroaching, pollution and management problems in terms of sustainability.

Homestead ecosystem

About 20 percent of Bangladesh is covered with settlements, much of which is covered with plants. According to the National Forest and Tree Resources Assessment 2005-07, the area of rural settlement with tree cover stands at 2.767 million ha of which about 45 percent of land has over 10 percent tree cover. Homestead vegetation is a very important plant community, not only for its plant resources but also as wildlife refuge. According to the assessment the average gross and commercial volume of timber produced by the homestead ecosystems it about 36.1 M³ and 28.2 m³ per hectare respectively. The commercial volume per hectare of homestead ecosystem is comparable to that of a forest area (29.7 m³ per hectare). The Homestead ecosystems are very important for providing shelter to wildlife as well as for protecting infrastructure against winds and cyclones.

Loss of wetland

With the loss of wetlands, the open water fisheries production is declining in Bangladesh. Besides their benefits to fisheries, wetlands function as retention area that controls floods, recharges the ground water, and works as irrigation water source etc.

The following impacts of degradation of the wetlands of the country have been identified:

- Serious reduction in fish habitat, fish population and diversity;
- Extinction and reduction of wildlife including birds, reptiles and mammals,
- Extinction of many indigenous varieties of rice with the propagation of high yielding varieties;
- Loss of many indigenous aquatic plants, weeds and shrubs;
- Loss of natural soil nutrients;
- Increase in the recurrence of flashfloods;
- Deterioration of living conditions;
- Loss of natural water reservoirs and of their resultant benefits; and
- Degeneration of wetland-based ecosystems, occupations, socio-economic institutions and cultures.

4. MULTILATERAL ENVIRONMENTAL AGREEMENTS (MEA'S) AND THEIR IMPLICATIONS

4.1 MEA'S

Bangladesh has so far signed, ratified and or accessed 35 international Conventions, Treaties and Protocols (ICTPs). Among them the following ICTP's received attention of the government for follow up implementation.

- Stockholm Convention On Persistent Organic Pollutants
- Vienna Convention For The Protection Of Ozone Layer
- Montreal Protocol On Substances That Deplete The Ozone Layer (1987)
- Un Framework Convention On Climate Change (UNFCCC) 1992
- Kyoto Protocol To The Un Framework Convention Climate Change (1997)
- United Nations Convention On Biological Diversity (CBD)
- Cartagena Protocol On Bio safety
- Convention On Wetland Of International Importance Especially As Waterfowl Habitat (Ramsar Convention)
- Convention On International Trade In Endangered Species Of Wild Fauna And Flora (Generally Known As CITIES)
- United Nations Convention To Combat Desertification
- Basel Convention On The Control Of Transboundary Movements Of Hazardous Wastes And Their Disposal
- The United Nations Convention On The Law Of The Sea
- The International Convention For The Prevention Of Pollution From Ships, 1973, As Modified By The Protocol Of 1978 Relating Thereto (Marpol 73/78)
- Minamata Convention on Mercury
- Nagoya Protocol on Access and Benefit sharing

4.2 Review Analysis

In many cases, no significant progress has been made in relation to the implementation of various ICTPs excepting a few ones. The principal actor in the domain of ICTPs in Bangladesh is the Ministry of Environment & Forests, (MOEF) created in 1989, with the Department of Environment (DoE) and the Department of Forests (DoF) acting as the technical arm of the MoEF for implementation of the ICTPs. These institutions have limited manpower and financial resource backup in addressing the implementation issues of ICTPs. In the Department of Environment, one small section has been created to look after all the ICTPs.

Two separate cells, namely Ozone Cell & Climate Cell have been created in DoE under separate projects. Existence of these cells has lent momentum to the development, implementation of climate conventions and Protocol and ozone related convention & Protocol over the years.

Biodiversity is another important area, where some implementation measures have been undertaken under different project support, but no cell has been created. Issues related to implementation of conventions on chemicals have also been attempted. A countrywide survey on

Persistent Organic Pollutants (POPs) under Stockholm Convention has been completed along with some limited Studies conducted on assessing the nature and quality of hazardous wastes generated in the country. The three other conventions, namely CITES, Ramsar and CCD are also looked into by MOEF through its agencies DOE & DOF, but the responsibilities are shared. Activities pertinent to implementation of the conventions are still limited. Apart from these conventions, two other conventions that Bangladesh counts upon are UN Convention on the Law of the Sea AND the MARPOL are being looked into by the Ministry of Foreign Affairs and the ministry of Ministry of Shipping respectively.

In general, there is lack of understanding and awareness among the decision makers and others concerned, regarding the urgency, necessity and methodology or ICTPs implementation. They are often not prioritising these ICTPs in light of national interests and priorities. There is a great deal of lack of understanding in that, these ICTPs are not just obligations, but also offer a number of opportunities which the country should try to tap for its own development and environment improvement.

As often no focal point or nodal agency is effectively earmarked for the implementation of a Particular ICTP, it is handled as if that particular ICTP is 'nobody's baby' to take care of.

Participation in the negotiation and subsequent adoption and implementation stages is handled mostly on an "ad hoc basis". Generally no attempt is made for rational continuity of 'persons' or 'document'. Very little attempt is made to develop the right kind of expertise in the concerned agencies. The reporting system (alongwith its preservation) related to participation in meetings regarding ICTPs, is very weak and often proper report is not submitted after return, which further hampers the continuity. Negotiation is considered for those who matter in the decision making but are not cut out for this job, an opportunity for foreign tour but not a real business for countrys' interest.

After ratifying or accessing an ICTP, sectoral laws are not reviewed to incorporate newly required provisions. Environmental legal drafting field is still very weak and expertise is inadequate. Donor support in properly implementing ICTPs to suit the country's need of development and environment protection is still very limited.

One of the reasons for the weakness of the existing institutions is the lack of continued leadership both in the Ministry of Environment and Forest and Department of Environment. Rapid and random transfer of senior policy makers make it difficult to maintain serious policy continuity and representation in the global environmental area. Environment is a very demanding area which needs high technical and negotiation skills and capacity to coordinate with other institutions-national and global. This requires continued efforts and development of skilled manpower.

Lack of coherent and effective institutional coordination as well as limited trained manpower, physical infrastructure and facilities are the major capacity constraints limiting institutional performance in addressing cross cutting issues on MEAs. Strong coordination between institutions and adoption of an integrated approach are fundamental in ensuring synergistic implementation of the MEAs. This can be achieved by establishment and strengthening collaboration between institutions through formation of relevant committees and networks, development of guidelines for joint actions and mainstreaming of MEAs into planning processes.

DoE has become the natural institutional home for most of the ICTPs Bangladesh signed and ratified excepting a very few. It has limited capacities in terms of manpower, technical back up and financial resources for follow up activities. There are institutions and individuals who have the expertise to undertake research, advocacy, and policy formulation on various ICTPs. The best options for DOE are therefore to develop partnership with relevant institutions and to prioritize the ICTPs which Bangladesh must address promptly and adequately. On the other hand, international convention wings of DoE must be strengthened with additional manpower and budgetary provisions.

4.3 Actions needed

i) ICTP Implementation Program: Detailed implementation Programme for each environment related ICTP signed, ratified or accessed by the Government be prepared (alongwith assessment of needed legal changes, resources required both financial and institutional, need for further human resource development etc.).

ii) Monitoring of Implementation: Monitoring of ICTP implementation in the country be carried out on a regular basis for all environmental ICTPs. Each nodal agency for such implementation will do its in house monitoring fulfilling set criteria and guidelines. Besides there will be regular independent outside monitoring and technical guidance (e.g. by an agency like IUCN) for such implementation of ICTPs.

iii) Human resource development and capacity building: This is a prerequisite for proper understanding and subsequent implementation of any ICTP. This is to be done in all concerned agencies and also general awareness among all be taken care of as part of this where necessary. Continuity in this regard will be also important, as has been discussed later more elaborately.

iv) Nodal Agency/Focal Point: Nodal agency or focal point for implementation of each ICTP be very clearly identified and be made responsible for proper implementation. This agency may wish to work to implement the ICTP involving various other Committee, cell, Resource persons, agencies etc. Role of Ministry of Environment and Forest, and the Ministry of Foreign Affairs regarding ICTP implementation needs is to be very clearly delineated.

v) Resource Mobilization: The dismal global commitment to fund ICTPs issues, the low priority accorded to these at national and regional levels, and limited capacity of institutions to prepare timely and acceptable proposals are serious constraints to resource mobilization for implementation of ICTPs. This is further constrained by the stringent and very low GOB budget ceilings for the key sectors of environment, forest and agriculture. On the other hand, a number of opportunities for resource mobilization and mainstreaming of ICTPs exist: These include the periodic review of national and sectoral development plans, the annual-budgeting process, the decentralized finance flows for development programs, and the expanded GEF (Global Environment Facility) portfolio funding for sectors that include land degradation and deforestation as focal areas.

In order to enhance national capacity for mobilizing resources, action should be taken to train actors in preparation of multidisciplinary proposals, and for management and sharing of information on availability and means of accessing both domestic and external resources. Furthermore, specific measures should be taken to promote partnerships with a view to mobilizing resources from various actors. Such measures should include training in negotiation skills, development of guidelines for mainstreaming ICTPs in both national plan and budgeting

frameworks, organizing partnership forum, increasing advocacy for ICTP issues and sensitization of the private sector on their role in implementation of ICTPs and the possible sources of funds (e.g. carbon funds). It is expected that these measures will enhance the integration of ICTPs into national development plans and improve the capacity of key actors in mobilizing resources for programmes on ICTPs.

5. GOVERNANCE

5.1 Environmental Governance

Across all of the issues within this field, improving environmental governance remains an overarching theme. The most important governance elements include access to environmental information, strengthening EIA system as an environmental management tool, transparency and consultation for accountable decision-making, adequate institutional capacity for credible enforcement, and economic policies that promote improved environmental performance.

So-called "command and control" model of pollution control, imported from industrial countries, has failed to cut poisonous discharges. This approach, which is widely used by government regulators, sets maximum pollution levels and then fines companies that exceed them. Where enforcement agencies are weak - companies run little risk of being caught and punished. Therefore, polluting firms which violate regulatory standards have little incentive to clean up their activities, and firms that do respect legal limits have even less incentive to cut their pollution.

To address these limitations, a new approach is necessary. For *Greening Industry*, the community/ key stakeholders should play a monitoring role which combines market-based incentives and public information disclosure to encourage factory managers to improve their environmental performance while they are pursuing profits.

Institutional capacity for credible enforcement: Strengthening the role of the DoE

As the credible threat of regulatory enforcement is central to environmental governance, so too is the establishment of the institutional capacity to deliver such enforcement. For this reason, implementation of the Department of Environment's (DoE's) *Strategic Plan* is essential to strengthen environmental governance in Bangladesh, as it will provide the DoE with the resources and incentives it needs to fulfill its mandate. Despite its critical and wide-reaching mandate, the DoE currently receives only a small portion of the annual budget. In addition to a significant increase in resources, a key element of the Strategic Plan is the creation of civil service cadre positions for DoE staff, which will do much to improve the quality of applicants and strengthen incentives for staff performance. Implementation of the Strategic Plan will also allow the DoE to bring more environmental cases to court, which is essential to build the credibility of the Government's environmental intentions.

Economic policies and incentives for improved environmental performance

While information and regulatory enforcement help establish incentives for improvements in environmental quality, these are most effective when combined with supportive economic policies. An important element in the battle to curb urban air pollution will be to ensure that the sulphur content of imported diesel is reduced to 500 ppm, reflecting the economic cost of the health damage caused by lower quality fuel. Economic incentive scan also be used to complement regulatory approaches to improve environmental management. In the case of industry, there is scope for this to be achieved through the promotion of waste-minimization and

eco-labelling initiatives. Regulatory measures may also be considered, to ensure environmental standards across various sectors are sufficient for the long term sustainable operation.

Transparency for accountable decision-making

Transparency and public consultation are essential elements of environmental decision-making. , Strengthening the accountability of environmental institutions would assist to build their credibility and reputation. There is considerable scope to introduce greater transparency in the decision making process. At the local level, for example, the issuance of No Objection Certificates could be subject to consideration by an open meeting of the Union Parishad, and at the national level all EA information should be publicly available, with high-risk or significant projects presented for public review.

Strengthening EIA systems as environmental management tool

The EIA process is an opportunity to enhance project design by providing sustainable development options based on environmental and social considerations, as well as the economic benefits of a project. Its holistic approach ensures that the proposed development meets the ends of environmental management, and minimizes future costs of environmental damage and liabilities that developers might face. EIA is in practice now. But, the EIA system in terms of processing & implementation and from legal point of view requires strengthening. There is a considerable scope to broaden the public consultation in the EIA process. A separate rule on EIA with all the necessary measures in the processing and implementation of EIA has become a critical need.

Policy Opportunities

There are policy opportunities for greening the environment as evident from the following features.

- Environment protection is the constitutional obligation.
- Policy initiatives, strategies and plans emphasize on sustainable natural resources management.
- Strong, GO/NGO partnership in the implementation of policies both on environment & climate change in MOEF.
- Environment quality standards (EQS) for ambient water quality, air quality, noise and effluent/ emission discharges standards have been set.
- EIA has been accepted as mandatory tool to identify and predict impacts and undertake proper mitigation measures in the execution of a project. A good number of Sectoral EIA guidelines have been prepared to assist the process.
- Transparency & accountability through disclosure of EIA & public hearing.
- Acknowledges linkage between poverty, population pressure, illiteracy, inadequate health care and environment management in achieving sustainable development.

Weakness and gap

Some of the policies/ provisions need further be improved/ introduced for an effective new regime. These include:

- EIA has now become a strong tool in decision making prior to awarding clearance. But, the EIA system in terms of processing & implementation and from legal point of view has remained weak. There is a considerable scope to strengthen the EIA processing and implementation.
- Most of the developing Ministries and agencies escape the EIA process for their development projects. There is also a need for introducing strategic EIA as a planning tool for all sectoral level planning.
- DoE routinely does the public hearing. But, to make it meaningful, provision in section 8(2) of the BECA is to be strictly followed. However, this programme has increased its accountability. But, people from far flung areas can not take this opportunity. It will also be useful to organize public hearing in different hot spot areas around the country.
- Transparency and consultation for accountability are essential elements in environmental decision making Strengthening the process of accountability of environmental institution would make them credible.

5.2 Forestry Governance

Manpower shortage

For a country with a population of 140 million, current manpower in FD is inadequate to ensure protection of forest resources or undertake country wide awareness campaigns.. The FD also lack sufficient forest guards, and their technical capacity is low. With the passage of time it is expected that the FD's management approach should target "sustainable ecosystems". Thus technically sound and knowledgeable personnel will be essential to make on the spot management decisions. This will require Foresters, Deputy Rangers, and Forest Rangers to be well qualified, trained and updated on latest issues so that the best management decisions are taken and implemented in a correct manner.

Plantation management

There is no doubt that natural forests are deteriorating and their depletion is a continuous process. The health and overall structure of the forests are 'below average'. However plantations (afforestation) have a different scenario. Almost all plantations are established under some sort of development programme by projects. Reasonable funding is available from project funds for establishing the plantations. During the project period, funds are also made available from projects for the maintenance of the plantations for about three years. The maintenance and subsequent care of these plantations is generally vested with the FD from the fourth year of establishment. By the fourth year the seedlings have reached pole size and start attracting local people. Pilferage and illicit felling starts at this stage. It is a 'Herculean task' for the FD to ensure protection with the scanty number of FD staff at the ratio of 1: 14,000 people. The resultant impact is continual depletion of the stock from the plantations, as they grow to pole size. As this

continues the plantations have a “scattered tree” appearance at 15 to 20 years. The plantations that appeared promising at the initial stage, usually fail at 15 to 20 years of age. This scenario however, is not valid for the plantations that have been established under social forestry programmes involving the participants. In the case of participatory plantations the participants work as a very strong force to combat theft and pilferage.

Fund crisis

Shortage of funds, impair the materialization of the long-term visions and commitments. Although the FD is intended to function with a long-term vision, it cannot be maintained, mostly due to non-commitment of funds. This lack of fund meant the FD could not go ahead in accordance with the Forestry Master Plan (prepared under ADB funding) and National Forest Policy. The FD is project oriented. In the past, during the fifties and sixties, almost 95% of the FD’s budget used to come from the revenue exchequer. During the last couple of decades it has completely turned around and now over 80% of FD expenditures are met from development budget (project funding). When there is no project, there is no funding for forestry activities. The flow of development funds is discrete and cannot be the basis for the long-term vision oriented programme, required for the forestry sector. Under such circumstances the FD is increasingly becoming dependent on short-term projects. Every time a project comes to an end after 4 or 5 years, all benefits are lost because of discontinuity. The funding crisis is the most serious problem for the FD in achieving sustainability.

Monitoring and accountability

Monitoring is the key to accountability. Except for routine hierarchical supervision, the current institutional mechanism does not have provisions for systematic and regular monitoring of the FD’s activities, especially at the field level. Though there is a CF monitoring in the office of the CCF, he can hardly undertake any monitoring of field activities, since he has no staff required for the purpose. For all practical purposes there is no systematic monitoring in the FD. In the absence of a good monitoring system, the accountability of FD personnel cannot be ensured. Participatory monitoring is a critical need with stakeholders engagement in sustainable natural resources management.

Land litigations

The FD has the total responsibility for RF lands and the Forest Act (amended in 2000) is supposed to provide the necessary legal back up for their management, protection and conservation. Besides, there are about 0.6 mha of land that have been notified under Section 4 of the Forest Act and have been under the process of reservation for a long time. This process depends on civil administrative personnel and receives the least or no priority. As a result, most of these cases have been hanging for decades.

6. REVIEW OF ENVIRONMENTAL SUSTAINABILITY IN MAJOR SECTORS OF ENVIRONMENT USING DRIVERS-PRESSURE-STATES-RESPONSES FRAMEWORK

The government recently adopted Vision 2021 in recognition of the long-term development challenges. Vision 2021 and the associated Perspective Plan 2010-2021 have set solid development targets to transform the socio-economic environment of Bangladesh from a low income economy to the first stages of a middle income economy. Vision 2021 has also laid down a development scenario where citizens will have a higher standard of living, will be better educated, will enjoy better social justice, and will have a more equitable socio-economic environment, while the sustainability of development will be ensured.

The 6th Five-Year plan includes governments accomplishments and strategic outlook on the environment, forestry, climate change and disaster management areas in its Strategic Directions and Policy Framework (Part-1, Chapter 8). The budgetary projection of the 6th Five-Year Plan including allocation for the environment sector is shown in the Table 1.5.

Table-1.5: **Sixth Five-Year Plan Sectoral Public Investment Allocation** (Crore Taka; FY2011 price, 1 USD=80 BDT Appx.)

Broad. Sectors	FY11	FY12	FY13	FY14	FY15	Total SFYP	% of total
Agriculture, Water and Rural Development	3,623	4,121	4,535	5,184	5,756	23,220	8.7
Manufacturina and Trade	702	755	776	857	919	4009	1.5
Eneruv	6,075	7,983	8,932	10,539	12,127	45,656	17.3
Transport	5,370	7,153	8,147	9,670	11,172	41,512	15.7
Urban	8,578	9,381	9,950	10,972	11,776	50,656	19.1
Knowledge Economy	434	483	517	575	621	2,631	1.0
Education, Training, Sports, Culture and Religion	5,544	6,659	7,578	8,918	10,240	38,940	14.7
Population, Health and	3,473	4,185	4,698	5,570	6,439	24,364	9.2
Social Inclusion and Social Protection	444	462	500	564	615	2,586	1.0
<i>Environment, Climate Change and Disaster Management</i>	1,667	2,013	2,070	2,322	2,516	10,588	4.0
Public Administration and Others	3,704	3913	4129	4487	4,779	21 012	7.9
Grand Total	39,615	47,108	51,832	59,659	66,960	265,174	100

Source: Planning Commission 2010

DoE recently conducted a study on major sectors of environment using Drivers-Pressure-States-Impacts-Responses framework to investigate the sustainability question. Study findings on two Sectors namely *Land Resources* and *Water Resources* are furnished below.

6.1 Land Resources

Land degradation is a serious problem for Bangladesh because loss of topsoil through water erosion, river bank erosion, declining land productivity and gradual shift towards negative nutrient balance in the soil and mining or quarrying for extraction of stones, clay and sand. The food security, life and livelihoods of the marginal section of society are going to be further challenged due to land degradation exacerbated by climate change. Impacts of climate change on land are multifaceted.

Impacts of land degradation include reduced soil productivity, loss of arable land, food insecurity, loss of ecosystems, goods and services and migration of population. The significant drivers and associated pressures causing land degradation, the impacts of land degradation and policy responses addressing the vital issues and capacity needs have been summarized in a DPSIR framework in Table 1.6.

Table 1.6: **DPSIR Framework on Land Resources**

Drivers	Pressures	States	Impacts		Policy responses	
			Natural impact	Human Social and economic	Capacities available	Lacking
Non-climatic Drivers						
Population Pressure and Poverty	<ul style="list-style-type: none"> • Over-utilization and unsustainable use of land resources • Cultivation on steep slopes 	<ul style="list-style-type: none"> • Decreased agricultural and Natural Forestland and Wetlands • Area of Degraded land increased 	<ul style="list-style-type: none"> • Degradation of Ecosystem • Erosion of fertile soil 	<ul style="list-style-type: none"> • Scarcity of land for cultivation 	<ul style="list-style-type: none"> • Established Directorate for Family Planning under MOHFW 	<ul style="list-style-type: none"> • Mass awareness and strict regulations on birth control
Unsustainable Agricultural Practices	<ul style="list-style-type: none"> • Over-use of agri-land and agri-inputs like chemical fertilizer and pesticides 	<ul style="list-style-type: none"> • Reduced soil fertility and increased land degradation • Reduced ground water availability 	<ul style="list-style-type: none"> • Top Soil erosion • Degradation of Soil Structure • Acidification • Pan formation 	<ul style="list-style-type: none"> • Crop Yield reduction • Arsenic • Crop Yield reduction • Arsenic contamination • Leaching of soil nutrients 	<ul style="list-style-type: none"> • Agricultural Extension and Research System • Extended network of DAE and BADC • Application of IPM, IPNS, Green Manuring and Crop diversification programmes 	<ul style="list-style-type: none"> • Enhancing Inter-agency Coordination • Updated AEZ Map • Location specific adaptations to Climate Change

Unplanned Infrastructural development	<ul style="list-style-type: none"> • Development of Road bridge, culvert, dike • Unplanned housing • Industrial effluents and emissions 	<ul style="list-style-type: none"> • Loss of agricultural land • Decrease wetland area and aquatic resources • Fragmentation of habitat 	<ul style="list-style-type: none"> • Degradation of Terrestrial and Wetland Ecosystems, • Water logging 	<ul style="list-style-type: none"> • Crop production decreased • Agri-business expanded • Temporary increase of GDP 	<ul style="list-style-type: none"> • Bangladesh National Building Code • Environmental Guidelines of RHD and BWDB • Detailed Area Planning of Dhaka City 	<ul style="list-style-type: none"> • Detailed land zoning and Landuse/ Physical Planning for the whole country • Detailed Area Planning for all the cities
Unplanned Industrial Development	<ul style="list-style-type: none"> • Improper disposal of industrial waste • Ship breaking activities • Mining of sand, clay and pebbles 	<ul style="list-style-type: none"> • Loss of agricultural and forest land 	<ul style="list-style-type: none"> • Terrestrial and aquatic ecosystem degradation 	<ul style="list-style-type: none"> • Productivity and employment increased • Decrease of agri-land • Scarcity of land • Increase of land price • Depletion of Ground Water 	<ul style="list-style-type: none"> • Landuse Policy 2001 • Bangladesh Environment Policy 1992 • Environment Conservation Act 1995 • Environment Conservation Rules 1997 	<ul style="list-style-type: none"> • Institutional structure for implementation of landuse policy • Zonation for various industrial sectors • Environment Management System in the premises of industries
Climatic Drivers						
<ul style="list-style-type: none"> • Flood • Drought • Cyclone • Erratic Rainfall • Sea level Rise 	<ul style="list-style-type: none"> • Land Erosion • Water logging • Salinity intrusion 	<ul style="list-style-type: none"> • Degraded Land 	<ul style="list-style-type: none"> • Degradation of ecosystems like mangrove 	<ul style="list-style-type: none"> • Loss of livelihoods, Impaired Food security 	<ul style="list-style-type: none"> • Developed NAPA and BCCSAP. • Funding through CCTF and BCCRF 	<ul style="list-style-type: none"> • Adequate Resources and Technology to address climatic impacts

6.2 Water Resources

Water pollution is a serious environmental concern in the country emanating from industrial discharges, municipal wastes, agrochemicals, salinity intrusion and arsenic contamination. Pollution does not only compromise water quality but also affects health by accumulation of toxic substances in the food chain. Degradation of water quality worsens during dry the dry season where as during the monsoon remains with tolerable limits.

The significant drivers and associated pressures causing degradation of water quality, the state and impacts of water pollution and policy responses addressing the vital issues are summarized in a DPSIR framework in Table 1.7

Table 1.7: **DPSIR framework on Water Resources**

Drivers	Pressures	States	Impacts	Policy responses
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			Natural impact	Human Social and economic	Capacities available	Lacking
Non-Climatic Drivers						
Population increase	<ul style="list-style-type: none"> • Increasing demand of water • Increased Pollution load due to human waste • Encroachment of waterbodies and wetlands 	<ul style="list-style-type: none"> • Waterbody Encroached • Waterbodies and wetlands Degraded • Contamination and pollution of surface and ground water • Prevalence of vector-borne diseases 	<ul style="list-style-type: none"> • Increased pollution degraded ecosystem services 	<ul style="list-style-type: none"> • Food supply and production hampered • Worsening of Poverty • Increased cost for health and sanitation management 	<ul style="list-style-type: none"> • Established Directorate for Family Planning under MOHFW • National Policy for Water supply and sanitation 1998 • Formulated Solid Waste Management Rules 	<ul style="list-style-type: none"> • Mass awareness on birth control • Strict regulations to control sewage wastes • Adequate enforcement to stop encroachment
Industrial and agricultural wastes including unsustainable agriculture and excessive use of agro-chemicals	<ul style="list-style-type: none"> • Pollution load from effluents and sludge • Discharge of heavy metals, • Dry season irrigation depleted ground water table • Excessive or unnecessary use of chemical pesticides and fertilizers 	<ul style="list-style-type: none"> • Quality and quantity of surface and ground water resources declined • Arsenic level in Ground water Increased • Soil fertility declined • Increased level of pollutants 	<ul style="list-style-type: none"> • Disappearance of aquatic life especially tasty fish species which were once abundant in the open water • Polluted surface and ground water resources led to scarcity of potable water • Impact on aquatic biodiversity 	<ul style="list-style-type: none"> • Increased risk of water-borne diseases • Accumulation of toxic and hazardous pollutants in the river water and along the river-bed • Arsenic contamination leading to kidney, lung damages • Lose of agro production 	<ul style="list-style-type: none"> • Conducting EIA and installation of ETP mandatory under BECA 1995 and ECR 1997 • NWMP 2004 • National Land Use Policy 2001 • National Agriculture Policy 2009 • National Policy for Arsenic Mitigation 2004 • Hazardous Waste and Ship Breaking Rules 2011 • Drafted Banglade 	<ul style="list-style-type: none"> • Awareness among the proponents to install and operate ETP • Adequate monitoring and enforcement to implement Polluter- Pay-Principle • Appropriate zonation for industries • Sustainable irrigation techniques to ensure water use efficiency • Adequate recycling options

					sh Water Act	
Upstream interventions	<ul style="list-style-type: none"> • More withdrawal from dry season flow • Increased flow during monsoon • Change in sediment load • 	<ul style="list-style-type: none"> • Reduction of dry seasons flow • Increased intensity of floods and drought • River bank erosion • Siltation • Salinity Intrusion 	<ul style="list-style-type: none"> • Hampered irrigation schemes • Fresh water availability reduced • Sundarbans: the mangrove ecosystem degraded • Desertification in the water scarce areas • Reduction of Wetland 	<ul style="list-style-type: none"> • Scarcity of Potable water • Hampered economic activities • Lack of navigability 	<ul style="list-style-type: none"> • Ganges water treaty • Research organizations IWM, CEGIS, IWFM, and JRC are working with river studies 	<ul style="list-style-type: none"> • Adequate cooperation and collaborative research on Basin-wide management of trans-boundary water resources in the region • Adequate negotiation skill on water management and sharing issues
Climatic Drivers Frequent Flooding, Drought, Cyclone, Erratic, Rainfall, Sea level Rise	<ul style="list-style-type: none"> • Stressed Life and livelihood due to Excessive Water or Acute Shortage of Water 	<ul style="list-style-type: none"> • More inundation of land • Increasing drought conditions • Salinity Intrusion 	<ul style="list-style-type: none"> • Degradation of ecosystems and Biodiversity • Crop damage • Scarcity of drinking water • Salinization in the coastal areas • Increased Erosion and siltation 	<ul style="list-style-type: none"> • Loss of Lives, Resources and livelihoods • Impaired food security • Migration due to erosion and inundation 	<ul style="list-style-type: none"> • NAPA, BCCSA P National Coastal Zone Policy 2005. NWMP2001. Established CCTF and BCCRF 	<ul style="list-style-type: none"> • Adequate Resources and Technology to address climate impacts • Regional Modelling downscaled to local level

7. REVIEW ANALYSIS OF 6TH FYP, SETTING THE TARGETS AND DEVISING THE STRATEGY AND RECOMMENDATION FOR 7TH FYP ON ENVIRONMENT SECTOR

7.1 Review analysis on 6th FYP

The MOEF is formulating and implementing policies and programs that ensures a balance between the existing livelihood requirement of the people and sound environmental resource management that can ensure sustainability. Programs undertaken by the DoE include enforcement of the environmental laws to control and prevent pollution and degradation, raising awareness on environment, environmental management and its monitoring, implementation of the international conventions and protocols signed by the government and programmers to maintain the natural environment and improve the degraded environment of the country.

During sixth plan period, DoE has implemented the following projects:

- Institutional Strengthening for the Phase-out of ODS (Phase-VI).
- Clean Air and Sustainable Environment (CASE) Project (Environment Component).
- Submission of Second National Communication (SNC) to UNFCCC Project.
- National ODS Phase-Out Plan UNDP Component.
- Bangladesh Coastal and Wetland Biodiversity Management Project.
- Project Preparation towards Implementation of National Biosafety Framework.
- Phase-out of CFC consumption in the Manufacture of Metered Dose Inhalers (MDIs) in Bangladesh.
- Conversion from HCFC-141b to Cyclopentane technology in the manufacture of insulation foam in domestic refrigerators at Walton Hi-Tech Industries Ltd, Bangladesh.
- Bangladesh Brick Kiln Efficiency Project.
- Bangladesh Environment and Climate Change Outlook (ECCO).
- Updating and Mainstreaming of National Biodiversity Strategy and Action Plan (NBSAP) for Bangladesh.
- Bangladesh: Revision and Alignment of National Action Program (NAP) with UNCCD 10-years Strategic Plan and Framework.
- Implementation of the National Biosafety Framework of Bangladesh (INBF)
- Community Based Adaptation in the Ecologically Critical Areas through Biodiversity Conservation and Social Protection.
- Implementation of Waste Reduce, Reuse and Recycle (3R) Initiative in Gulshan, Baridhara, Gonobhoban (Mohammadpur), Azimpur and Dhanmondi in Dhaka and Nasirabad and Khulshi in Chittagong cities.
- Programmatic CDM' through utilization of waste in all towns (Municipalities) of Bangladesh.

- Modernization & Extension of Chittagong Divisional Laboratory of Department of Environment to strengthening the monitoring & assessment system due to the adverse impact of climate change.
- Market Development Initiative for Bondhu Chula.
- Environment Friendly Management of Poly-Packaging Waste to reduce water logging and adverse impact of Climate Change.

Among them CASE project is the only notable investment project implemented by DoE.

In line with the objective target set for environmental sustainability in 6th FYP. DoE has also been able to undertake measures to amend certain Acts and Rules to better enforce the law to protect the environment from further degradation. These include:

- Bangladesh Environment Conservation Act, 1995 (Amendment 2010).
- Environment Court Act 2010
- Hazardous Waste and Ship Breaking Waste Management Rules, 2011
- Bangladesh Bio-safety Rules, 2012
- Brick Manufacture and Brick Kiln Installation (Control) Act, 2013

The following acts and rules have also been drafted during SFYP:

- Bangladesh Biological Diversity Act, 2013 (Cabinet approved in principle)
- Solid Waste Management Rules, 2013
- Ecologically Critical Area Management Rules, 2013. E-waste Rules, 2013.
- Odor Control Rules 2012.

During this plan period the government has adopted Article 18A in the Constitution of the People's Republic of Bangladesh by incorporating environment and biodiversity conservation and development as the key state policy. The policy states: "The state shall endeavor to protect and improve the environment and preserve and safeguard the natural resources, bio-diversity, wetlands, forests and wild life for the present and future citizens."

It has also developed generic EIA guidelines for various sectors for proper environment management. These are: a) Sector-wise Industrial Guideline on Cement b) Sector-wise Industrial Guideline on Textile, c) Sector-wise Industrial Guideline on Fertilizer d) Sector-wise Industrial Guideline on Pulp and Paper, e) EIA Guidelines for Pharmaceutical Industry, f) EIA Guidelines for Textile Industry, g) EIA Guidelines for Natural Gas Sector, h) EIA Guidelines for Natural Gases Sector (Down Stream), i) EIA Guidelines for Coal Mining, j) Inspection and Enforcement Manual, k) Environmental Prosecution Manual, m) Guide for Assessment of Effluent Treatment Plants, l) EIA Guidance Manual, m) Hazardous Waste and Ship Breaking Wastes guideline n) Guideline on Environmental Management, Waste Treatment and Worker's Occupational Health and Safety for Ship Breaking Yard, 2011.

7.2 Environmental Management Objectives in 7th FYP

To secure a clean and healthy environment toward achieving a high quality of life for the benefit of present and future generations, the Government of Bangladesh may set a number of goals to attain a sustainable environment and to address the climate change issue. The main objectives relating to environment and climate change under the 7FYP can be described in the following manners:

- To promote appropriate environment management system for sustainable development.
- To ensure conservation of biodiversity, its sustainable use and fair and equitable sharing of benefits.
- To ensure active participation of the poor, especially the women in environment management activities at all levels.
- To promote environment friendly activities in development of interventions.
- To monitor, control and prevent environmental pollution and degradation related to soil, water and air.
- To strengthen the capability of public and private sectors to manage environmental concerns.
- To initiate actions with regard to obligations under international treaties and conventions for minimizing adverse impact on global environment.
- To promote cooperation with regional and international institutions/ organizations to address local, regional, and global environmental problems.
- To build capacity in the area of environmental health through both public and private sectors.
- To promote Bio-medical waste management system.
- To prepare and implement sustainable management system for Ecologically Critical Areas (ECAs).
- To undertake research and development for innovating technology in national perspective and application of modern technology, information exchange and benefit sharing with other countries.
- To create public awareness, in order to build environment sensitive citizen and to create enable situation to participate in environment promotion activities.
- To undertake Environmental Assessment and environmental reporting.
- To promote 3R (Reduce, Reuse and Recycle) for all kinds of waste management initiatives.
- To formulate a policy for Extended Producers Responsibility (EPR).
- To improve air quality through promoting clean fuel and vehicle.
- To promote public-private partnership in environment management.
- To reduce dependency on fossil fuel by promoting solar/green energy.
- To improve air quality in major cities through monitoring and prevention measure.
- To promote Environment Management System (EMS) in Industries for pollution control.
- To continue the initiative for mainstreaming poverty-environment-climate-disaster nexus in the development project design, budgetary process, project implementation and monitoring process.
- To promote Strategic Environmental Assessment (SEA) as a planning tool.

- To setup a National Environmental Library and Documentation Center in DoE with knowledge and data hub.

7.3 Environmental Management Strategies in the 7th FYP

In order to fulfill the objective of the Seven Five Years Plan (7th FYP) the following policies, strategies and programs could be undertaken during the 7th FYP:

- Environment committees at Division, District and Upazila levels will be made more functional with the participation of all stakeholders.
- National Environment Council headed by the Prime Minister and Executive Committee of National Environment Council headed by the Minister for Environment and Forests will be made more functional.
- Drafting of EIA guidelines for all sectors under the Environment Conservation Act (ECA) 1995 will be formulated in order to ensure effective enforcement of EIA. Drafted EIA guideline will be made operational.
- Existing environmental laws and regulations will be amended to address new environmental issues.
- Department of Environment will be strengthened in the light of existing Environment Policy, Environmental Act, Rules and Environment Management Action Plan in order to coordinate, monitor and implement these activities.
- ‘Polluters Pay Principle’ will be followed in order to ensure strict compliance of environment legislation.
- In parallel market based incentives in pollution control will also be promoted.
- Public information disclosure will be given a priority.
- Sectoral legislations will be reviewed and redrafted in light of Bangladesh’s commitments expressed through signing and ratifying of a number of International Conventions and Protocols on environment.
- Incentives, in the form of tax-rebate, tax-holiday etc. will be provided and incremental cost incurred by the Environment-friendly entrepreneurs will be met in various forms/sources.
- Environmental Impact Assessment (EIA) will be made mandatory while processing each development project requiring approval of the Government.
- Immediate framing of detailed Rules on EIA as mandated in section 12 Of BECA
- ‘National Environment Fund’ will be established in order to provide assistance to the victims of environment degradation caused by the natural disasters and anthropogenic activities.
- Formulation of Extended Producers Responsibility (EPR).
- Effective participation of NGOs and CBOs in environmental decision making shall be ensured.
- Strategic Environmental Assessment (SEA) will be institutionalized.
- Careful designing of the environmental protection and management actions to protect and improve women’s access to resources shall be facilitated.
- Raising manpower and infrastructure development of the department in order to fulfil its mandate to a great extent. All divisional and district office will be set-up during this plan period.

- Partnership programme with relevant stakeholder.
- Online submission of environment clearance application will be made available for environmental clearance.
- Facility of data -base and documentation on different environmental subjects and fields will be created to help decision makers, other professional groups, institution to formulate appropriate plan of action to protect environment.

7.4 List of Policies/ Programmes/ Projects for achieving targets of 7th FYP with indicative cost

Table 1.8:

	Goals	Targets	Activities (Policy/ programmes/ projects)	Programme/project wise cost (lakk Tk at 2014-15)
Water Pollution and Industrial Pollution Control				
1.	Industrial Pollution Control.	Assessment of Environmental Pollution from Industrial Sector in Bangladesh.	<ul style="list-style-type: none"> • Promotion of ISO 14000 environment management principles • Preparing a national database on different types of industries operating in Bangladesh including SMEs, in order to identify the industries for monitoring. • Know the waste generation rate as well as pollution load from different industrial sectors and to identify polluting industries as well as their exact locations for monitoring. • Preparing a mitigation plan to reduce environmental pollution in a proactive manner rather than a reactive measure. 	2,310.00
2.	Pollution control from textile industries	Pollution control from textile industries	<ul style="list-style-type: none"> • Installing common effluent treatment plants (CETP) in each textile zones 	Public private partnership
3.	Conservation of Surface Water, Control of River Pollution	Major Rivers of Bangladesh	<ul style="list-style-type: none"> • Bangladesh River Basin Pollution Control Project. 	60,000.00
4.	Sustainable use of ground water resources	Textile and Dyeing Industries	<ul style="list-style-type: none"> • Pilot Project of Recycle and reuse of Textile Effluent 	2,000.00
5.	Improved Environmental Quality	Textile Industries	<ul style="list-style-type: none"> • Introduction of Environmental Management System (EMS) in Textile 	500.00

			Industries	
Waste Management				
6. *	Hazardous Chemical and Waste Management.	Environmentally sound Management and Disposal of PCBs and Medical Wastes.	<ul style="list-style-type: none"> Strengthening of institutional and regulatory framework for PCBs, Improve technical capacities for environmentally sound management of PCB contaminated equipment and waste meeting BAT/BEP requirements. Minimization/Elimination of uncontrolled POPS generation from the healthcare waste. 	2,310.00
7. *	Management and disposal of POPS and other hazardous wastes.	Endorsement for Environmentally sound management and disposal of POPs and other hazardous wastes in the ship.	<ul style="list-style-type: none"> Institutional capacity and advocacy programs. Implementation of Stockholm Convention requirements in all the stages of ship recycling. Sound Management of hazardous waste. Monitoring and Evaluation. 	6,214.00
8. *	Programmatic CDM (Clean Development Mechanism) Development in Bangladesh.	City Corporation & Municipalities (2&3 Phase)	<ul style="list-style-type: none"> Capacity Building & Generation of CDM Benefit through Composting of Organic Waste of Urban Center (City Corporation & Municipalities) in Bangladesh. 	7,100.00
9.	Solid Waste Management	Urban Area	<ul style="list-style-type: none"> Implementation of Waste Reduce Reuse and Recycle (3R) Bangladesh. 	500.00
10.	E-Waste & Hazardous Waste Management.	Electronics products	<ul style="list-style-type: none"> Inventory of E-Waste in large cities of Bangladesh. Develop E- Waste policy. Establish efficient collection system for selected electronic waste Registration of E-waste recyclers. Commitment for technical up gradation of selected registered recyclers for processing E-waste. Assisting registered recyclers to establish Environmental Management System (EMS) and gradually work for ISO-14001 certification. Establish E-waste tracking mechanism in order to update the inventory. Awareness rising. 	332.00
11.	Hazardous waste Management.	Industrial Sludge Discarded Chemicals Waste Water from Ship-Breaking Industries. Infectious	<ul style="list-style-type: none"> Development of Hazardous Waste Management Facility. Establishment of division wise lead recovery and recycling centres/ plants for used out lead acid batteries 	20,000.00

		medical wastes - Lead acid batteries		
12. *	Implementation of Minamata Convention on Mercury.	Mercury Phase out from Bangladesh	<ul style="list-style-type: none"> • Formulation decision making structure for Mercury operation. • Policy and regulatory framework, and institutional and capacity needs in regard to the implementation of convention provisions assessed. • Awareness raised on the environmental and health impacts of Mercury in each of the project countries. • National capacity built to undertake mercury inventories. • National <i>Minamata Convention</i> Initial Assessments (MIA) report available each project country. 	3,000
Air Pollution Control				
13.	Improved Indoor Air Pollution.	Introduction of Improved Cook Stoves in Selected Areas	<ul style="list-style-type: none"> • Develop entrepreneurs who will produce and sell Improved Cook Stoves (ICSs) and provide after sales services, • Install 70,000 ICSs in Selected area of Bangladesh. 	950.00
14.	Sustainable Environmental Initiative in key polluting sectors.	Air, Water and climate pollutant management.	<ul style="list-style-type: none"> • Capacity building for Air, Water and climate pollutant management. • Institutional strengthening. • Standards, Enforcement and Control for emission reduction. • Sustainability of Cleaner initiative. • Communication campaigning. 	60,000.00
15. *	Trans-boundary Air Pollution Control.	Trans-boundary Air Pollutant	<ul style="list-style-type: none"> • Implementation of Male Declaration on Control and Prevention of Capital Dhaka and other Divisional Headquarter. 	100.00
16.	Air Quality Improvement.	Preparation of a Roadmap	<ul style="list-style-type: none"> • Promote Clean Fuel and Vehicle. • Improve fuel quality. 	120.00
Biodiversity Management				
17.	Biodiversity Conservation at Saint Martin's Island.	Biodiversity Conservation and Development of Waste Management of Waste Management System at Saint Martin's Island.	<ul style="list-style-type: none"> • Conservation of other Flora and Fauna of the Island and Associated Area's. • Establishment of Marine Sanctuaries around Charade and Exclusive Marine Protected Area. • Establishment of Turtle Breeding Ground • Develop waste management system. • Development of Eco-Tourism in the Island. 	668.00
18.	ECA River Management.	Management of Ecologically Critical Areas in Four Rivers	<ul style="list-style-type: none"> • To ensure zero discharge of effluent into the rivers, canals, water bodies and paddy fields. • To promote green growth in the 	15,400.00 Separate allocation to be made for

		around Dhaka City. Immediate moratorium on industrial development in Dhaka urban areas.	<p>economy (green industrial growth/greening in the industrial and domestic waste production, greening land-use (also zoning), eco-town, greening of sewage, solid, waste sludge management, greening in the river vessels).</p> <ul style="list-style-type: none"> • To improve the water quality of the rivers around Dhaka city. • To make aware people around the rivers about the adverse effects of solid and liquid waste disposal into the water bodies. • To create a watchdog against polluters-effective monitoring by community. • Determination of bio-indicators • Enhancement of the capacity of sewerage treatment plant(s) of Dhaka city • Installation of separate sewerage plants at Tongi, Gazipur and Narayanganj 	DWASA
19.	Biodiversity Conservation at ECAs Area.	People within and around the ECAs Biodiversity within the ECAs	<ul style="list-style-type: none"> • Biodiversity Resources Management at the declared ECAS. 	6,000.00
20. *	Implementation of National Bio-safety Framework.	Control of unwarranted effects of GMOs on the Biodiversity and Human Health	<ul style="list-style-type: none"> • Implementation of National Bio-safety Framework to address safe handling and use of Genetically Modified Organisms. 	2,000.00
21.	Information and Knowledge-based decision making for Biodiversity Conservation.	Interested Govt. Dept., Academy, NGOs and other agencies.	<ul style="list-style-type: none"> • Development of Countrywide Biodiversity Database using GIS and Remote Sensing. 	5,000.00
22.	Marine Biodiversity Conservation	Coastal line People. Marine Biodiversity.	<ul style="list-style-type: none"> • Declaration and Conservation of Marine Protected Areas in the Face of Climate Change. 	2,000.00
23.	Agro-biodiversity and Medicinal plants Conservation	Agricultural Plant Medicinal Plants	<ul style="list-style-type: none"> • Conservation of Argo-biodiversity and Medicinal plants 	2,000.00
24.	Watershed Management for biodiversity conservation	Different watersheds.	<ul style="list-style-type: none"> • Watershed Management in the upstream of the Main Rivers and hilly areas in Bangladesh. 	50,000.00

25.	Conservation of Coastal and Marine Environment	Coastal belt	<ul style="list-style-type: none"> • Protection of Coastal and Marine Environment from Land Based Activities. 	1,000.00
26.	Reverie Ecosystems Conservation	River System of Bangladesh.	<ul style="list-style-type: none"> • Conservation of Reverie Ecosystems/Habitats of Fisheries and Fishing Grounds in the Face of Climate change. 	48,000.00
27. *	Implementation of Ramsar Convention	Ramsar Sites	<ul style="list-style-type: none"> • Management of Globally significant Wetlands (Ramsar Sites in Bangladesh). 	10,000.00
Land Management				
28.	Mainstreaming Sustainable Land Management (SLM) practice in sector polices	Establishing National Land use and Land Degradation Profile Towards Mainstreaming Sustainable Land Management (SLM) Practice in sector polices	<ul style="list-style-type: none"> • Land use and land degradation profile preparation. • SLM mainstreaming. • SLM Monitoring. 	624.00
29. *	Combating desertification towards sustainable land management.	Development of Baseline scenario regarding desertification and update of NAP	<ul style="list-style-type: none"> • Combating Desertification and Wetland Management 	1,000.00
Environmental Awareness and Campaign				
30.	Awareness rising among School Children.	School Children	<ul style="list-style-type: none"> • Environmental Awareness among School Children Through Green Club Activity 	500.00
31.	Environmental Awareness Building other Program.	Enhance environmental education for sustainable development.	<ul style="list-style-type: none"> • Promoting Sustainable Development through Environmental Education. 	500.00
32.	GIS Based Environmental data based Development	Industries	<ul style="list-style-type: none"> • GIS Based Industrial Survey and Mapping 	200.00
33.	Improve environmental governance and administration in Bangladesh.	DOE's Private Sector and Civil Societies.	<ul style="list-style-type: none"> • Public Private Partnership (PPP) with CBO and Other stockholders. 	1,500.00
34.	Partnership for better environmental management.	DoE, Private Sector and Civil Society	<ul style="list-style-type: none"> • Public Private Partnership (PPP) with CBO and other stake holders. 	1500.00

Institutional Development				
35.	Extension of environmental services of DOE at Division & District level.	Capability Enhancement and institutional Infrastructure Expansion of the Department of Environment.	<ul style="list-style-type: none"> • Construction of DoE's Sylhet and Barisal divisional office and 21 districts building. • Enhance laboratory facility for Sylhet and Barisal divisional office and setting up laboratory facility at 21 districts office of DoE. • Setting up Libarary and Documentation Center (LDC) for Sylhet and Barisal divisional office of DoE as well as for 21 districts. 	50,981.00
36.	Capacity building through research and training.	Establishment of Bangladesh. Environmental Research and Training Institute	<ul style="list-style-type: none"> • Implementation of strategic plan for DOE prepared under SEMP • To establish a State-of Act Environmental Training and Research Institute in Bangladesh. • To recruit and develop human resource for the institute • To establish linkage and network with relevant institutes, universities and agencies within Bangladesh. • To develop sector/stakeholder targeted curriculum and research guideline for the institute. 	30,000.00
37.	Institutional Capacity building of DOE.	DOE's enforcement section, laboratory, legal cell, training cell & planning section.	<ul style="list-style-type: none"> • Training on law and enforcement; laboratory management and analysis; HRD • Capacity building of DoE Laboratory • Setup a National Documentation Center with knowledge and data hub . 	2,500.00
Ozone Layer Protection				
38. *	Implementatio n of Montreal Protocol	Implementation HCFC Phase-out Management Plan (HPMP)- UNEP Component	<ul style="list-style-type: none"> • To build capacity in RAC service technicians • To review policy and regulation for the implementation of HPMP • To build capacity of law enforcement and customs officers • To create awareness among the stakeholders and mass people. 	294.00
39. *	Implementatio n of Montreal Protocol	Renewal of the Institutional Strengthening for the Phase-out of ODS	<ul style="list-style-type: none"> • Imposition of control on import and uses of ODS; • Monitoring of ODS uses; • Disseminate information on alternatives to ODS to the users 	122.00

		(Phase-VII).	<ul style="list-style-type: none"> • Project preparation and to assist implementation. • Update inventory on ODS imports and uses; • Data reporting to the ozone secretariat and other relevant agencies; • Observance of International Ozone day every year and raise awareness. 	
40. *	Implementatio n of Montreal Protocol.	Conversion from HFC-134a to isobutene as refrigerant in manufacturing refrigeration equipment at Walton Hi-Tech Industries Limited, Bangladesh.	<ul style="list-style-type: none"> • Design changes/modifications of refrigerators for use with isobutene including energy efficient operations. • Installation of R600A supply system • Installation of charging stations for R600a sized for filling domestic refrigerators • Installation of Safety control system and ventilation, including repair area • Installation of ultra sonic welding device for closing the charging pipe • Installation of explosion protected vacuum pumps • Training • Prototyping, reliability test & trials for product 	663.00
41. *	Implementatio n of Montreal Protocol	Climate and Energy benefits form HCFC Phase out Management Plan (HPMP) in Bangladesh.	<ul style="list-style-type: none"> • Strengthening of Standards and Labeling Programme (SLP) • Framework for Efficient and Low HCFC Economic development (FELHED) • Enhanced Awareness and Outreach and Capacity building 	827.00

Note: MEA implementation project proposals are earmarked in asterisks (*).

8. REVIEW ANALYSIS OF 6TH FYP, SETTING THE TARGETS AND DEVISING THE STRATEGY AND RECOMMENDATION FOR 7TH FYP ON FORESTRY SECTOR

8.1 Review analysis on 6th FYP

The main objectives of the Sixth Five Year Plan were to expand forest resources, make forests productive, develop institutional capacities, and to encourage peoples' participation. There was also a vision to achieve 20 percent forest coverage by the end of 2015 as expected in the Twenty Years Master Plan (1995-2015) prepared for Forestry Sub sector. In line with the above objectives, plantation target of 50,000 hectares was fixed for the plan period.

Accordingly many development projects were undertaken with the financial assistance from development partners, Bangladesh Climate Change Trust Fund (BCCTF), Bangladesh Climate Change Resilient Fund (BCCRF) as well as government's own resources. Against the set target about 57,186 hectares of plantations were raised in last 4(four) years and additional 8,628 hectares will be raised during current financial year which will make only 21.80% achievement.

Due to prevailing disfavoured law and order situation in Chittagong Hill Tracts (CHTs) and non-cooperation of CHT Regional Council, no plantation could be raised there. Besides this, non-availability of suitable newly accreted lands in coastal areas and delay in approval process of development projects caused impediments to achieve plantation target.

Moratorium on felling trees in natural forests has positive impacts on conservation of Biodiversity. This should also be continued for another 20 years.

The ever-increasing population of Bangladesh is imparting pressure on existing government managed forest resources resulted to its over exploitation. As such marginal land utilization through peoples' participation for forestry development have been launched in early eighties and continued till the last five year plan. During the last 6th FYP, all plantation programmes were implemented under participatory approach involving surrounding forest dependent communities. The success of participatory forest management in Modhupur Forests of Tangail district got appreciation from different authorities and got 'HSBC-Star Climate' award in 2012. Such programmes have already established an indication of future increase of forest cover throughout the country. The fact is that wide-spread destruction, clearing of forest land for agriculture, encroachment and illegal settlement etc. have been pragmatic scenario of this country that undermined the success of achieving 20 percent forest coverage by the end of 2015.

During the Sixth Five Year Plan coastal afforestation in newly accreted chars in the coastal areas was given due emphasis and about 24,646 hectares plantations were raised during last four years and another 3,420 ha. will be raised in this year. Green belt, though not contiguous, was established in the coastal zone to serve as shelterbelt against cyclone and tidal surge. The scope of coastal afforestation will be increased in future as a result of re-fixing of maritime boundary of the country. Raising plantation along the side of the roads and embankments was continued to

establish 500 meter wide permanent green belt along the coast. During plan period about 13,864 km. strip plantations were raised and 53 million seedlings were distributed for homestead planting.

Necessary interventions were undertaken to conserve biodiversity of the Sundarban Mangrove Forests. Extraction of all types of trees was stopped after cyclone Sidre and proposal for total stop of harvesting forest resources in Sundarban Mangrove Forests is now under active consideration of the authorities. To protect Royal Bengal Tiger, the main flagship wildlife species of Bangladesh, Tiger Action Plan is prepared for 2009-2017 period and accordingly different conservation activities have been implemented. During the last plan period efforts were made to strengthen capabilities of Forest Department by imparting training to officials and staffs on wildlife conservation, construction of smart green infrastructures in the forests and providing necessary logistics. National Tiger Recovery Programme is now under implementation. Global Tiger Initiative(GTI) and Government of Bangladesh launched a regional project for wildlife conservation for the first time in this region of the world, in which Nepal and Bhutan are also involved. The World Bank has given \$36 million soft loan for the project titled 'Strengthening Regional Co-operation for Wildlife Protection started in July, 2011.

Reed lands of Sylhet region are mostly remained unattended caused serious depletion due to conflicting land tenure system resulting lack of clear boundary demarcation.

Adequate emphasis was given during the past plan period to the effective biodiversity conservation in the country. Accordingly initiatives have been taken to establish wildlife division and national park, botanical garden and eco-park in selected areas. In consonance with biodiversity conservation, 3 Wildlife and Nature Conservation Divisions, 2 National parks, 7 Wildlife Sanctuaries and 1 Botanical Garden have been established in the last plan period. The Protected Area (P A) coverage is increased to 10.72% from 10% of the total forest area of the country. Due to non-availability of suitable land in northern and southern region Regional Botanical Garden could not be established.

Social Forestry program has got momentum in the last few years. About 500,000 poor people is involved in Social Forestry Programme. More than Taka 2,080 million is distributed among 105,633 beneficiaries.

Among the non-wood forest resources 2,940 ha. bamboo 2,667 ha. cane, 1,050 ha. murta and 850 ha. golpata plantation have been raised during the last plan period.

8.2 Objectives and targets for 7th FYP

The development vision of the forestry sub-sector is to expand forest resources of the country for maintaining ecological balance and sustainable economic growth.

In Forestry Sector Master Plan (1995-2015) a target was fixed to achieve 20 percent forest coverage by the end of 2015. But now it is clear that it is not achievable at all because in a land scarce country like Bangladesh there is hardly any scope to spare additional lands for forestry except newly accreted chars in the Bay of Bengal. Still it is encouraging that the tree coverage of the country has substantially increased to 19.2% with ~10% tree density. During the next plan period emphasis will be given to increase tree density ~50% by improving stand quality through

different management interventions.

At present forestry sub-sector is getting more importance government policy and strategy. Budgetary allocation has increased to accomplish new forestry programmes, More avenues are opened such as 'Bangladesh Climate Change Trust Fund and 'Bangladesh Climate Change Resilient Fund' to support forestry sub-sector in climate change perspectives. Development partners have also come forward with different programmes supplementing climate change adaptation and mitigation, co-management of forests, participatory afforestation, livelihood support for forest dependent communities, wildlife conservation and protection activities. In this scenario development initiatives will be taken with following objectives:

- Conserve and protect forest ecosystems for biodiversity and overall environmental stability;
- Implement forestry development programmes with due emphasis on climate change adaptation and mitigation;
- Programmes for forest conservation along with people's welfare to be taken under Clean Development Mechanism and REDD+ initiatives.
- Continue and expand people oriented afforestation programme for poverty alleviation and increased employment opportunity for forest dependent community including women;
- Strengthen and expand co-management system in all Protected Areas(P As) to achieve meaningful participation of local people through CBO, local government bodies and government agencies in forest conservation;
- Protection of wildlife and control illegal trade of wildlife and trophies;
- Institutional and human resources development;
- Watershed management and soil conservation;
- Valuation of eco-system services so that appropriate contribution of forestry sector is estimated in GDP calculation;
- Promote multiple land use technology to ensure increased productivity and supplement agricultural production;
- Encourage private plantation of rubber, orange and non-traditional fruits like chalta, olive, wood apple, casheonut, amloki, horitaki, bohera, lotkon etc. and other high-value trees;
- Expand facilities for ceo-tourism and recreation.

8.3 Strategies and Policies for 7th FYP

In line with the objectives mentioned above the following strategies and policies for the forestry sub-sector during the 7th Five Year Plan will be as follows:

Moratorium on felling in the natural forests will continue. Existing natural forests, denuded hills

and scattered tree forests will be divided into 'core zone' and 'buffer zone' and assisted natural regeneration will be initiated to improve and conserve biodiversity in the core zone. The productivity of the buffer zone will be enhanced for meeting local demand of forest produce. Scientific management principles will be strictly followed to restore productivity of these lands.

- Necessary programmes will be taken to improve quality and increase tree density of the existing forests and older plantations through 'enrichment planting' and 'assisted natural regeneration'.
- Plantation activities in coastal zone will be intensified with the aim of strengthening adaptation and mitigation initiatives against climate change impacts. Due attention will be given for selecting suitable plant species.
- An estimated 50,000 ha. land of hill forest and 5,000 ha. of plain land forest will be planted during the plan period. Productivity of plantations will have to be increased manifold. Multi-purpose trees will receive special attention to increase the productivity of land under forest.
- People's participation will be continued in all buffer zone of forests. Integration of tree plantation and crop cultivation will be practiced. Programme to rehabilitate the degraded Sal Forests will be taken up as part of important development activities.
- The existing coastal afforestation and enrichment plantation will also be continued. The existing mature coastal plantations will remain for reinforcing green belt. An area of 30,000 ha. will be planted and replanted in the coastal areas.
- Due importance will be given to the Sundarbans Mangrove Forest for its biodiversity conservation. Different measures will be taken to conserve and protect wildlife with special attention to Royal Bengal Tiger. The activities of 'Emergency Tiger Response Team and Village Tiger Response Team(VTRT), constituted with the local peoples of surrounding villages will be continued for relaying stray tigers.
- To prevent the extent of damage by cyclones and tidal surges, creation of 500 meter wide permanent Coastal Green Belt along the coast will be continued and remaining vacant spaces will be brought under tree cover. Moreover, seedling will be raised to sale in subsidized rate for the coastal zone to facilitate homestead and private plantation.
- The Reed lands of Sylhet region has long been lying unutilized. Under the 7th Five Year Plan 5000 ha. of Reed lands will be planted. The clear-cut demarcation of Reed land is prerequisite for effective management of this fresh water swamp forest.
- Agor oil, a valuable export item especially in Middle East countries, produced from *Agor* (*Aquilaria agalocha*), a native tree species, has been grown commercially in private sector for long time in Borolekha upazilla of Moulavibazar district and earning foreign exchange by exporting it produced in crude method. The export earning can easily be increased by improving extraction technology for producing refined oil. It has a great potential for establishment of export oriented industry. Forest Department already raised 9000 ha. agor plantation in the forest which will be expanded during the plan period. Another 5000 ha. plantations will be raised during the plan period.
- Social forestry has now become a social movement in Bangladesh. Social forestry

programme will continue for expansion and strengthening of upazilla nurseries, union level nurseries, expansion and strengthening of forest extension and nursery training centers. An estimated 20,000 km. of strip plantations will be raised during the plan period. Local government bodies will co-ordinate the afforestation programme at the grass root level under this programme. During the th Plan, NOOs will be more directly involved in afforestation programme. They will motivate people through informal training and other extension services and will assist Forest Department to implement such programme.

- Past record indicates that wood energy contributes 13 percent of the total fuel consumption of the country. Wood fuel is the most important form of energy for domestic use in rural areas. In Bangladesh, domestic cooking consumes 65 percent of fuel wood and the rest 35 percent is consumed by the industrial and commercial sectors. For the prevailing demand through social forestry, short/medium rotation fast growing tree species have to be planted along the roads and embankments, and on marginal and fellow lands with active participation of local people.
- Non-wood forest products have substantial potentials for economic benefit. Bamboo, cane, murta, medicinal plants, honey, wax, golpata, etc. will be developed during the 7th Five Year Plan in a systematic way. The 7th Five Year Plan targets to develop 5000 ha. of Bamboo, cane and murta plantation. Honey, wax and golpata will also receive special attention for improvement during the plan period.
- Emphasis will be given for forest land survey and updating the land record. Initiative has been made through formulating project which is expected to be implemented during the th Five Year Plan. Forest areas will be demarcated to avoid unlawful encroachments.
- The protected area (P A) coverage will be increased to 15 percent of the total forest land during the r: Five Year Plan period. Carbon stock will be measured in all potential PAs and programmes for forest conservation along with people's welfare to be taken under Clean Development Mechanism and REDD+ initiatives.
- Programmes will be taken to protect the threatened and endangered species of flora and fauna and the fragile ecosystems.
- Watershed management, wetland conservation etc. will be initiated in the new area and also will be intensified in the old area for better conservation of nature in the country during the plan period.
- Effective participation of NGOs/ CBOs shall be ensured in the decision making process of co-management.

8.4 List of policies/ programmes/ projects for achieving targets of 7th FYP with indicative costs

Table 1.9:

Sl. No.	Goals	Targets	Activities (policy/program/project)	Programm wise (Iakh Tk. prices)
1	2	3	4	5
1.	To bring 20% of the country's land under tree cover with density ~ 50% by the end of 2020.	New plantation- hectare. Rehabilitation of forests and older plantations- 55,000 hectare Homestead & planting- 55	Hill forest- 50,000 ha. Plain land forest- 5,000 ha. Reed land- 5,000 ha. Sal forest rehabilitation- 5,000 ha. Enrichment plantation- 20,000 ha. Assisted natural regeneration- 30,000 ha. Agor plantation- 2,000 ha. Bamboo, cane and murta plantation-2,000 ha Strip plantation- 20,000 km. Homestead/institutional planting- 5 million Seedling for sale- 50 million	44374.40 4364.20 3380.00 350.00 9348.00 14310.00 540.00 1080 .. 00 48936.00 2250.00 5000.00
2.	To conserve eco-systems for biodiversity improvement.	Rehabilitation of forests and older plantations in PAs- 55,000 hectare	Re-planting- 5,000 ha. Enrichment planting- 5,000 ha. Assisted natural regeneration- 10,000 ha.	4547.30 2337.00 4770.00
		Strengthening co-management Nos.	No. of PAs- 25 Nos. Expansion of eco-tourism facilities- L.S.	125.00 100.00
		Wildlife L.S.	Protection and management of wildlife- L.S.	45000.00
3.	To mitigate climate change impacts and increase adaptive capability.	Afforestation in area- 30,000 ha.	Mangrove plantation-30,000 ha. Enrichment planting- 1,000 ha. Golpata plantation- 1,000 km.	13518.00 467.40 597.60
		Coastal Green Belt- 5,000 seedling km.	Plantation along Road/embankment sides- Homestead/institutional planting- 5,000 seedling km Seedling sale- 10 million	12234.00 1000.00
		Carbon sequestration	Assessment of carbon stock- 10 PAs.	1000.00
		Climate change adaptation & L.S.	Climate change adaptation & mitigation activities- L.S.	10000.00

4.	To improve socio-economic condition of forest dependent communities.	Social forestry and participatory afforestation & re-forestation	Hill forest-'30,000 ha. Plain land forest- 3,000 ha. Sal forest rehabilitation- 3,000 ha. Agor plantation- 2,000 ha. Bamboo, cane and murta plantation-2,000 ha. Strip plantation- 20,000 km.	(included in goal- 1)
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9. Concluding Remarks

The implementation of the seventh five year plan will occur in a regime of post 2015, Sustainable Development Goal context. The challenge before Bangladesh as it strives towards middle income country status will be managing the pressures placed on the environment and natural resources in the context of rapid urbanisation, industrialisation and continued population growth. The environment and natural resources management strategy for the upcoming years build on existing initiatives but people's centered paradigm is envisioned to make a difference to support sustainable economic productivity and social wellbeing.

To ingrain environmental protection within the national psyche a cultural shift or paradigm shift must take place. A healthy natural environment must be seen as an essential tool for economic development, future prosperity and wellbeing and resilience. This shift requires broad based citizen engagement, as environmental protection is everyone's' responsibility, from the farmer, to the industry executive, from the waste collector to the senior government official. To achieve this, we need to create an enabling environment that allows all people to participate in decision making processes around the protection and management of the natural environment.

Environmental issues are felt locally, and as such decisions about their management should also occur at that level. A decentralisation of the management structures would empower communities to take ownership over their local environment, and assist them in protecting it. Establishing legal and management institutions which involve industry, government, community and NGO engagement, will enable stronger decision making, and deliver improved environmental, social, and economic outcomes across the country. Checks and balances in regulations and implementation will deliver greater transparency and accountability through the process. Exploring innovations in monitoring and policing these regulations, like crowdsourcing, may assist to overcoming budgetary limitations, and reduce violations, promoting the community as stewards for environmental protection.

Like many complex challenges, a whole of government approach is required for managing the environment. It is not only the responsibility of the DoE, but all ministries and agencies, including planning, public health, education, finance, disaster, water, transportation, waste management, city corporations etc. It is only by working closely together can the benefits of environmental protection be fully realised for all. Strengthening the financial and regulatory instruments will also assist to engage the private sector in this process. There are many tools that can be used to leverage the input of the private sector including, fines, incentives, taxes, low cost loans, international standards, voluntary codes, awards, removal of licences and banning continued violators and all of these should be thoroughly examined to maximize the positive contribution of the private sector.

Adopting the recommended initiatives will enable the Government to successfully realise its commitment to Vision 2021 of a greener, cleaner, healthier and wealthier Bangladesh.

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