2014

Present Status and Impact of Environmental Laws on Biodiversity Conservation in Bangladesh

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PRESENT STATUS AND IMPACT OF ENVIRONMENTAL LAWS ON BIODIVERSITY CONSERVATION IN BANGLADESH

PhD Dissertation

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A Dissertation

Submitted to the Institute of Environmental Science (IES), University of Rajshahi
in Partial Fulfilment of the Requirements for the Degree of

Doctor of Philosophy
in
Environmental Science

Institute of Environmental Science (IES)
University of Rajshahi
Rajshahi, Bangladesh

April 2014

DEDICATED

TO MY RESPECTED FATHER
AL-HAJ MD. HABIBOR RAHMAN, JANNATBASINI
LATE MOTHER HASINA BEGUME
AND
LATE WIFE SYEDA TANZILA AFRUZ

DECLARATION

I do hereby declare that the work submitted to the Institute of Environmental Science, University of Rajshahi for the Degree of Doctor of Philosophy entitled **"Present Status and Impact of Environmental Laws on Biodiversity Conservation in Bangladesh"** is the result of my own investigation carried out under the supervision of Professor Dr. Mohammad Abdul Hannan, Department of Law, University of Rajshahi, and Dr. Md. Redwanur Rahman, Associate Professor, Institute of Environmental Science, University of Rajshahi, Bangladesh. The thesis or part thereof not been submitted to other University or Institution for any other degree or diploma. To the best of my knowledge and belief, it contains no material previously published or written by any other person, except when due reference is made in the text.

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CERTIFICATE

This is to certify that the thesis entitled **"Present Status and Impact of Environmental Laws on Biodiversity Conservation in Bangladesh"** submitted by Mr. Md. Helal Uddin, Session: 2005-2006, ID no.: 05106 for the award of the Degree of Doctor of Philosophy in Environmental Science, University of Rajshahi, is based on the results of his own research work carried out in the Institute of Environmental Science under our supervision and guidance.

The manuscript of the thesis has been scrutinized and carefully checked by us. It is an independent and original work to the best of our knowledge, this thesis was not previously submitted for any Diploma, Degree or Fellowship to any other University or Institute except due references whenever needed.

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ACKNOWLEDGEMENT

All the admiration to almighty Allah the most graceful, kind and beneficent who has helped, enlightened and enabled me to submit this thesis.

I am extremely pleased to express my indebtedness and profound sense of gratitude to my reverend principal supervisor Professor Dr. Mohammad Abdul Hannan, Department of Law, University of Rajshahi, and Co-supervisor Dr. Md. Redwanur Rahman, Associate Professor, Institute of Environmental Science, University of Rajshahi for their scholarly and painstaking supervision inspirational support, untiring guidance and sympathetic co-operation at all stages of my research, without which the study could not have been possible.

I would like to acknowledge my indebtedness to the Institute of Environmental Science (IES), University of Rajshahi for offering me all kinds of academic supports and facilities for this research work. I am grateful to my teacher Professor Dr. Md. Azizul Islam, Director Institute of Environmental Science (IES), Ex-Director, Professor Dr. Md. Sarwar Jahan and all teachers of IES for their valuable suggestion during my research work. Besides Mr. Md. Sultal Ali, Secretary, IES along with all others staffs have helped me much at IES.

I am extremely obliged to express my heartfelt indebtedness to my reverend teacher Professor Md. Safinur Rahman, Ex-Chairman Departmental of Zoology, University of Rajshahi for providing me, constant encouragement and valuable suggestions all through my research work.

I express thanks to Dr. Md. Golam Mostofa, Dr. Md. Shahab Udddin, Dr. Md. Abu Tawab, Dr. Md. Beniaz Zaman, Ex-PhD Fellow, Institute of Environmental Science for their constant help and inspiration during the study period.

My special thanks due to Mr. Md. Saifur Rahman, Ex-Director General, Atomic Energy Commission, Dr. Md. Rafiqul Islam, Mr. Md. Omar Faruque Khan Zubayer, Mr. Md. Mahfujur Rahman, Mr. Md. Mizanur Rahman and Md. Ziaur Rahman for their occasional help.

I express my grateful thanks to different categories of interviewer those who have helped my cordially during the investigation period.

I add my wish to acknowledge the help of all who directly and indirectly came to assist me during the course of investigation and compilation of the thesis.

Finally, heartiest thanks are due to my respected Father, Alhaj Md. Habibor Rahman, Mother, Mrs. Hosneara Begum, Uncle Mowlana Noor Muhammad, Wife Mrs. Laily Begum, All Brothers and Sisters and others family member for their endless sacrifice and blessing that inspired me always.

Lastly, I convey my gratefulness from the core of my heart to beloved son Md. Tanvir Mahtab Siam and Md. Safwan Abrar because they deprived from my affectionate love with a view to my research works.

Last, but not least I express Dowa (Pray) to my Late Wife Syeda Tanzila Afruz, she loved me very much and endless sacrifice during my research period.

Md. Helal Uddin

LIST OF ABBREVIATION

BAPA	Bangladesh Poribesh Andolon
BELA	Bangladesh Environmental Lawyers Association
BFLLFEA	Bangladesh Finished Leather, Leather Goods and Footwear..
BSCIC	Bangladesh Small and Cottage Industries Corporation
CBD	Convention on Biological Diversity
CBFM	Community Based Fishery Management Programme
CCF	Chief Conservator of Forest
CDM	Clean Development Mechanism
CFC	Chloro Fluoro Carbons
CHT	Chittagong Hill Tracts
CSIR	Council of Scientific and Industrial Research
DCs	Developed Countries
DNA	De-Oxyribo Nucleic Acid
DOE	Department of Environment
DOF	Department of Fisheries
DST	Department of Science and Technology
ECA	Ecological Critical Area
ECR	Environmental Conservation Rules
EIA	Environmental Impact Assessment
ENVIS	Environmental Information System
FD	Forest Department
GEF	Global Environment Facility

GHG	Greenhouse Gases
GMO	Genetically Modified Organism
GO	Government Order
HYV	High Yield Varities
ICIMOD	International Centre for Integrated Mountain Development
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
IPNS	Integrated Plant Nutrient System
IRRI	International Rice Research Institute
ISAAA	International Service For The Acquisition of Agri-Biotech Application
IUCN	International Union for Conservation of Nature
JATI	Judicial Administration Training Institute
LGRDC	Ministry of Local Government Rural Development and Cooperatives
LMO	Living Modified Organisms
MoEF	Ministry of Environment and Forest
NCS	National Conservation Strategy
NEC	National Environment Council
NEC	National Exhibition Centre
NEP	National Environment Policy
NES	National Environment Secretariat
NGO	Non-Government Organization
NRMS	Natural Resources Management System
ODS	Ozone Depleting Substances
PEPO	Pakistan Environmental Protection Ordinance
POPs	Persistant Organic Pollutants
RAJUK	Rajdhani Unnayan Kartipakkhya

RONAST	Royal Nepal Academy of Science and Technology
RSPN	Rural Support Programmers Network
SAFTA	South Asian Free Trade Area
SRDI	Soil Resources Development Institute
TMSS	Thenga Mara Mohila Sabuj Sangha
UNCED	United Nations Conference on Environment and Development
UNDP	United Nation Environmental Development Program
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention and Climate Change
WEMC	World Conservation Monitoring Centre
WHO	World Health Organization
WTO	World Trade Organization

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SUMMARY

From the discussion stated in my study it is found that the environment is an important external conditions in which an organism lives and we never thinks our life without it. In the view of Baul environment is the treasure, which supports life. It is healthy environment which can make our life healthy. Though the importance and role of environment in human life is very strong nevertheless we could not ensure healthy and safety environment for us.

In my study, I have tried to show the biological resources and diversity form on the basis of both the ecology and economy of Bangladesh. Most essential sectors related to human life are heavily dependent, directly or indirectly on these biological resources. In my understanding, it is found from the researches done by many famous biologists that the world biodiversity may be divided into three. These are species diversity, genetic diversity and ecosystem diversity.

Bangladesh is a tropical country of 147,570 sq.km which was environmentally rich than other parts of the earth even in early 1960s. It has a long seacoast, numerous rivers and their tributaries, deep and flood plain wetlands, lakes, haors, baors, evergreen forests of tropical nature, semi evergreen forest, hill forests, moist deciduous, forest, swamps *etc*.

But today, Forests and other vegetation in have lost their original characteristics and ecological features due population growth and forestland converted to agriculture to meeting up the food shortage. With mild temperature, tropical climate, fertile soil, ample water, abundance of fish, rich ecology and biodiversity and forests, various flora and fauna, unfortunately, this rich environment is degraded due to various causes such as population growth, human interventions, indiscriminate use of environmental resources, unplanned urbanization and infrastructure development, industrialization, poverty, food shortage, introducing modern agriculture technology and so on.

Presently Bangladesh has been suffering from various environmental problems such as various pollution, urban solid waste disposal, deforestation, bio-diversity degradation,

ecological imbalance, climate changes, land degradation, wetland degradation, water scarcity and other environmental resources degradation *etc*.

Pollution affects us from the different grounds such as polluting the air which is an integral part of our life, polluting the water without which we can not imagine our life, polluting the noise due to the hydraulic horns, band transport vehicles, loud speakers *etc*.

These shorts of disasters are happening by land degradation, wet land and water resources degradation, deforestation etc. Human beings are mostly contributed behind this disasters for rapid pollution growth, Chittagong Hill cutting, absence of a proper land use policy *etc*.

Identifying the causes of biodiversity depletion is a great achievement of my study. The Sundarban is the largest compact mangrove forest of the world. It is called “Beautiful Jungle” in another word. It was rich with different species of animal. In 2000, almost 666750 animals of different species were found. But today this number of animals in Sundarban is decreased dramatically.

Chalan beel is another source of biodiversity which is called heaven of fish. Almost 30,000 fishermen hunt fish in rainy season and 12,255 metric tons different kinds of fishes were caught by them in a year. The availability of the agricultural and fishing land of Chalan beel and the surrounding is decreasing day by day due to increased demands of settlement.

Initiatives taken in Bangladesh are as formulating and updating laws and policies, implementing various projects to mitigate the present environmental problems, formulating some long term environmental action plans, ratifying different international and regional treaties. In recent years, Government has enacted some important environmental laws such as the Environment Conservation Act, 1995, Environment Court Act, 2000, formulated Environment Rules 1997, Environment Policy 1992, Environmental Action Plan 1992 conseruation of Wildlife Act, 2012, Bio-safety Rules, 2012, Paly Grounds and Natural Water Bodies in Twon and Municipal Areas Act, 2000 and some other important rules and policies are under consideration for enacting. But besides these initiatives losing biodiversity is going on till to day.

Violations of the laws are now a common practice to the people. Due to the increasing demand of daily amenities, the people have been more opportunistic to abuse environment for their own benefits.

In my study, I have shown the connectivity of both people and organization with the violation of laws. Some powerful organization plays their aggressive role and violates the environmental laws for which the biodiversity of Bangladesh is going down day by day to be destroyed. In 1994, a writ petition was first taken before the high court divisions on behalf of the local people where a disputed development action was being implemented. The petition was at first rejected by the court on the ground of standing of the organization. A few numbers of conscious persons, responsible organizations, rightists and victims tried to take litigation against the violators of the environmental laws in the different times from their grounds. But ultimately they could not be succeeding with their efforts. For these intellectual disabilities our biodiversity is in loss till today.

So, it is said that the complexities to the enforcement of the laws are making inspiration to the violation of the conceded laws.

If the necessary laws are possible to be implemented effectively to the affected grounds then a gradually development will have in favor of our biodiversity. According to my field experience completed as a part of my thesis, it is found that the caretaker government (Oct'06-Oct'08) played vital role during their period. From the view of the locals of Meghnaghat of Chadpur we are informed that the amount of harvested hilsha fish has been increased wonderfully in 2008 and 2009 because of having effective implementation of the relevant laws during the period of last caretaker government.

Brick fields are the most pollutant industry in the country which impacts our environment highly by destroying forest/trees and producing Carbon Di-Oxides (CO_2). A few years ago this sectors was a great concern to our environmentalists but today this sector has been developed environmentally by enacting the laws in which coal is suggested as fuel to burn the raw bricks.

As like these mentioned sectors there are so many sectors damaging our environment in which we should implement the necessary laws effectively.

Environmental law began in the Indian subcontinent with the enactment of Land Mark Public Health Act, 1875 by the British ruler. There are around 57 laws enacted by the British rulers though these were not treated as environmental laws by the jurists and scholars till 1960 because environmental problems originated after 1960 when it became threat to global

civilization. In reality, scholars put the environmental problems to thoughts in 1960 but these were treated as acute in 1970. For the despoiled situation of environment, the government in different periods passed and enacted laws to reduce environmental problems.

After the independence, Bangladesh government has realized the environmental problems and adopted necessary measures with a view to developing and conserving the environment and environmental resources. Environmental consideration got priorities in every development sector to ensure sound environment and sustainability. At present, there are around 200 environmental laws in Bangladesh and all of them are in execution in different sectors. According to the imposing period, these laws are divided into three periods such as British, Pakistani and Bangladesh period. There are around 58 laws enacted by British rulers (1757-1947), around 40 and 90 laws enacted in Pakistan and Bangladesh government respectively. The Government of Bangladesh has enacted major laws and policies to have the environmental solutions after 1990.

Agriculture is one of the largest environmental activities through the world including Bangladesh. It has a vast role in the development of Bangladesh economy. Laws and policies to control the agricultural activities in Bangladesh have been passed at several times. There are 10 agricultural laws passed by the British rulers and the major of them are The Canal Act, 1864, Irrigation Act, 1876, Destructive Insects and Pests Act, 1914 etc. There are around 9 laws enacted in Pakistan period and the major of them are Non Agricultural Tenancy Act, 1949, State Acquisition and Tenancy Act,1950, Agriculture Pests Ordinance, 1962 etc. And the government of Bangladesh passed many agricultural laws after the independence such as Agricultural Pesticides Ordinance, 1971, Bangladesh Agricultural Research Institute Ordinance, 1976, Bangladesh Agricultural Research Council Act, 1996 *etc*.

Wetland and fish are one of the valuable and integral components of our environment and the main protein source of our country from the very beginning of the human civilization. To regulate and develop this fish and fish resources there are twelve fisheries laws passed in the different periods. Of them two laws are passed in British period, three laws are passed in Pakistan period and remaining seven laws are passed in Bangladesh period.

Development of wildlife conservation laws are passed to conserve and develop wildlife and domestic animals, prevention of cruelty to animals, restriction on hunting and slaughters, control of consumption of meat, create wildlife sanctuary, livestock disease and treatments. These laws are passed in different periods. Of them three laws are passed in British period, four laws are passed in Pakistan period remaining five laws are passed in Bangladesh period.

There are six Acts and three ordinances have passed for the conservation and development of the forest and forest resources, wildlife, *etc*.

Water Pollution and Water Resources Management - There are seven Acts, one Ordinance, two Rules, and one Order for conserving and maintaining watersheds, controlling and regulating water pollution, sustainable planning and use of water resources, conservation of aquatic biodiversity *etc*.

To save the global environment and biodiversity different types of efforts were taken in different times. At first the relationship between economic development and environmental degradation was placed on the international agenda in 1972, at the UN Conference on the Human Environment, held in Stockholm. In 1992, The Earth Summit was held in Re De Janeiro of Brazil in which a number of agreement were signed and many steps were taken for having a change of our traditional development in environmental sectors.

There are quite a few examples where environmental issues have successfully been addressed. Bangladesh has been able to create an enabling policy regime for better management of environment and natural resources. The policies has adopted in principle the concept of sustainable development and recognized the importance of economic development that goes in hand with the control of environmental pollution and maintaining ecological balance. An enabling legal environment has been tried to create by establishing Environment Court, enacting Environmental conservation Act and Rule, making EIA mandatory for all development activities etc. But for the lack of inter-sectorial coordination, conflicts in sectorial policies, lack of institutional capacities, regulatory and institutional inadequacies, abuse of laws by the authority and out dated laws expected developments in are so far.

Chapter 1
Introduction to Biodiversity Conservation

1.1 Definition of Environment

Many scholars of the world put to thoughts on environment. It may be clarified and briefly discussed with the statement of Albert Einstein that the "Environment is everything that isn't me" (Ball and Bell, 2001).

Environment is a general term that refers to “the external conditions in which an organism lives”. The word environment comes from the French word "environ" means “around” or “round about”, ‘to surround” “to encompass”. To define environment is not an easy task. In fact, environment is an integral part of human life. In brief, it is defined as the surroundings of inhabitation and economic activities of the people. Broadly, it is composed of three different components such as natural, techno sphere and social environment. It refers to the "sum total of conditions which surround man at a given point in space and time." The World Commission on Environment and Development known as Brundtland Commission defined Environment as "where we all live". Its normal meaning relates to surrounding's but obviously it is a concept that is relative to whatever object it is which is surrounded.

Environment, says the Oxford English Dictionary, means” the objects or the region surrounding anything;”or the conditions under which any person or thing lives or is developed. Some times environment is presented in a more restricted sense for the external conditions of life of humans and other living organisms. External, that is, to each species, for any one species, other species are part of the environment (Kafiluddin, 2001).

According to *Baul views* environment is the treasure, which supports life. On the other hand, Environment can be distinguished as: 1) the combination of physical conditions that affect and influence the growth and develop of an individual or community, 2) the social, cultural, and economic conditions that affect the nature of an individual or community and 3) the surrounding of an inanimate object of intrinsic social value (Bashar, 2004).

Environment has appeared in Bengali vernacular tradition mostly as prakriti and poribesh. Both connote nature while prakriti is objective or physical aspects of nature and poribesh is subjective or aesthetic aspects of nature. Pepper puts it as real and perceived environments. The Holly Quran reflects on the environment as (a) verily, all things have We (Allah) created in proportion and measure (Holly Quran 54: 49) and (b) We created not the heavens, the Earth, and all between them but for just ends, and for the term appointed. But those who reject Faith turn away from that whereof they are warned (Holly Quran 46:3) According to the New Encyclopedia Britannica, (1943-1973), in biology, the entire range of external influences acting on an organism, both the physical and biological, other organisms forces of nature surrounding an individual are included in the environment.

Banglapedia states that the aggregate of conditions of the existence or development of life and nature. According to Environment Conservation Act, 1995-the inter-relationship existing between physical properties of earth (water, air, and soil) and living organisms (human beings, plants, and microorganisms) defines as environment.

According to Britannica (1993) the environment includes air, soil, water, climate, food supply and various other external conditions. Environment is defined as the complex of physical, chemical and biotic factor that act upon an organism or an ecological community and ultimately determine its form and survival.

1.2 Present Situation of Environment in Bangladesh

Bangladesh is a tropical country of 147,570sqkm located in Southern Asia and it was environmentally rich even in early 1960s. As subtropical geography it had variety of Biodiversity and rich ecology (http: Banglapedia, search.com.bd/ht/foo44.htm.), monsoon climate characterized by heavy seasonal rainfall, moderately warm temperature and high humidity.

Accordingly, there are some natural calamities such as floods, tropical cyclones, tornadoes, and tidal bores affect the country almost every year (*http: Banglapedia, search.com.bd/ht/foo44.htm.*).

It has a long seacoast, numerous rivers and their tributaries, deep and flood plain wetlands, lakes, haors, baors, evergreen forests of tropical nature, semi evergreen forest, hill forests, moist deciduous, forest, swamps *etc*. Forests and other vegetation have lost

their original characteristics and ecological features due to population growth and forestland converted to agriculture to meeting up the food shortage (*http: Banglapedia, search.com.bd/ht/foo44.htm.*) With mild temperature, tropical climate, fertile soil, ample water, abundance of fish, rich ecology and biodiversity and forests, various flora and fauna, Bangladesh was environmentally very rich than other parts of the earth. Unfortunately, this rich environment is degraded due to various causes such as population growth, human interventions, indiscriminate use of environmental resources, unplanned urbanization and infrastructure development, industrialization, poverty, food shortage, introducing modern agriculture technology and so on. It is disappointing that some of species of flora and fauna are in endangered and some of them are going to be extinguished (*http: Banglapedia, search.com.bd/ht/foo44.htm*). Presently Bangladesh has been suffering from various environmental problems such as various pollution, urban solid waste disposal, deforestation, bio-diversity degradation, ecological imbalance, climate changes, land degradation, wetland degradation, water scarcity, and other environmental resources degradation *etc*. (Ram, 1993 and Eswarn *et al.*, 2001).

Now a days, government of Bangladesh is very concerned to present environmental problems and has taken many initiatives to protect and conserve the environment.

Initiatives taken in Bangladesh are as formulating and updating laws and policies, implementing various projects to mitigate the present environmental problems, formulating some long term environmental action plans, ratifying different international and regional treaties. Because policy makers, development experts, civil societies, other Government and Non-government organizations realized that the conservation and promotion of environment is quite impossible without regulations. So in recent years, Government has enacted some important environmental laws such as the Environment Conservation Act, 1995, Environment Court Act, 2000, formulated Environment Rules 1997, Environment Policy 1992, Environmental Action Plan 1992 and some other important rules and policies are under consideration for enacting. Moreover, the government is trying to reactivate the so-called other environmental laws already existed in the country from British and Pakistan period. However the major environmental problems created in Bangladesh are briefly discussed here.

Pollution of Environment

Pollution is one of the main causes of the environmental degradation in Bangladesh.

It is defined in the section 2(b) of the Bangladesh Environment Conservation Act, 1995 that "Pollution" means such contamination or alteration of the physical, chemical or biological properties of air, water, soil, including change of their temperature, taste, turbidity, odor, density or any other characteristic of these, or such discharge of any liquid, gaseous, solid, radio active of other substances into air, water, or soil or any elements of the environment as well or is, likely to create nuisance or render such air, water or soil harmful, detrimental or disagreeable to public health or to domestic, commercial, industrial, agricultural, recreational or other bonafide uses, including livestock, wild animals, birds, fish, plants or other forms of life (Act 1 of 1995).

As developing country, Bangladesh has been suffering from various pollutions though industrialization is still very insignificant. Due to unplanned industrialization and urban development, surrounding areas of the capital city and Chittagong are very polluted through discharging of untreated industrial waste, urban solid waste dumping to here and there *etc*. There are some other sources of pollution in Bangladesh such as from medical waste, agrochemicals and fertilizer polluting water in even rural areas of Bangladesh. In Dhaka and other big cities, air and noise pollution has become a problem due to gas emissions from old and unscientific vehicles and noise pollution due to hydraulic horn and unnecessary use of horn. However, major pollution sectors in Bangladesh are discussed here.

Air Pollution of Environment

Air pollution is the introduction into the atmosphere of chemicals, particulates, or biological materials that cause discomfort, disease, or death to humans, damage other living organisms such as food crops, or damage the natural environment or built environment.

The atmosphere is a complex dynamic natural gaseous system that is essential to support life on planet Earth. Stratospheric ozone depletion due to air pollution has long been recognized as a threat to human health as well as to the Earth's ecosystems.

Air is an integral part of life and man cannot live even for a minute without air. It is a life sustaining precious natural resources. Fresh air is one of the most indispensable gifts of nature without which mankind cannot survive. It is essential to keep air and the

atmosphere free from pollution for survival of human being as well as other living beings in the earth. This natural resource may be interfered by human activities. Bangladesh is a predominantly agro-based and a least developed country. Its industrial base is not very developed. Industries are mainly concentrated in major urban areas, particularly capital Dhaka, the port city of Chittagong and the divisional towns *etc*. The situation of Dhaka is the most alarming, mainly due to vehicular emission, brickfields, unscientific burning of - coal and fuel wood *etc*. Air pollution is accordingly concentrated mainly in Dhaka and Chittagong in Bangladesh. The impacts of air pollution in these two cities are very alarming than other part of Bangladesh. People of two cities are sufferings from air pollution affecting respiratory tract, causes irritation of eyes, annoyance to the human sense, headache, fatigue, asthma, high blood pressure, hear diseases *etc*. There are a few legal mechanisms to mitigate the pollution of the environment in Bangladesh.

Water Pollution of Environment

Water pollution is the contamination of water bodies (*e.g.* lakes, rivers, oceans, aquifers and groundwater). Water pollution occurs when pollutants are discharged directly or indirectly into water bodies without adequate treatment to remove harmful compounds.

Water pollution affects plants and organisms living in these bodies of water. In almost all cases the effect is damaging not only to individual species and populations, but also to the natural biological communities.

Water pollution is a major global problem which requires ongoing evaluation and revision of water resource policy at all levels (international down to individual aquifers and wells). It has been suggested that it is the leading worldwide cause of deaths and diseasesand that it accounts for the deaths of more than 14,000 people daily. An estimated 700 million Indians have no access to a proper toilet, and 1,000 Indian children die of diarrheal sickness every day. Some 90% of China's cities suffer from some degree of water pollution and nearly 500 million people lack access to safe drinking water. In addition to the acute problems of water pollution in developing countries, developed countries continue to struggle with pollution problems as well. In the most recent national report on water quality in the United States, 45 percent of assessed stream miles, 47 percent of assessed lake acres, and 32 percent of assessed bays and estuarine square miles were classified as polluted (EPA, 2007).

Water is typically referred to as polluted when it is impaired by anthropogenic contaminants and either does not support a human use, such as drinking water, and/or undergoes a marked shift in its ability to support its constituent biotic communities, such as fish. Natural phenomena such as volcanoes, algae blooms, storms, and earthquakes also cause major changes in water quality and the ecological status of water.

Water like air is a basic necessity without which life cannot be maintained (Ram, 1993). It is in deed, the very basis of human life. Water is the principal constituent of the human body. It is indispensable to the metabolic processes in the cells. All human beings need safe and pure water for drinking purposes. Water resource is one of the main issues of the environment in Bangladesh. But this resource is exploited and polluted in many ways. Water pollution means any undesirable and harmful change in the quality of water. Factories, household wastages, plants, sewage treatment plants, municipal sewage, untreated industrial wastes toxic materials, detergents, animal manure *etc*., are considered the sources of water pollution. Water pollution has brought out degradation of water ecology affecting aquatic organism. Pollution continues unabated causing a number of water borne diseases (Rahman *et al.*, 1994). Untreated industrial waste dumping into rivers causes open water pollution that damages the aquatic environments. Residues of agro-chemicals are polluting the open water bodies, which is adversely affecting the freshwater fisheries and other aquatic resources in Bangladesh. Industrial toxic waste, oil spilling, dumping of trash fish, urban household and clinical waste are the other causes of water pollution in Bangladesh.

Noise Pollution of Environment

Noise pollution is excessive, displeasing human, animal, or machine-created environmental noise that disrupts the activity or balance of human or animal life. The word noise may be from the Latin word nauseas, which means disgust or discomfort. The source of most outdoor noise worldwide is mainly construction and transportation systems, including motor vehicle noise, aircraft noise, and rail noise. Poor urban planning may give rise to noise pollution, since side-by-side industrial and residential buildings can result in noise pollution in the residential areas (Hogan and Latshaw, 1973).

High noise levels can contribute to cardiovascular effects in humans, a rise in blood pressure, and an increase in stress and vasoconstriction, and an increased incidence of coronary artery disease. In animals, noise can increase the risk of death by altering predator or prey detection and avoidance, interfere with reproduction and navigation, and contribute to permanent hearing loss.

The noise pollution in Bangladesh is so acute all over the country. The term pollution is being used because the noise level is so high than standard level that causes various kinds of diseases of the ear in human beings. In those cities noise pollution is being created due to over population, hydraulic horns, band transport vehicles, loud speakers, construction drills, auto rickshaw engine *etc*. It can cause people completely deafness, high blood pressure, headaches, annoyance, affects the nervous system *etc*. (Singh, 1992).

Land Degradation as Pollution of Environment

Land degradation is a process in which the value of the biophysical environment is affected by one or more combination of human-induced processes acting upon the land also environmental degradation is the gradual destruction or reduction of the quality and quantity of human activities, animals activities or natural means example water causes soil erosion, wind, *etc*. It is viewed as any change or disturbance to the land perceived to be deleterious or undesirable Natural hazards are excluded as a cause, however human activities can indirectly affect phenomena such as floods and bush fires. Shrimp farming deals major blow to coastal zone of Bangladesh.

This is considered to be an important topic of the 21st century due to the implications land degradation has upon agronomic productivity, the environment, and its effects on food security. It is estimated that up to 40% of the world's agricultural land is seriously degraded (Eswaran *et al.*, 2001).

Poverty with rapid population growth, absence of a proper land use policy, and other driving forces compel people in Bangladesh to over-exploit natural resources like land, which forms a major focus for human economic activities. The functional capabilities of the soil have deteriorated due to imbalanced use of agrochemicals, unplanned land use, encroachment on forest areas for agriculture and settlements, ineffective implementation

of existing laws and guidelines, and improper disposal of hazardous industrial effluents. In addition, urban sprawling and infrastructure development have reduced the availability of land. Natural events such as cyclones and floods cause land loss and also decrease the functional capabilities of soil. Soil degradation in the coastal area results from unplanned land use and due to intrusion of saline water. The extent of land degradation varies according to region, season, and year due to the diverse nature of the driving forces and causes.

Land degradation in the Chittagong Hill Tracts (CHT) is occurring mainly due to rapid changes in demography, traditional shifting cultivation practices *(Jhum)*, construction of roads and high ways and other physical infrastructure. The Madhupur forest area has been denuded due to deforestation, which has been accelerated by many other factors such as its closeness to the capital city and improved road communication leading to displacement of population, urbanization and industrialization in that area. Land degradation in the Barind Tract is caused mainly due to over exploitation of biomass from agricultural lands, and cultivation of HYV rice through groundwater irrigation. The process has been aggravated by irregular rainfall and insignificant water flow of the rivers that normally play a vital role in replenishing soil fertility and recharge groundwater.

Degradation of soil quality in the floodplains is mainly attributed to improper use of fertilizers and pesticides to boost agricultural production. Gradual siltation in the floodplains also contributes towards degradation of land. Dispersed industrial growth, and uncontrolled discharge of untreated effluents in the nearby floodplain deteriorate the quality of land and soil. Land degradation in the coastal areas of Bangladesh is mainly due to cyclones and storm surges inundating the land. Shrimp cultivation occurs round the year in these areas, which is ultimately increasing the salinity and degrading soil as well. Intrusion of saline water in the dry season is attributed to the low flow in the river system.

Erosion of topsoil in the hill districts has increased and 17 % of the soil resources have deteriorated between 1964 and 1985. It was found that in the mixed forest-covered land, the topsoil erosion rate is 2.7 to 7.2 tons per hectare per annum. On the other hand, in the deforested hill slopes erosion goes up to 120 tons per hectare per annum. A study in Khagrachari, Rangamati, and Bandarban areas on topsoil erosion showed that it ranges from 100 to 120 tons per hectare annually.

The concentration of organic materials present indicates the quality of soil and this has deteriorated significantly in the Barind Tract, Madhupur Tract, Himalayan Foothill areas, the floodplains of *Tista*, *Karatoya*, and *Bangali*, and in the hilly Northeast region. Moderate deterioration of organic materials has been observed in the medium highlands of the rivers *Tista*, the *Jamuna*, and in the *Ganges* floodplain

The Soil Resources Development Institute (SRDI) has analyzed soil samples, and found that nitrogen deficiency is common all over the country. The Sylhet *Haor* areas, *Surma-Kushiyara* floodplain, Northeast hilly area, and Madhupur Tract have a noticeable and intense deficiency of phosphorus. A deficiency in other chemical substances has also been noticed in other parts of the country.

Bangladesh is experiencing a decline or stagnation in the yield of many crops. At present, there is meager HYV rice cultivation in the coastal areas. The environment is also unsuitable for cultivation of any other grain during dry period, except wheat where the temperature permits, and early sowing is possible. This is because both dry period *Boro* and wheat are cultivated in the winter season when salinity also reaches to its maximum, and renders most of the coastal land unsuitable for their production.

Real and effective ways to minimize land degradation problems should be based on multi- sectored, multi-layered, yet integrated approaches. The most important policy measure required for addressing land degradation is an integrated land use policy with respect to agriculture, industry and environment. Noting the importance of such an instrument, the Government of Bangladesh has already made some progress in this direction. A Draft Land Use Policy has been prepared, which is under discussion for government approval. This policy also highlights other uses of land for different social and cultural purposes. Certified land ownership is one of the important aspects of the land use policy aimed at reducing ownership-related problems and crime. In order to implement the land use policy successfully, it emphasizes mass awareness programs for the general population and government administration.

Very recently the government has approved the Agricultural Policy of 1999. It also started Integrated Pest Management (IPM) from 1981, which have already been through several phases of research and extension. IPM has an immense contribution to reduce the

use of pesticides for crop production. Results show that it has the potential to increase crop production directly, and yet contaminate soil very little. Considering these benefits, the Government initiated the National Integrated Pest Management Policy in 2000. Another concept that is emerging to combat land degradation is called Integrated Plant Nutrient System (IPNS), which involves application of external nutrients based on the soil supplying capacity and the crop need.

Soil Erosion and Fertility Degradation as Pollution of Environment

Erosion is the process by which soil and rock are removed from the Earth's surface by natural processes such as wind or water flow, and then transported and deposited in other locations.

While erosion is a natural process, human activities have dramatically increased (by 10-40 times) the rate at which erosion is occurring globally. Excessive erosion causes problems such as desertification, decreases in agricultural productivity due to land degradation, sedimentation of waterways, and ecological collapse due to loss of the nutrient rich upper soil layers. Water and wind erosion are now the two primary causes of land degradation; combined, they are responsible for 84% of degraded acreage, making excessive erosion one of the most significant global environmental problems we face today (Humberto and Rattan, 2010).

Industrial agriculture, deforestation, roads, anthropogenic climate change and urban sprawl are amongst the most significant human activities in regards to their effect on stimulating erosion. However, there are many available alternative land use practices that can curtail or limit erosion-such as terrace-building, no-till agriculture, and revegetation of denuded soils**.**

In Bangladesh erosion is a regular and recurring phenomenon. An increase in rainfall in summer is apprehended due to climate change and causes surface erosion. Soil erosion may be classified into water erosion, glacier erosion, snow erosion, wind erosion *etc*. Soil erosion is created due to grazing, riverbank erosion, flood, heavy rainfall, over population, deforestation, *etc*.

Riverbank erosion is a serious problem in Bangladesh. It is a process largely controlled by river dynamics. The disruption in the life of many local communities is almost a continuous process, due to riverbank erosion, and the changing course of rivers. During floods, riverbank erosion becomes very acute and leads to loss of valuable land.

Coastal erosion is another problem. The last few decades 70% of the world's coastline has shown net erosion globally and less than 10% has net degradation and the remaining 20% has remained relatively stable. Erosion in the coastal regions of Bangladesh is caused by a number of factors, such as high monsoon wind, waves and currents, strong tidal actions, and storm surges (Ali, 1997). Environment pollution, River and Water pollutions are increasing day by day.

Wetland and Water Resources Degradation as Pollution of Environment

A wetland is a land area that is saturated with water, either permanently or seasonally, such that it takes on the characteristics of a distinct ecosystem. Primarily, the factor that distinguishes wetlands from other land forms or water bodies is the characteristic vegetation that is adapted to its unique soil conditions: Wetlands consist primarily of hydric soil, which supports aquatic plants.

The water found in wetlands can be saltwater, freshwater, or brackish. Main wetland types include swamps, marshes, bogs and fens. Sub-types include mangrove, carr, pocosin and varzea.. Wetlands play a number of roles in the environment, principally water purification, flood control, and shoreline stability. Wetlands are also considered the most biologically diverse of all ecosystems, serving as home to a wide range of plant and animal life.

Bangladesh has a lot of areas of wetlands having rivers, streams, freshwater lakes and marshes. Wetland is a very important factor for the conservation and development of the environment in Bangladesh. Wetland resources are crucial to the environment and development of Bangladesh. In Bangladesh wetland is degraded due to human interventions such as flood control and irrigation infrastructure development, roads, bridge, dams and cross dams *etc*. Again excessive sedimentation in wetlands, mono-cropping pattern and deforestation are causing soil erosion. Many wetlands are degraded due to industrial wastes.

The reduction of wetlands affects the breeding of freshwater fishes and other wetland products. It has an adverse impact on the viability of the ecosystems on the long term basis. Wetland shrinking causes the water resources depletion for which our environment faces numerous problems and degradation. For development wetlands are very important in Bangladesh because wetlands support human settlements, biodiversity, fisheries, agricultural, navigation and communication *etc*. However, it is predicted that SLR will cause a reduction in fish production by reducing the freshwater fishing area. Decreased rainfall and river runoff and increased evaporation during winter will also reduce the winter fishing area. Pond culture in the coastal area will be affected by intrusion of salt water into the ponds, unless embankments are made around them. Shrimp farming in the coastal area is a lucrative business, but increase in salinity is likely to jeopardize it as well (Ali, 2000).

Deforestation as Pollution of Environment

Deforestation, clearance or clearing is the removal of a forest or stand of trees where the land is thereafter converted to a non-forest use. Examples of deforestation include conversion of forestland to farms, ranches, or urban use.

About half of the world's original forests had been destroyed by 2011, the majority during the previous 50 years. Since 1990 half of the world's rain forests have been destroyed More than half of the animal and plant species in the world live in tropical forests.

The term deforestation is often misused to describe any activity where all trees in an area are removed. However in temperate climates, the removal of all trees in an area[not in citation given in conformance with sustainable forestry practices is correctly described as regeneration harvest. In temperate mesic climates, natural regeneration of forest stands often will not occur in the absence of disturbance, whether natural or anthropogenic. Furthermore, biodiversity after regeneration harvest often mimics that found after natural disturbance, including biodiversity loss after naturally occurring rainforest destruction.

Deforestation occurs for many reasons: trees are cut down to be used or sold as fuel (sometimes in the form of charcoal) or timber, while cleared land is used as pasture for livestock, plantations of commodities and settlements. The removal of trees without

sufficient reforestation has resulted in damage to habitat, biodiversity loss and aridity. It has adverse impacts on biosequestration of atmospheric carbon dioxide. Deforestation has also been used in war to deprive an enemy of cover for its forces and also vital resources. A modern example of this was the use of Agent Orange by the United States military in Vietnam during the Vietnam War. Deforested regions typically incur significant adverse soil erosion and frequently degrade into wasteland (Toral, 2002).

In Bangladesh, the total forest area covers 26000sqkm, which is 17.6% of the land territory. But it is estimated that nearly 60% of the forest area has been lost. There are many causes of deforestation in Bangladesh such as overpopulation, wide range of poverty, settlement, shifting, cultivation, inappropriate exploitation of forest resources, grazing, illegal filling, use for fuel wood, uncontrolled and wasteful commercial exploitation, lack of awareness of the value of forests and partition of the sub-continent and transfer of the forest to the forest department (Singh, 1992). There are several impact of deforestation such as loss of habitats, loss of biodiversity, changes in local ecology, soil erosion, less water preservation and increased flood in the country (Gain, 2002).

The coastal belt areas are totally degraded and removed leaving no hope for regenerating mangrove forest. The annual average rainfall is decreasing because of absence of transpiration, which is caused by brutal of deforestation. Almost all the mangrove forests have unprotected due to introduction of shrimp cultivation. A few Acts remain in this regard.

1.3 Definition of Key Terms

Environmental Law

Environmental law is a complex and interlocking body of Treaties, Conventions, Statutes, Regulations, and Common law that operates to regulate the interaction of humanity and the natural environment, toward the purpose of reducing the impacts of human activity. The topic may be divided into two major subjects: (1) pollution control and remediation and (2) resource conservation and management.

Environmental law draws from and is influenced by principles of environmentalism, including ecology, conservation, stewardship, responsibility and sustainability. Pollution control laws generally are intended (often with varying degrees of emphasis) to protect and preserve both the natural environment and human health. Resource

conservation and management laws generally balance (again, often with varying degrees of emphasis) the benefits of preservation and economic exploitation of resources. From an economic perspective environmental laws may be understood as concerned with the prevention of present and future externalities, and preservation of common resources from individual exhaustion.

The law embraces a wide spectrum of environmental issues. This may include the natural environment, namely physical conditions of land, health, social and other man made conditions affecting human beings on earth (Leelakrishnan, 1999). The law relating to the environment is derived from two principal sources, namely common law developed by courts, through judicial precedents, and the statutory law with regulations, or bye-laws made there under. The statutes and the constitution are the primary and formal sources of environmental law. Moreover, the various forms of delegated legislation, such as regulations, rules, orders and schemes are the main pieces of legislation in environmental law and also discretion are the feature of the environmental law. Environmental law is a synthesis of principles, concepts and norms generated by other laws. It has now been accepted, with or without alteration, as concepts of civil liability, criminal liability, which had their origin in tort (Leelakrishnan, 1999). Indian subcontinent, environmental law is originated through the Landmark Public Health Act, 1875 passed by the British ruler (Leelakrishnan, 1999). Environmental laws are of two kinds (Leelakrishnan, 1999) such as statutory law and common law.

Statutory Laws Relating to Environment

Statutory laws are passed for environmental protection and resource management. It is written by and agreed upon by legislative bodies. Such laws generally establish broad goals such as protection of health and the environment by reducing air pollution, or the judicious use of natural resources. Technical details such as the setting of standards pollution control requirements and resource management programs are worked out by various government agencies. Initially, statutory laws set standards of acceptable behavior and call on agencies to determine regulations. Then, in the next stage, such laws provide authority for various enforcing agencies to take legal action to fine polluters or to take polluters to the court to face criminal charges and possible Jail or sentences.

Common Laws of Environment

Many environmental cases are disposed on the basis of common law. A common law is a body of unwritten rules and principles derived from thousands years of legal decisions. Common law is based on proper or reasonable behavior. Common law is a rather flexible form of law that attempts to balance competing societal interests. In deciding the case, the court relies on common law principles. It weighs the legitimate interests of the company in doing business and the interests of society.

Environmental Policy

The existence and progress of life depend on earth and its environment. In recent times, gradual degradation of the environment has posed a serious threat to the existence of all living beings and to the progress of human civilization. In view of the various adverse impacts on environment, the Government of Bangladesh has given special importance to its protection and improvement. Implementation of government's commitment to environment and mitigation of environment related problems are possible only through a well defined national policy and the Government has already formulated some policies and strategies to protect the environment such as environment policy, 1992 and the environment action plan, 1992 (Farooque and Hasan, 1996; Farooque, 1997).

1.4 Description of Biodiversity in Bangladesh

Biodiversity

The word "biodiversity" is a contraction of' biological diversity. Diversity is a concept which refers to the range of variation or differences among some set of entities; biological diversity thus refers to variety within the living world. The term 'biodiversity' is indeed commonly used to describe the number, variety and variability of living organisms. The very broad usage, embracing many different parameters, is essentially a synonym of 'Live on Earth'. Biodiversity is total variety of life on earth. Our planet contains a diversity of lives from single-celled to enormous sized animals like blue whale. Distinctive varieties of living organisms are found in water and on land. Biological diversity refers to the variety in the web of life on earth. The base of which is the species. In fact, species is the *"building blocks"* of the biodiversity. It is hard to imagine what millions of species mean

in practice, but they are just one aspect of the immense biological diversity of our planet, commonly shortened to "biodiversity". Biodiversity is an umbrella term for the degree of nature's variety, including both the number and frequency of ecosystem, species and genes in a given assemblage (Odum, 1971).

According to the convention of biodiversity (1992), Biodiversity means the variability among living organisms from all sources including, *inter alio,* terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems (Bahsar, 2004).

According to U.S. Office of Technology Assessment (1987) “the variety and variability among living organisms and the ecological complexes in which they occur.” This concept can be subdivided into three levels. Biological diversity at its most basic level includes the full range of species on Earth, from species such as bacteria, viruses, and protests through the multicultural kingdoms of plants, animals, and fungi. At finer levels of organization, biological diversity includes the genetic variation within species, both among geographically separated populations and among individuals within single populations. On a wider scale, biological diversity includes variations in the biological communities in which species live, the ecosystems in which communities exist, and the interactions among these levels (Primack, 1993).

According to Gain, 1997 “Biodiversity is the diversity, frequency and variety in genes, species and ecosystems in the biosphere”.

Origin of the Word Biodiversity

In modern age the word ‘Biodiversity’ is well known to the environmental scientist. This word derived from two words Biological and Diversity. Before 1980s this word is unknown to the natural scientists. In 1980, published by Lovejoy *et al.,* two articles “Change in biological diversity” and “Ecology and living resources- biological diversity” these two articles are the origin of Biodiversity. W. Rosen first used this word Biodiversity in 1986 (In: Paul and Sarker, 2001).

In wide sense, Biological resources and diversity form on the basis of both the ecology and economy of Bangladesh. The country’s agriculture, fisheries and livestock, along with a number of other sectors are heavily dependent, directly or indirectly on biological

resources. Bangladesh possesses good terrestrial and aquatic environment that provide habitat for a large number of plants and animals. The delta is rich in fish and aquatic resources and other biodiversity.

Classification of Biodiversity

Biodiversity is a composite of genetic information, species and ecosystems. It has become a widespread practice to define biodiversity in terms of genes, species and ecosystems, corresponding to three fundamental and hierarchically-related levels of biological organisms (Bashar, 2004).

Biodiversity has three main components. These are as follows:

1. Species Diversity
2. Genetic Diversity
3. Ecosystem Diversity

Species Diversity

Biodiversity of a given area is characterized by the presence of different kinds of ecosystems; its species diversity, including number of species and the number and distribution of endemic species (those limited to a particular country, province or locality); and its contribution to the genetic diversity of particular species, which is very important to plant breeders and which allows a wide range of characteristics among individuals, sometimes including distinct sub-populations, each with its own geographical range and genetic traits (Bashar, 2004).

So species diversity describes the number and variety of species in a given area.

Species diversity represents the range of evolutionary an ecological adaptations of species to particular environments (Primack, 1993) according to Paul, 2001, species diversity is divided into two. These are:

A. Intraspecific
B. Interspecific

Intraspecific: A botanical variety among the subspecies under same species is called Intraspecific.

Interspecific: Varieties among the two or more species under the same order is called Interspecific (Paul and Sarker, 2001).

Genetic Diversity

Gene is a single part of chromosome. It maintains genetically continuation. Genetic resources are potential characteristics of plants and animals that are transmitted through generations and may include disease resistance, fast growth, yield or quality factor or the presence or absence of a chemical. The characteristics, *i.e.*, genetic diversity reside in the germplasm of different cultivators, races and varieties of a species. Russian scientist Vanllov discovered the existence of a few areas on the earth, which contained rich bio-diversity of the main food and fiber crops of the world. These are called the *Vanllov centers* after him. Fortunately, Bangladesh lies within one such center. It has a rich genetic diversity of such crops as amaranths, banana, brinjal, cotton, bean, jute, lime, litchi, mango, rich, sugarcane, tea *etc*. the number of rich cultivars is estimated to be 8,000. Varieties if other useful plant species have not been recorded. However, various Research Institutes in the country has acquired the germplasm of about 5,000 rice, 3,685 jute and allied species, 256 tea, 1098 timber and bamboo, and 2,929 varieties of miscellaneous crops other than rice, jute, tea and suarcane. No' information on the animal gene diversity Tally of cattle, poultry, ducks and other birds and animals available (Karim, 2004).

Genetic diversity is needed by any species in order to maintain reproductive vitality, resistance to disease, and ability to adapt to change the conditions. Genetic diversity within domestic plants and animals is of particular value in the breeding programs necessary to sustain modern agricultural species (Primack, 1993)

Ecosystem Diversity

Ecosystem diversity describes the variety of different ecosystems found in a region. A categorization of the combination of animals plants, micro organisms, and the physical environment with which their associated, is the basis for recognizing ecosystems. (Bashar, 2004). Ecosystem diversity relates to the variety of habitats, biotic communities and ecological processes in the biosphere as well as the diversity within ecosystems.

There are three major ecosystems in Bangladesh

These are as follows

1. Terrestrial Ecosystem
2. Mangrove Ecosystem
3. Aquatic Ecosystem

Terrestrial Ecosystem

A community of organisms and their environment that occurs on the land masses of continents and islands. Terrestrial ecosystems are distinguished from aquatic ecosystems by the lower availability of water and the consequent importance of water as a limiting factor. Terrestrial ecosystems are characterized by greater temperature fluctuations on both a diurnal and seasonal basis than occur in aquatic ecosystems in similar climates. The availability of light is greater in terrestrial ecosystems than in aquatic ecosystems because the atmosphere is more transparent than water. Gases are more available in terrestrial ecosystems than in aquatic ecosystems. Those gases include carbon dioxide that serves as a substrate for photosynthesis, oxygen that serves as a substrate in aerobic respiration, and nitrogen that serves as a substrate for nitrogen fixation. Terrestrial environments are segmented into a subterranean portion from which most water and ions are obtained, and an atmospheric portion from which gases are obtained and where the physical energy of light is transformed into the organic energy of carbon-carbon bonds through the process of photosynthesis
(http://en.wikipedia.org/wiki/Terrestrial_ecosystem, February 2011).

Most of Bangladesh terrains are alluvial plain with hilly areas on its northern and eastern boundaries. The landmass is crisscrossed with innumerable rivers and canals. Although most of the plain land has been converted into crop fields yet the land may be divided into several divisions whose microenvironment, vegetation and fauna is somewhat different from each other. There are hilly areas with evergreen and semi-evergreen forests (1.4 million hac) mostly in the eastern part of the country. Tropical moist deciduous forests, also known as inland sal forests (0.12 million hac) are distributed in small patches over the central inland plans and there are also rural tree groves distributed throughout the country over an area of 0.27 million hac. There is no satisfactory record in favour of biodiversity in Bangladesh. The total forest area controlled by Forest and Environmental

Department has been reduced to about 4-6% of the total area over 15% in last several decades. Already 34 plant and 136 vertebrate animal species are under severe threat of extinction; 12 mammal, 4 birds and 1 reptile species are reported to have become extinct from Bangladesh (Karim, 2004).

Mangrove Ecosystem

Mangrove constitutes a type of habitat forming forests in estuaries, salty marshes and muddy coasts between high tide and low tide levels (Diagram 1.3). The mangrove ecosystem in the south and southwestern deltaic zone of the country supports tropical littoral and swamp forests, which include the Sundarban (0.67 million ha) the largest patch of mangrove forests in the world (Karim, 2004). Twenty-six of the fifty broad mangrove types found in the world grow well in the Sundarbans. The commonly identifiable vegetation that grow in the dense mangrove forests at the Sundarbans are salt water mixed forest, mangrove scrub, brackish water mixed forest, littoral forest, wet forest and wet alluvial grass forests. The Bangladesh mangrove vegetation of the Sundarbans differs greatly from other non-deltaic coastal mangrove forests and upland forests associations.

The Sundarbans Mangroves ecoregion on the coast forms the seaward fringe of the delta and is the world's largest mangrove ecosystem, with 20,400 square kilometers (7,900 sq mi) of area covered. The dominant mangrove species *Heritiera littoralis* is locally known as Sundri or sundari. Mangrove forests are not home to a great variety of plants. They have a thick canopy, and the undergrowth is mostly seedlings of the mangrove trees. Besides the sundari, other species that make up the forest include *Avicennia spp.*, *Xylocarpus mekongensis*, *Xylocarpus granatum*, *Sonneratia apetala*, *Bruguiera gymnorrhiza*, *Cereops decandra*, *Aegiceras corniculatum*, *Rhizophora mucronata*, and *Nypa fruticans* palms.

The Sundarbans area is one of the most densely populated in the world, and the population is increasing. As a result, half of this ecoregion's mangrove forests have been cut down to supply fuelwood and other natural resources. Despite the intense and large-scale exploitation, this still is one of the largest contiguous areas of mangroves in the world. Another threat comes from deforestation and water diversion from the rivers inland, which causes far more silt to be brought to the estuary, clogging up the waterways.

Aquatic Ecosystem

An aquatic ecosystem is an ecosystem in a body of water. Communities of organisms that are dependent on each other and on their environment live in aquatic ecosystems. Bangladesh is a riverine country. There is 0.55 million hac of estuarine zone of the river system, 0.43 millions hac of freshwater zone of the river systems. Besides there are many haors, baors and beels, ponds, borrow pits and lakes (0.33million hac) in the country which support a diversified aquatic flora and fauna including millions of migratory birds annually. The wetlands with their bird fauna and the fisheries resources of the open water fisheries are under severe threat. These threats to our aquatic ecosystem are increasing day by day because of human interference such as flood control embankments, drainage systems and conversion of inundated lands into crop land have reduced the water area, prevented or altered the seasonal migratory routes of many fishes and reduced grading and natural stocking of fishes in many water bodies, construction of upland roads and homesteads on wet land, pollution from domestic and agro chemical waste products and their runoff, hunting trapping, and disturbances of aquatic birds., management of open water fisheries through auction; ineffective legal measures for the protection of undersize fish (Karim, 2004). The wetlands with their bird fauna and the fisheries resources of the open water fisheries are under threat. The inland water bodies are also the habitat of 56 species of prawns. More than 20 species of freshwater molluscs have been identified. The marine water bodies are also remarkable in biodiversity, harboring 442 species of fish and at least 36 species of marine shrimps. About 336 species of molluscs, representing 151 genera have been identified from the Bay of Bengal. In addition, several species of crabs and 31 species of turtles and tortoises, of which 24 live in freshwater are found in Bangladesh.

Values of Biodiversity

The term biodiversity is becoming more and more widely used and the implications of its loss more widely recognized. However, biodiversity is a complex and vague term, which often does more to complicate a problem than to clarify it. To identify the value of biodiversity it is the key characteristic to know the reasons for global biodiversity losses. The valuation of biodiversity may be recognized in many ways.

Biodiversity and Poverty

Poor people, especially those living in areas with low agricultural productivity, depend heavily and directly on genetic, species, and ecosystem biodiversity to support their livelihood, They receive fewer benefits from biodiversity and bear most of the cost of developmental activities that reduce biodiversity.

Biodiversity in Food Security

The husbandry of domesticated species, wild plants and animals are the mainstay of human food production around 840 million people in the world do not enough eat but the population are growing. This means that food production will have to increase 50% by 2020. Biodiversity is the solution because it provides the genetic information used in plant and animal breeding.

Biodiversity in Agriculture

The reservoir of genetic traits present in wild varieties and traditionally grown landraces is extremely important in improving crop performance. Important crops, such as, potato, banana and coffee, are often derived from only a few genetic strains. Improvements in crop species over the last 250 years have been largely due to incorporating genes from wild varieties and species into cultivars. Crop breeding for beneficial traits has helped to more than double crop production in the last 50 years as a result of the Green Revolution. A biodiversity environment preserves the genome from which such productive genes are drawn. To feed, growing world population, it is necessary to increase the crop production. It will depend on both improved yields and increased areas under crops. There are about 7000 plants species recorded as food and agricultural crops out of 270000+higher plants species. Only 150 of these are commercially important and only four (wheat, rice, sugar and maize) account for 63% of the world's plant derive calorie intake.

Biodiversity and Livestock

It has been estimated that livestock contribute to the livelihood of at least 70% of the world rural poor Animal and domestication began almost 12,000 years ago among 40,000 vertebrate species on the Earth, 40 were sleeted as useful by different human cultures and domestication of these only 14 species account for over 90% of today's global livestock production.

Bangladesh Livestock Research Institute (BLRI) was established in 1984 by a Presidential Ordinance. Mandates of the Institute are to: identify livestock and poultry production constraints at the national and farm level, solve those problems through multi and inter-disciplinary and inter-institutional research and to develop technologies to help food and nutrition security for the increasing population, poverty alleviation, employment opportunities, income generation and control of environmental pollution. Poultry is now a most important source protein for human being. The poultry industries have been largely erupted through the country in the last two decades. Beef and mutton are also a rich source of protein. Now a day the production of cow and goat is increasing by farming. Most of the poor and ultra-poor people of Bangladesh depend on fisheries, birds and mammals *etc*.

Biodiversity and global fisheries: Global fisheries are extremely important for developing countries who are the chief global exporters. The role of fish in supporting the livelihoods of rural communities is also important. There are around 28,000 recorded species of fish, 40% of which are fresh water. 25% marine fish species are associated with coral reef's other ecosystems such as mangroves are important in providing shelter for the young of many species.

Biodiversity and Bangladesh Fisheries

Bangladesh is rich with animal diversity and water recourses. As a sub sector of our agriculture the fisheries is very important and potential. A big number of fisheries productions are found from 80% of internal open water bodies and 12% of internal closed water bodies of Bangladesh. From the observation of last 10 years it is found that the total production of total fishes in the session 1999-2000 was 16.61 lac metric tones which was dramatically increased in the session 2008-2009. In the session 2008-2009, this production of fishes was 27.01 metric tones. In those decades the fish production from internal open water bodies was in satisfactory position. But the production rate of fishes from river and deep sea was not satisfactory in those decades (Jatio Motso Sptaho-2010, Sonkolon).

Tourism and Biodiversity

The quality of their natural environments gives many development countries a comparative advantage in tourism. Tourism can capture some of the global willingness to play for biodiversity by raising funds for investment in conservation and sustainable use and can raise the awareness of developing countries of the value of their biodiversity.

Tourism is an important part of the global economy According to the world Travel and Tourism Council, global travel and tourism directly and indirectly generates 11% pf global GDP. This supports 200 million jobs which accounts for 8% of the world's employment.

Tourism in Bangladesh is a slowly developing foreign currency earner. The country has much to attract international and domestic tourists.

Bangladesh as a holiday making land exposes to many flamboyant facets. Its tourist attractions are many folded, which include archaeological sites, historical mosques and monuments, resorts, beaches, picnic spots, forests and tribal people, wildlife of various species. Bangladesh offers ample opportunities to tourists for angling, water skiing, river cruising, hiking, rowing, yachting, sea bathing as well as bringing one in close touch with pristine nature.

In the northern part, comprising the Rajshahi division, there are archaeological sites, including the temple city Puthia in Rajshahi; the largest and most ancient archaeological site, Mahasthangarh in Bogra; the single largest Buddhist monastery, Paharpur in Naogaon; the most ornamental terracota Hindu temple in Bangladesh Kantaji Temple, and many rajbaris or palaces of old zamindars.

In the south-western part, mainly the Khulna Division, there is the Sundarbans, the largest mangrove forest of the world with Royal Bengal Tiger and spotted deer. The historically and architecturally important sixty domed mosque in Bagerhat is a notable site.

In the south-eastern part, which is the Chittagong division, there are mainly natural and hilly scenarios like Chittagong Hill Tracts, along with sandy sea beaches. The most notable beach is the longest unbroken sandy sea beach in the world in Cox's Bazaar.

In the north-eastern part, Sylhet division, there is a green carpet of tea plants on small hillocks. Natural reserved forests are great attractions. Migratory birds in winter, particularly in the haor areas, are also very attractive in this area.

Biodiversity and Forest

Tropical rainforests contain an estimated 50% of all species on earth. They provide livelihoods to some 400 million people and ecosystem service that are important at local, national and global levels. Forests also contain species of high commercial value and 31%

of tropical rainforests are currently allocated for timber production. Unsustainable practices commonly disrupt forest biodiversity and degrade or eliminate forest habitats. Furthermore; the land that forests occupy is under pressure from agricultural expansion, mining and their development.

Forest is now a most important subsector of our agriculture and it plays vital role to save environmental balance in Bangladesh. Bangladesh has 7.04 million acres of forest land and 5.21 milion acres are government forest and the remaining 1.79 acres are private forest (Kafiluddin, 2001). The major part of the government forest is in Chittagong, Grater Khulna, Sylhet, Dhaka, Mymensing and Tangail. Unfortunately it is true that the half number of districts of Bangladesh has no government forest. Though the area of total forest of Bangladesh is not sufficient for its environment nevertheless it is declining for different kinds of human necessities day by day.

Wildlife and Biodiversity

Wild mammals and birds are important food sources to millions of people who cannot to buy them. In addition, trade in animals Captured from the wild is a multi-million dollar business, providing signification local and national income unsustainable use is beading to losses and extinctions of wild animals, many species are threatened by loss of wild habitats due to clearance and other disturbances.

Bangladesh is a small and over populated country but it is naturally riched. A few decades ago there are many kinds of animal were available through the country. But unfortunately this situation gets change dramatically because of increasing population, hunting animals indiscriminately, unplanned infrastructural development *etc*. The number of animal may seems poor but on the basis of area Bangladesh is considered as an animally riched country. It also makes us frustrated that there was no survey done nationally. However, at first, Dr. Ali Reza Khan revealed a list of 840 wildlife's in 1982. In recent, IUCN of Bangladesh makes a list of 889 Wildlife (Aziz *et al.,* 2010).

Biodiversity and Human Health

Biodiversity can contribute to the human health and to the health to animals and plants on which they depend-

- by keeping population of disease- causing organisms and pests in check
- providing the basic materials as raw material for medical research
- providing genetic information as a raw material for medical research and
- keeping people health by contributing clean water and air.

Many diseases and pests have been controlled parasites and their hosts, have co-evolved over many years, their interaction keep each other check in are a system to biological control.

Road Constructions and Biodiversity

There are many ways to avoid significant impacts on biodiversity and mitigate adverse effects. If tense are considered at the earliest in the planning and design processes, outcomes, are likely to be less harmful. To connect Bangladesh with its capital city there are a number of roads and high ways constructed through the country for which numerous trees are cut off, a large area of forest is vandalized specially in Modhupur forest, a number of ponds, cannels and rivers are damaged. Natore-Bonpara high way passed into the Chalan beel makes a great negative impact on the water biodiversity. If these constructions were done under consideration of EIA report then the impact on the biodiversity may not be highly negative.

Regional Approaches and Biodiversity

National policy and biodiversity planning for biodiversity management take place at the country level, but biodiversity and ecological processes, such as migration and species dispersal, do not conform to national boundaries. Many species migrate across international frontiers.

Using Genetic Resource and Biodiversity

Genes and the biochemical they encode are used to develop products by industries pharmaceutical, herbal medicine, personal care, cosmetic, horticulture, crop, production and biotechnology.

Genetic resources after originate farm tropical regions. In some cones they are collected from lands inhabited by local communities.

Trade Policy and Biodiversity

Trade liberalization policy can have positive environmental impacts. They can improve the efficiency of resource allocation and contribute to economic growth improvement. But such policies can also bead to over-sexploitation of natural resources, loss of wildlife habitats and the replacement of mixed production system with monoculture practices.

Traditionally, people in Bangladesh use to consume very few wildlife species or their products in small quantity. Domestic use of wild life as food, pets and sources of raw materials for making indigenous medicine; and their skins/ hides for making handicrafts is negligible. The turtles, game birds, deer, and boars provide meat; lizards and snakes provide skins; Parakeets and Hill Mayna are raised as pet.

Frogs have a high demand in the international market. This led the Bangladeshi traders to export frog legs in large quantity until the early eighties. Most of the frogs used to be harvested from the wild and exported as a frozen item. Uncontrolled harvest of frogs from the wild adversely impacted not only the food chain, also had an enormous impact on the population of predators such as monitor lizards, snakes and birds of prey.

Turtles, tortoises and terrapins are locally known as Kachim/Kachaap/Kaitta. Bangladesh supports 25 species of Chelonia of which 18 species are fresh water, turtles, five are marine turtles and two are land tortoises. Besides their natural ecological role, the Chelonia population in Bangladesh provides meat protein to a percentage of people, especially the ethnic communities.

The environmental activist from home and abroad strongly demanded a ban of frogs collected from the nature. Under pressure of the wildlife scientists and environmental pressure group, the Bangladesh government proclaimed some laws to control the trade in frog legs, snakes and turtle’s meat imposed a ban on the export.

Biodiversity and Genetically Modified Organism (GMO)

GMO is an organism whose genetic material has been altered using genetic engineering techniques. These techniques, generally known as recombinant DNA technology, use DNA molecules from different sources, which are combined into one molecule to create a new set of genes. This DNA is then transferred into an organism, giving it modified or

novel genes. Transgenic organisms, a subset of GMOs, are organisms which have inserted DNA that originated in a different species. GMOs are used in biological and medical research, production of pharmaceutical drugs, experimental medicine (e.g. gene therapy), and agriculture (e.g. golden rice). The term "genetically modified organism" does not always imply, but can include, targeted insertions of genes from one species into another. For example, a gene from a Jellyfish, encoding a fluorescent protein called GFP, can be physically linked and thus co-expressed with mammalian genes to identify the location of the protein encoded by the GFP-tagged gene in the mammalian cell. Such methods are useful tools for biologists in many areas of research, including those who study the mechanisms of human and other diseases or fundamental biological processes in eukaryotic or prokaryotic cells.

To date the most controversial but also the most widely adopted application of GMO technology is patent-protected food crops which are resistant to commercial herbicides or are able to produce pesticidal proteins from within the plant, or stacked trait seeds, which do both. The largest share of the GMO crops planted globally is owned by the US firm Monsanto. In 2007, Monsanto's trait technologies were planted on 246 million acres (1,000,000 km2) throughout the world, a growth of 13 percent from 2006. However, patents on the first Monsanto products to enter the marketplace will begin to expire in 2014, democratizing Monsanto products. In addition, a 2007 report from the European Joint Research Commission predicts that by 2015, more than 40 per cent of new GM plants entering the global marketplace will have been developed in Asia.

In the corn market, Monsanto's triple-stack corn-which combines Roundup Ready 2 weed control technology with Yield Gard Corn Borer and Yield Gard Rootworm insect control—is the market leader in the United States. U.S. corn farmers planted more than 32 million acres (130,000 km2) of triple-stack corn in 2008, and it is estimated the product could be planted on 56 million acres (230,000 km2) in 2014–2015. In the cotton market, Bollgard II with Roundup Ready Flex was planted on approximately 5 million acres (20,000 km2) of U.S. cotton in 2008.

According to the International Service for the Acquisition of Agri-Biotech Applications (ISAAA), of the approximately 14 million farmers who grew biotech crops in 2009, some 90% were resource-poor farmers in developing countries. These include some 7 million

farmers in the cotton-growing areas of China, an estimated 5.6 million small farmers in India (Bt cotton), 250,000 in the Philippines, South Africa (biotech cotton, maize and soybeans often grown by subsistence women farmers) and the other twelve developing countries which grew biotech crops in 2009. 10 million more small and resource-poor farmers may have been secondary beneficiaries of BT cotton in China.

The global commercial value of biotech crops grown in 2008 was estimated to be US$130 billion.

In the United States, the United States Department of Agriculture (USDA) reports on the total area of GMO varieties planted. According to National Agricultural Statistics Service, the states published in these tables represent 81–86% of all corn planted area, 88–90% of all soybean planted area, and 81–93% of all upland cotton planted area (depending on the year).

USDA does not collect data for global area. Estimates are produced by the International Service for the Acquisition of Agri-biotech Applications (ISAAA) and can be found in the report, "Global Status of Commercialized Transgenic Crops: 2007.

Transgenic animals are also becoming useful commercially. On February 6, 2009 the U.S. Food and Drug Administration approved the first human biological drug produced from such an animal, a goat. The drug, Atryan, is an anticoagulant which reduces the probability of blood clots during surgery or childbirth. It is extracted from the goat's milk. (Source: *Wikipedia*)

Biodiversity and Living Modified Organisms (LMO)

LMO stands for which are those organisms that have been genetically modified through the application of biotechnology including organisms that have been modified by novel recombinant DNA techniques as well as those that have been modified by mutagenesis or classical breeding and selection techniques.

Genes are not invented but LMOs are patentable because they are covered by DNA patents viewed as created by human endeavor rather than nature.

The first and most famous LMO case that set the precedent was Diamond v. Chakrabarty. In 1971 Professor Ananda Mohan Chakrabarty, then a scientist for General Electric, created a "genetically modified" microorganism that ate hazardous waste. General Electric then went to the United States patent office claiming they had "invented" this bacteria and needed a patent - the first patent on a genetically engineered organism.

The Patent Office immediately turned down the request citing a living organism cannot be patented.

In 1980 the U.S Supreme Court ruled in favor of Chakrabarty/ General Electric. The Supreme Court finding in favor of "artificial products" over "natural products" in the Chakrabarthy case was the basis of the 1988 patent grant for the "Harvard-mouse" or Onco Mouse developed as a cancer research tool the rights to the invention are owned by DuPont. (Source: *http://enwikipedia.org/wiki/chitagong-1till-tracts*).

1.5 Present Status of Biodiversity

Population explosion increased necessities and it had lead to over exploitation of the natural resource in Bangladesh. This has affected all forms of habitats adversely depleting the bio-diversity and gene pool. This has exact quantification of this depletion is not possible due to the absence of any institutional organization to monitor these changes. Nevertheless, attempts may be made to assess generally the extent of this depletion on the basis of the various ecosystems.

Crops Diversity

The number of local varieties of varieties crops is steadily declining due to 'the Promotion and economic consideration of only a few selected varieties, especially of the HYV of rice and wheat and other crops. This is causing of irreparable loss to the genetic diversity of our crop plants and their wild relatives. Introduction of exotic carnivorous fishes like African perch and the African catfish poise a threat to the propagation of many indigenous fishes. It is now a concerned issue in Bangladesh which should take in

consideration immediately. There are three prime reasons for which this critical situation has been raised in Bangladesh. These are:

- The lack of adequate conservation efforts to maintain and protect indigenous crop genetic recourses.
- Lack of software for the conservation and propagation of the various local crop varieties.
- Unbalanced competition between the local varieties consequent to the introduction, adoption and promotion of the exotic and locally developed HY varieties (Karim, 2004).

Domestic Animals and Birds (Table 1.1, 1.2 & 1.3)

The population of domestic animals and birds of Bangladesh is insufficient to meet the basic minimum requirements of draft power, meat, milk and eggs. The total number of cattle was estimated at about 2.5 million sheep and goat 14.5 million, poultry 76.5 million heads after 1983-84 agricultural censuses. The resources base declined steadily since the 40s consequent to the human explosion in the country (Karim, 2004).

In addition, the IUCN Bangladesh Red Data Book (2000) has described 22 amphibians, 126 reptiles, 628 birds in total (388 resident and 240 migratory) 110 inland mammals, as well as 3 species of marine mammals in Bangladesh. There are numerous invertebrates in the country that are yet to be identified. Bangladesh supports approximately 5000 species of angiosperms, among which 300 species are being cultivated. Currently the list of medicinal plants are being revised by the Bangladesh National Herbarium and the number is expected to exceed 500 species. There are 224 species of timber yielding plants and 130 fiber plants found among the flora of Bangladesh The Sundarbans support a very rich and diverse fish fauna of 400 species, over 270 species of birds and over 300 species of plants. It is an important staging and wintering area for migratory shore birds, gulls and terns. The Sundarbans comprise the largest remaining tract of habitat for the rare Royal Bengal Tiger *(Panthera tigris)*. St. Martin's Island is an important nesting area for marine turtles and a wintering area for migratory shore birds.

According to the information given by Gazi S. M. Asmat in his book "Bangladesher Bilupta Bannyaprani (Extinct wildlife of Bangladesh)", almost 13 mammals have been extinct such as, Striped Hyena *(Hyaena hyaena),* Wolf *(Canis lupus),* Malayan sun Bear

(Helorctos malayanus), Great One Horned Rhinoceros *(Rhinoceros unicornis),* Smaller One Horned Rhinoceros *(Rhinoceros Sondaicus),* Asiatic Two Horned Rhinoceros *(Dicerohinus sumatrensis),* Gaur *(Bos frontalis),* Banteng *(Bos javanicus),* Wild Buffalo *(Bubalus bubalis),* Black buck *(Antelope cervicapra),* Bulebull *(Bocehpalus tragocamelus),* Swamp Deer/ Barasingha *(Cervus duvauceli),* Pygmy Hog *(Sus salvinus).* 7 birds are also extinct *e.g.* Bengal pinkheaded Dock *(Rhodonessa caryophyllacea),* Indian Peafowl *(Pavo cristatus),* Green Peafowl *(Pavo muticus spicifer),* Greater Adjutant *(Leptoptilos dubius),* Bengal Florican *(Eupodotis bengalensis),* Painted Stork *(Mycteria leucocephala),* King Vulture *(Sarcogyps calvus).* 2 reptiles also extinct *e.g.* Indian Egg eating snake *(Elachistodon westermanni)* and Chittagong Mud Turtle *(Trionyx nigricans).*

Table 1.1
The list of Threatened Plants in Bangladesh

Plant species	Habited
Psilotum triquetrum Sw.	Khulna, Barisal
Tectaria chattagramica	Chittagong
Aglaonema clarki Hook. f.	Bandarban
Aldrovanda vesiculosa L.	Dhaka, Rajshahi
Aquillaria agallacha Roxb.	Sylhet
Cirrhopetalum roxburghii Lindl	Sundarbans
Cymbopogon osmastonii R.N.P	Bogra, Dhaka
Debregeasia dentata Hook. f.	Chittagong
Elaeocarpus lucidus roxb.	Chittagong
Hippocratea macrantha Korth	Chittagong
Homulium schlchtii Kurz	Chittagong
Justicia oreophila Clarke	Chittagong
Knema bengalensis De wilde	Cox's Bazaar
Limnophila cana Griff	Jamalpur
Mantisia spathulata Schutt.	Chittagong, Sylhet
Marsdenia thyrsiflora Hook. f.	Central region of Bangladesh
Ophiorrhiza villosa Roxb.	Chittagong
Phrynium imbricatum Roxb.	Chittagong
Quercus acuminata Roxb.	Chittagong
Rotala sin pliciuscula (S. Kurz) Kuhne	Chittagong, Sylhet
Semecarpus subpanduriformis Wall	Chittagong
Sonneratia griffithii Kurz	Chakoria Sundarban
Spatholobus listeri Prain	Chittagong
Tournefortia roxburghii Clarke	Chittagong, Rangamati
Typhonium listeri Prain	Chittagong
Vatica scapula Dyer	Chittagong
Vernonina Thomsoni Hook f.	Chittagong

Paul *et al.,* 2000

Table 1.2
Status of Inland and Indigenous Vertebrates of Bangladesh

Group	Total no of living species	Extinct	Threatened			
			Critically Endangered (CR)	Endangered (EN)	Vulnerable	Total
Fishes (Freshwater & Brackish water)	266	0	12	28	14	54
Amphibians	22	0	0	3	5	8
Reptiles	109	1	12	24	22	58
Birds	388	2	19	18	4	41
Mammals	110	10	21	13	6	40
Total	885	13	64	86	51	201

(Paul *et al.*, 2000)

Table 1.3
Danger Situation of Wildlife in Bangladesh

Types	Total Number	Number of extinct species	Number of threatened species
Mammals	125	12	40
Birds	179	4	70
Reptiles	124	1	24
Amphibans	19	0	2
Total	847	17	136

(Paul *et al.*, 2000)

1.6 Biodiversity Degradation

The depletion of biodiversity is the result of various kinds of human development interventions that impinge on it through destruction and degradation of land, forest and aquatic habitats. These activities are in the sectors of agriculture, forestry, fisheries, urbanization, industry, transport, tourism, energy, chemicals and minerals *etc*. Deforestation and destruction of natural reserve forests in the Chittagong Hill Tract has been further intensified by development activities such as dams, highways, road construction and other infrastructure development.

The primary cause of the decay of organic diversity is not direct human exploitation or malevolence, but the habitat destruction that inevitably results from the expansion of human populations and human activities (Wilson, 1990).

In the name of development work all over the Bangladesh, we face serious environmental degradation day by day. Some of the major causes of the biodiversity degradation in both the terrestrial and aquatic ecosystems are as follows:

1. Human interference for Agriculture and Settlement

2. Unsustainable use of Natural Resources
3. Hill Clearing, Cutting and Destruction
4. Industrial and Agro-chemical Pollution
5. Deforestation
6. Illegal Hunting
7. Habitats Degradation
8. Wetland Degradation
9. Encroachment *etc*.

In the fisheries sector, shrimp cultivation has become a major concern from the past decade. It has caused serious environmental damage that has harmed fish and other aquatic biodiversity significantly. The physical loss and modification of aquatic habitats for fish, prawn, turtle and other aquatic organisms are said to be the major factors involved in overall fish varieties depletion. Such shrinkage has been the result of thousands of physical structures and drainage systems that have been constructed in Bangladesh in an effort to control floods, cyclones and other natural calamities. These structures have disrupted the natural flow of waters in closed rivers, diverted rivers and have dried up water bodies.

According to the Red List of IUCN, there are 54 species of inland fishes, 8 amphibians, 58 reptiles, 41 resident birds and 40 mammals, which are threatened throughout the country. Among the marine and migratory species of animals 4 fishes, 5 reptiles, 6 birds and 3 mammals are threatened. The Red Data Book on plants, which is still under preparation at Bangladesh National Herbarium, already lists 96 seed-bearing plant species that are threatened.

1.7 Human Responsibility for Biodiversity Depletion

When a population playing a certain role is wiped out, ecosystem services suffer, even if many other populations of the same organism are still extinct.

The popular conception of biodiversity decline is that human rapaciousness and overexploitation are the primary causes of extinctions and hence biodiversity's decline. This is attributable to the fact that when most people consider the causes of known species' extinctions, they usually address them within the context of a few high-profile cases, such as the decline of the great whales or the African elephant. In these contexts,

the focus is usually on human overexploitation of the usefulness of the species (for ivory production, for example) as the cause of the species' endangerment. Alternatively the focus is on the general decline of entire systems, such as erosion of the tropical rainforests. These well-publicized case studies give rise to the general impression that it is human irresponsibility that lies at the core of biodiversity endangerment.

However, when a broader range of species is considered, it is apparent that there are other forces at work as well: exotic incursions and land conversions are two other well-documented forces in biodiversity's decline. Both of these forces are sourced in human choices regarding the introduction of new species and new methods into frontier environments. Humans *choose* to expand their domain by means of converting lands to new uses and to new species, and this continues to result in the contraction of the domain previously available to other uses and other species. When the focus on biodiversity decline shifts to the more abstract level of varietal loss and the decline of agricultural genetic diversity, it becomes even more apparent that the forces at work are sourced in explicit human choices. In the context of the erosion of genetic resources for agriculture, it is underuse of a wider range of resources rather than their overuse which results in the loss of biological diversity. Human societies now make the choices concerning the allocation of lands, water and other resources which determine which of the diversity of life forms will continue to exist. Human *responsibility*, not irresponsibility, should be seen as the underlying cause of the decline of biological diversity. In order to explain the underlying causes of biodiversity decline, we need to develop a general framework that is capable of explaining all of these various examples of biodiversity losses: well-publicized overexploitation and "mining", conversions of lands and agricultural-based changes. The framework developed here will explain all of these various phenomena as consequences of human and societal choices. Human societies should be seen as being fundamentally responsible for all of these various forms of biodiversity decline by reason of their choices regarding the allocation of resources (land based and financial).

It is said after observing the original economic framework utilized to explain over exploitation-based resource depletion, and then goes on to demonstrate how this "irresponsible" behavior may be incorporated within a more fundamental theory of human choice regarding resource allocation and biodiversity depletion. This theory is then developed in order to demonstrate how each of the various phenomena associated with

biodiversity losses (over exploitation, mining and land use conversion) is a proximate cause of biodiversity decline resulting from fundamental human choices concerning the allocation of the resources required for continued survival.

The depletion of biodiversity is are consequences of human and societal choices and that humans should be seen as being fundamentally responsible for all of the various forms of biodiversity decline by reason of their choices regarding the allocation of resources.

1.8 Objectives of the Study

The objectives of the study are as follows:

i. To estimate the present scenario of the biodiversity of Bangladesh;

ii. To identify the causes of depletion of biodiversity;

iii. To promote understanding regarding impact of biodiversity variability and environmental law on livelihood;

iv. To uphold awareness of the impacts and adaptation to environmental change and variability among the communities in the study areas as well as the key national policy markers through dissemination of information and

v. To prepare a set of recommendations that will enunciate the methods of integrating environmental change adaptation into various national actions focused on issues related to eco-zone management.

1.9 Research Structure

The write up of the thesis has been organized into three parts. These are as follows:

a) Primary materials of the research
b) Main part of the research
c) Relevant other materials of the research

a) Primary materials of the research

This part contains the declaration, certified letter, acknowledgement, summary of research, and contents.

b) Main part of the research

There are six chapters contains in this part

Chapter One: Introduction to Biodiversity Conservation

It is the introductory chapters that include Definition of Environment, Present Situation of Environment in Bangladesh, Definition of Key Terms, Description of Biodiversity of in Bangladesh, Present status of Biodiversity, Biodiversity Degredation, Human Respondibility for Biodiversity Depletion, Objectives of the Study, Utility of the Study, Methodology, Review of Literature and Conclusion.

Chapter Two: Identifying the Causes of Biodiversity Depletion in Bangladesh

This chapter contains the Reasons of Depletion of Biodiversity, Diagrammatic Representation of Process Causing Loss of Biodiversity, Case Study on Bio-diversity of Sundarban and its Depletion, Case Study on to Asses the Causes of Bio-diversity Depletion of Chalan beel area, Chronological Reduction of Bio-diversity are discussed in detail.

Chapter Three: **Evolution of Environmental Laws in Bangladesh**

This chapter deals with Historical Background of Environmental Laws in Bangladesh, British Period, Pakistan Period, Bangladesh Period, State of Environmental Laws in Bangladesh, Development of Environmental Laws on Biodiversity in Bangladesh, Development of Agricultural Laws, Development of Fisheries Laws, Development of Wildlife Conservation Laws, Development of Forest Law, Development of Water Resources Management Law.

Chapter Four: International Biodiversity Laws and Global Environment

This chapter discussed about Reo de Janerio (The Earth Summit), UNDP, UNEP and *etc*, Comparative Studies of Environmental Laws (Bangladesh and International.

Chapter Five: Impact of Environmental Laws on Biodiversity Conservation

This chapter analyzes about Violation of Environmental Laws, Violation of River Laws, Violation of Bio-diversity Laws, Violation of Fishery Related Cases, Violation of Forest Laws, Abuse of Law by the Authority, Case Study-on Effects of Exotic Plantation and Its Implication on Biological Diversity of Modhupur Forest, Case Study-on Chokoria Mangrove Forest, Case Study on Hilsa Fish *(Hilsa ilisa)*, Case Study on Brick Fields, Wildlife Consumption and Trade, Frogs: *(Kaloula pulchra)*, Turtles and Tortoises, Snails *(Pila globosa)*, Gharial *(Gavialis ganjeticus)* and Crocodile: *(Crocodylus prosus)*, Royal Bengal Tiger and Mongoose *(Herpestes edwards).*

Chapter Six: Conclusion and Recommendation

This is the concluding chapter of the thesis. It focuses mainly on the summary of the overall findings. Finally, on the basis of the experiences gathered through this research works, some recommendations are placed which will greatly contribute to promote the biodiversity conservation in Bangladesh.

1.10 Utility of the Study

a) In the Field of Legal Education

This research work is very important in the legal field of Bangladesh because to the best of my knowledge there is no academic research on this field. So this research will be the pioneer of the entire academic and research field for Bangladesh.

b) Judicature Sector

Environmental law and practice is a new horizon in the field of judiciary in Bangladesh. It is to be noted that the government has already set up two environmental courts in the country for giving the proper remedies to the affected people in the environmental pollution and disasters. Besides, practice on environmental law is going on in full sewing in the higher court like the Supreme Court of Bangladesh. In this arena this research will be a new addition.

c) Government of Bangladesh

The outcome of the research can play a great significance to the ministry of planning as well as all concerned ministries of environment, agriculture, fisheries, forestry and also can contribute those persons who are working in this sector.

Rule of NGOs

This research can play vital role for promotion and protection of the environment and can offer important insight and guidelines for NGOs and international agencies working inside Bangladesh for the betterment of the environment.

1.11 Methodology

This research based on two sources such as primary and secondary source.

Sources of Data

Primary Source

a) In this research work the direct interview and questionnaire method, *etc*. have used for collecting data from concerned people.

b) Primary sources include the enacted laws, ordinances, conventions, international treaties and case laws collected from different government offices.

Secondary Source

It includes related books, journals (Journals of Bangladesh Institute of International and Strategics Studies, Grass Root Voice, Journal of Institute of Bangladesh Studies, Journal of Islamic University Studies, Asia Pacific Journal on Environment and Development, Journal of BIIS, Journal of Biodiversity and Ecological Science, Bangladesh Bureaes of Statistics, Ministry of Palnning, Electronics Green Journal, Development Policy Review), published dissertations (Laws of Land Reforms in Bangladesh 1950-1984, Ph.D. Thesis, Institute of Bangladesh Studies, University of Rajshahi; Environmental Law and Policy : A Study on Agriculture and Fisheries in Bangladesh, Ph.D. Thesis, Institute of Bangladesh Studies, University of Rajshahi), internet, homepage, *etc*.

Methodology of Research

The completed research prepared a cross sectional descriptive study. In this work qualitative data collected. Findings of the research presented in an analytical description.

Analysis

Biodiversity laws and laws reletated to environment including policies are critically analyzed in aspects of environment. Moreover, the biodiversity laws and policies are also analyzed at the same manner. Descriptive analysis of data and information has been done through analytical methods.

Expected Outcomes

The probable outcomes of the proposed study may explore all the problems and lacuna of the laws and policies and its execution in the research lines and at the same time, this findings may contribute to the policy makers, planners and releted experts, academicians, legislators, lawyers, justice, scholars, researchers for helping them for further research in these lines.

1.12 Review of Literature

For the sake of the research and improvement of the quality of topic, the researcher has gone through the literatures including journals as far as he found out the facts and gaps of the research topic. So far, the researcher has come to know about the topic, there is no research work on this field. But there is a compilation on the environmental enacted laws in the form of textbooks. A few of them are published as an article or report paper. These materials are deeply materialized and explored in order to find out the relevant gaps and deficiencies for the research work. Some of the important relevant literatures are discussed here.

Farooque and Hasan (2004) have focused an excellent book entitled as *Laws Regulating Environmental in Bangladesh*. It seems that it is not a research book but a compilation of the enacted laws related to environment in the country. Their achievement is really praiseworthy. In fact, this book is very helpful the research. This book is a good one as a ready reference. Basher (2004) has published a successful book as Instant Basic of Environment. Though there is no legal issue related to environment in this book nevertheless this book contains vast information about the affection of human lives by environment and environmental science every day. Primack (1993) has published a famous book related to environment as “Essentials of Conservation Biology”. This book refers a fusion of theory, basic research, applied research and public education that is evolving at a peace. Land includes agriculture, irrigation *etc*., to the study. The writer did not deal with all agriculture and fisheries laws and policies in the light of environmental aspects prevailing in the country. Khan (2001) has pointed out some important environmental enacted laws and policies in Bangla version and a few of them are in English version. It is a very recent published book, which will be very helpful for the

research work, but he has explained only 3 or 4 environmental laws and has presented the environment policy, 1992 and Environment Action Plan, 1992 but the rest of the environmental laws are not interpreted in this book. All the information of this book is very clear, unambiguous, and authentic which has made the research work fruitful and will make this research meaningful. Khan (2001) has pinpointed the environmental policies for attaining sustainable environment and management. The writer has presented not only the enter environmental scenarios in its proper perspective but also reviewed of the existing environmental agencies and pointed out the guidelines and prepared the blueprint for the environmental policy planners. But he did not mention and identify the executive mechanisms of the related laws and policies. Ball and Bell (2001) have analyzed the environmental laws, policies and measures in the global aspects but they did not mention any single word about our environmental laws and policies prevailing in Bangladesh. Kafiluddin (2001) has discussed critically in his book entitled *Population Research, Environmental Conservation and Economic Development* about the enter linkages among population, environment and sustainable development but he did not focus any legal aspects on our environmental issues of Bangladesh. Farooque (2004) has given emphasis on the procedural matters relating to the execution of the fisheries laws and policies in Bangladesh. Khan (2004) has written a very popular book on environment is "An Introduction to Environmental Law". This book details out the scientific basis of the problems and examines the feasibility of alternative technologies to control acid rain, green house effect, and depletion of ozone layer.

Gain (2002) has published a details report on the environmental attempts to tell signs of the time with regard to our environment, resources and people of Bangladesh's. Wilson *et al.*, (1990) address in his book ``Biodiversity" offers before us an overall view of the biological diversity and carries the urgent warning that we are rapidly altering and destroying the environments that have fostered the diversity of life forms for more than billion years. Asmat (2001) is written a book in Bangla ``Bangladesh Bilupta Prani" and though there is no law resolution nevertheless this book is very important for having informative discussion about extinct wildlife. A complete particulars and solution of some controversial concept about the extinct wildlife are found in this book with information of

the studies both nationally and internationally. Aziz *et al.*, (2010) has mentioned about the contribution of wildlife with a view to making the people conscious in this book, ``Banya Prani o Tar Babosthapona". This book is written in Bangla and it is riched with root level information related to wildlife management of Bangladesh. Khan (1996) and Khan and Belal (1999) contributes to the development of our environmental studies from the different grounds by writing many books related wildlife. Specifically the book 'Bangladesher Banya Prani' is merely informative as some of which are not found in Bangla. Paul and Sarker (2001) has published a famous book titled as "Biodiversity". This book is very easily presented as the demand of the learners of different colleges and universities of Bangladesh. Students of the Zoology also be benefited besides the students of botany from this book. There are some elaborate discussions about the different part of Biodiversity. Before it there was no published book like it in Bangla on Biodiversity.

1.13 Conclusion

Environmental law on research work is hardly done in Bangladesh. In fact, it is a issue of the national and international arena. It should be studied NGOs partially carried out environmental law research as of demand of the organization if the present situation consequently, there is a very few literature in this line. The International NGOs like UNEP, WHO, UNFPA and national NGOs are working at different aspects of environment. During their study the researcher has searched Bangladesh Environment Lawyers Association (BELA), Bangladesh Poribesh Andolon (BAPA) and other institutions to enquire and consulted with the related persons and all the GO's offices like Parliament Library, Law Commission, Judicial Administration Training Institute (JATI), Ministry of Law, Ministry of Agricultural and Fisheries, the Supreme Court Library and the Supreme Court's Bar Association Library etc, in Bangladesh. After collecting information from these organizations it is illustrated that though there are enough laws in Bangladesh on Biodiversity Conservation but there is a great inadequacy found for the lack of proper implementation and modernization these laws. To find out this inadequacy properly is the main object of this research.

Chapter 2
Identifying the Causes of Biodiversity Depletion in Bangladesh

2.1 Introduction

Many wildlife species have been exterminated in Bangladesh and many more are threatened with extinction. The list of extinct animals of Bangladesh is prepared on the basis of published data and habitat management. The country has lost 10% of its mammalian fauna, 3% avifauna and 4% reptiles over the last 180 years. More than 50 species are critically endangered in Bangladesh of which 23 species are already declared as endangered in the Red Data Book of IUCN (International Union for Conservation of Nature). In addition, 83 species are threatened and are included in the appendices of Convention on International Trade in Endangered Species (CITES). Among them the most endangered species are : Elephant (*Elephas maximus*), Tiger (*Panthera tigris*), Wildcat (*Felis chaus*), Leopard (*Panthera pardus*), Dolphin (*Peponocephala electra*), among mammals; Whitling duck (*Cairina scutulata*), Knobbilled duck (*Sarkidiornis melanotos*), Black partridge (*Perdicula manipurensis*), among birds and Crocodile (*Crocodylus, porosus*) Python (*Python molurus*), Monitor (*Varanus bengalensis*), River Terrapin (*Batagur baska*), Roffed turtle (*Kachuga dhongoka*), Softshell turtle (*Chitra punctata*) and all marine turtle among reptiles. Bird population around the globe is declining at an alarming rate; the primary threats to them are habitat destruction, trade and over hunting (Pocock 1939; Husain, 1974; Husain 1974; Prater; 1980; Khan 1982a, 1985, 1996; Wilson, 1990; Gain, 1997; Asmat, 2001; Gazi, 2004; Basar, 2004; Paul and Sarker, 2001; Aziz *et al.*, 2010).

Despite the depletion of rivers, canal and flood plains for hundreds of year, Bangladesh still holds the worlds most diverse and abundant inland fisheries. But the catch of many popular local species have drastically reduced and many are no more seen. On the migration journey to the flood plains and return journey to the safe sanctuaries the fish face many obstructions and hazards which seriously disturb its reproduction in the open water and ponds. Mistakenly, subsistence fishermen are often blamed for over fishing and thus reducing the fish population.

But the studies and expert opinions do not affirm this blame. The physical loss, shrinkage and modification of aquatic habitats for fish, prawn, turtle and other aquatic organizing are said to be one major factor in depleting the fish varieties.

Grazing, Illegal filling, fuel wood collection uncontrolled and wasteful commercial exploitation are also shown to be causes of depletion of forest resources, with drastically reduced forest, diminishing also are rare wildlife and Biological diversity.

2.2 Reasons of Depletion of Biodiversity

Bangladesh is rich in plant and animal biodiversity. Biodiversity is the total sum of flora and fauna in a given habitat that maintain a balance environment. According to the viewpoints of environmentalists, biodiversity indicates, with regard to frequency of all creatures living on this earth including plants and microorganisms. Presently, biodiversity is affecting due to deforestation, forest exploitations, agriculture and industrial pollution, irrigation and flood control developments, shifting land use and over exploitation of biological resources. Besides, Human beings occupy almost all the earthly land; therefore, the habitats of other lives are seriously hampered.

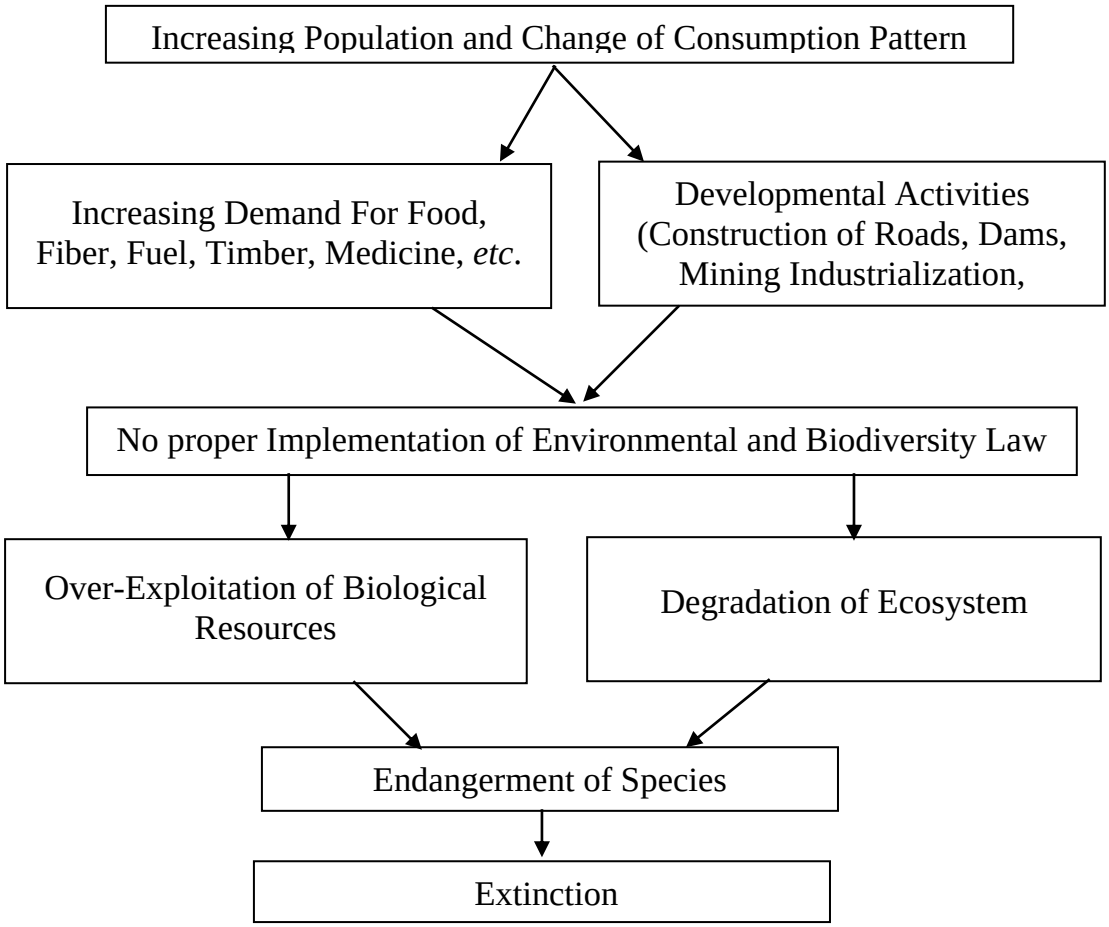
In the name of development work all over Bangladesh, we face serious environmental degradation day by day. Some of the major causes for the depletion of biodiversity in both the terrestrial and aquatic ecosystems (Rahman *et al.*, 2010) are as follows:

- Human interference for agriculture and settlement such as flood control embankments, drainage systems and conversion of inundated lands into crop land have reduced the water area, prevented or altered the seasonal migratory routes of many fishes and reduced breeding and natural stocking of fishes in many water bodies.
- Unsustainable use of Natural Resources
- Hill Clearing, Cutting and Destruction
- Industrial and Agro-Chemical Pollution
- Deforestation
- Illegal Hunting
- Habitats Degradation/Destruction
- Wetland Degradation

- Encroachment
- Traditional Management and Short Sighted Development Efforts
- Introduction of Modern Agro-Technology
- Rapidly Expanding and Heavy Population Pressure
- Indiscriminate Filling of Trees and thereby Reducing tree cover
- Over-exploitation of Particular Species or Resources, like Medicinal Plants, Bamboo, canes *etc*.
- Salinity Intrusion due to Reduced Freshwater flow in the Ganges and its Tributaries is Affecting the Vegetation of the Sundarbans.
- Destruction of the Mangrove forest of Chakaria and Teknaf for Conversion into Shrimp Culture.
- Frequent Occurrences of Natural Disasters, like Floods Droughts, Storms, Cyclones, Tornadoes, Tidal Surges *etc*.
- Industrial, Domestic, Agro-Chemical and other Pollution an Irrational use of Chemical Fertilizers and Pesticides
- Rapid, Unplanned and Uncontrolled Industrialization and Urbanization
- Changing the Character of the Land and Conversion of Low-lying areas to Build up Areas
- Construction of Upland Roads and Homesteads on Wetland
- Increased Salinity Intrusion in the Coastal areas due Lower Flow in the dry Season
- Pollution from Domestic and Agro-Chemical Waste Products and their runoff
- Hunting, Trapping and Disturbances of Animals
- Management of open water Fisheries Through Auction; Ineffective Legal Measures for the Protection of Undersize Fish
- Lack of Adequate Conservation Efforts to Maintain and Protect Indigenous Crop Genetic Resources
- Lack of Software for the Conservation and Propagation of the Various Local Crop Varieties
- Imbalanced Competition Between the Local Varieties Consequent to the Introduction, Adoption, and Promotion of the Exotic and Locally Developed High Yield Varieties (HYV)

- Gradual Encroachment of the Fallow Grazing Lands for Agricultural Crops and thereby Reducing the base for Grass and Fodder Crops
- Regular, Almost Annual, Recurrence of Epizootic Diseases of Cattle and Poultry in some Parts of the Country
- Absence of Trained Manpower, Software and Logistic Support to Contain and Prevent such Recurrent Epizootic
- Long Absence of any Concern for the Production of Fodder Crop and Animal Feed in the Country, Even to the Extent of Exporting Animal Feed Ingredient Like Oil Cake
- Wrongful Dependence on Artificial Insemination from Imported Breeds of Bulls for Improving the Cattle Stock since the 1940s without any Visible Success
- Negligence and Apathy in the Systematic, Identification Selection and Breeding of different local races of Cattle for Improvement.

2.3 Diagrammatic Representation of Process causing loss of Biodiversity



2.4 Case Study on Biodiversity of Sundarban and its Depletion

Introduction

The Sundarbans is the largest compact mangrove forest of the world, located in the estuary of the Ganges covering an area of about one million hectares in south-west of Bangladesh and south eastern state of West Bengal of India.

The Sundarbans is the largest single block of tidal halophytic mangrove forest in the world. The name Sundarban can be literally translated as "beautiful Jungle" or "beautiful forest" in the Bengali language (Sundar, "beautiful" and bon, "forest" or "Jungle"). The name may have been derived from the Sundari trees that are found in Sundarbans in large numbers. Alternatively, it has been proposed that the name is a corruption of Samudraban (Bengali: Samudraban "Sea Forest") or Chandra-bandhe (name of a primitive tribe). But the generally accepted view is the one associated with Sundari trees.

The forest lies in the vast delta on the Bay of Bengal formed by the super confluence of the Ganges, Brahmaputra and Meghna rivers across southern part of Bangladesh and West Bengal of India. According to the view point of English Writer Hunter, Sundarbon is erapted in the largest coastal area Hugli to Meghna which is about 81 miles (Gain, 2005). The seasonally-flooded Sundarbans freshwater swamp forests lie inland from the mangrove forests on the coastal fringe. The forest covers 10,000 sq.km of which about 6,017 sq.km are in Bangladesh. It became inscribed as a UNESCO (United Nations Educational, Scientific and Cultural Organization) world heritage site in 1997, but while the Bangladesh and Indian portions constitute the same continuous ecotype, they are separately listed in the UNESCO world heritage list as the Sundarbans and Sundarbans National Park, respectively. The Bangladesh part of the Sundarbans is estimated to be about 6017sq.km, of which about 1,874 sq.km is occupied by water bodies in the forms of river, canals and creeks of width varying from a few meters to several kilometers and rest of them is land which contains different shorts of trees (Gain, 2005).

The Sundarbans is intersected by a complex network of tidal waterways, mudflats and small islands of salt-tolerant mangrove forests. The interconnected network of waterways makes almost every corner of the forest accessible by boat. The area is known for the eponymous Royal Bengal Tiger (*Panthera tigris*), as well as numerous fauna including

birds, spotted deer, crocodiles and snakes *etc*. The fertile soils of the delta have been subject to intensive human use for centuries, and the eco-region has been mostly converted to intensive agriculture, with few enclaves of forest remaining. The remaining forests, Sundarbans mangroves are important habitat for the endangered Tiger. Additionally, the Sundarbans serves a crucial function as a protective barrier for the millions of inhabitants in and around Kolkata against the floods that result from the cyclones that are a regular occurrence on this coast.

Objective for Biodiversity Depletion

To identify the variegated causes of biodiversity depletion

Methodology for Sunderbans Biodiversity Assessment

The Sundarban Reserve Forest is situated at the southern part of Khulna, Bagerhat and Satkhira civil district lying in between latitude 21° 27' 30" and 22° 30' 00" North longitude 89° 02' 00" and 90° 00' 00" East. Sundarbans is under the administrative of Khulna, Satkhira and Bagerhat districts.

This case study has been conducted primarily based on the field visit in order to collect raw information from the field, also to get proper understanding and insight in the subject. Along with it, we had to depend on the source of information so that historical analysis and comparison can be made and a suggestive attitude can be developed.

To collect the information we have gone through literature stock from Bangladesh Statistical Bauru, Bangladesh Development Studies and other necessary documents found in other sources. After all, documents collection has also been relied on the internet.

History of Sunderbans

The history of the area can be traced back to 200–300AD. A ruin of a city built by Chand Sadagar has been found in the Baghmara Forest Block. During the Mughal period, local kings leased the forests of the Sundarbans to the residents. In this period, Raja Basanta Rai and his 5 nephew took refuge in the Sundarbans from the advancing armies of Emperor Akbar. Many of the buildings which were built by them later fell to hands of Portuguese pirates, salt smugglers and dacoits in the 17th century. Evidence of the fact can be traced from the ruins at Netidhopani and other places scattered all over Sundarbans.

The legal status of the forests underwent a series of changes, including the distinction of being the first mangrove forest in the world to be brought under scientific management. The area was mapped by the Surveyor General as early as 1764 following soon after proprietary rights were obtained from the Mughal Emperor Alamgir-II by the East India Company in 1757. Systematic management of this forest tract started in the 1860s after the establishment of a Forest Department in the Province of Bengal, India.

The first Forest Management Division to have jurisdiction over the Sundarbans was established in 1869. In 1875 a large portion of the mangrove forests was declared as reserved forests in 1875–76 under the Forest Act, 1865 (Act VIII of 1865). The remaining portions of forests was declared as reserve forest in the following year and the forest, which was so far was administered by the civil administration district, was placed under the control of the Forest Department. A Forest Division, which is the basic forest management and administration unit, was created in 1879 with the headquarter in Khulna. The first management plan was written for the period 1893–98.

In 1911, it was described as a tract of waste country which had never been surveyed nor had the census been extended to it. It then stretched for about 165 miles (266km) from the mouth of the Hugli to the mouth of the Meghna and was bordered inland by the three settled districts of the 24 Parganas, Khulna and Backergunje. The total area (including water) was estimated at 6,526 square miles (16,902sq.km). It was a water-logged jungle, in which tigers and other wild beasts abounded. Attempts at reclamation had not been very successful. The characteristic tree was the sundari (*Heritiera littoralis*), from which the name of the tract had probably been derived. It yields a hard wood, used for building, and for making boats, some of which afforded water communication between Calcutta and the Brahmaputra Valley, both for steamers and native boats.

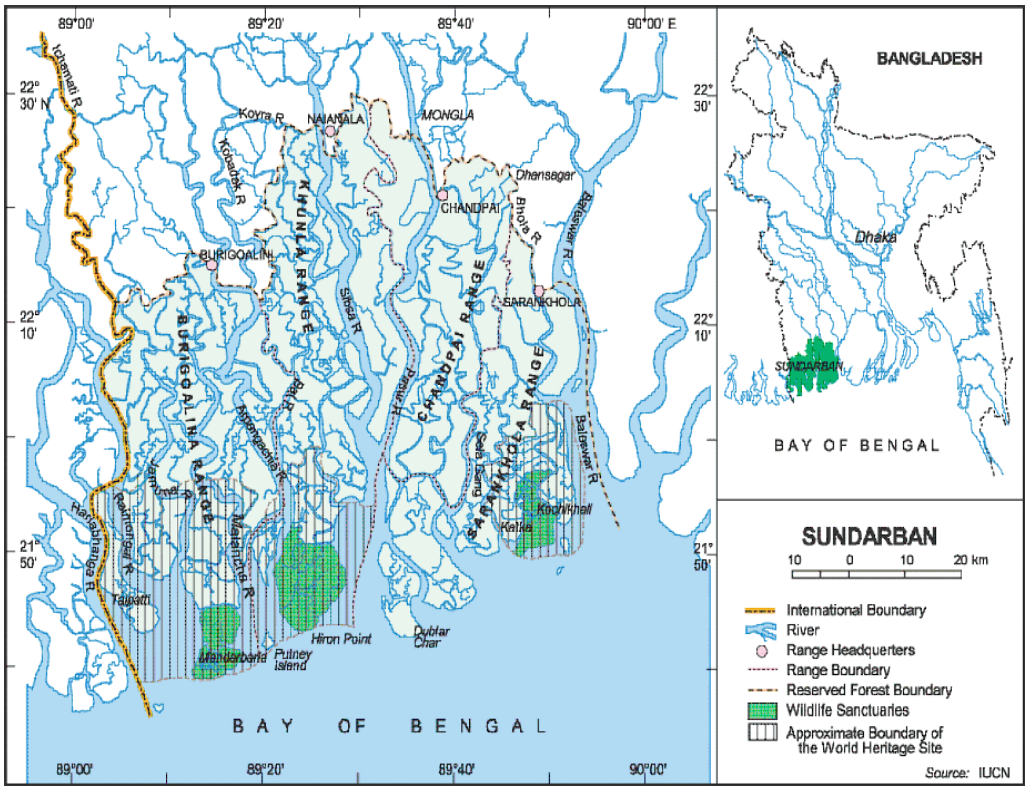
Areas of Sundarbans

Sundarbans is the World largest mangrove forest, 62% in Bangladesh 38% in West Bengal. The area of Sundarbans in Bangladesh is 6017 sk.km. (70% land and 30% water).

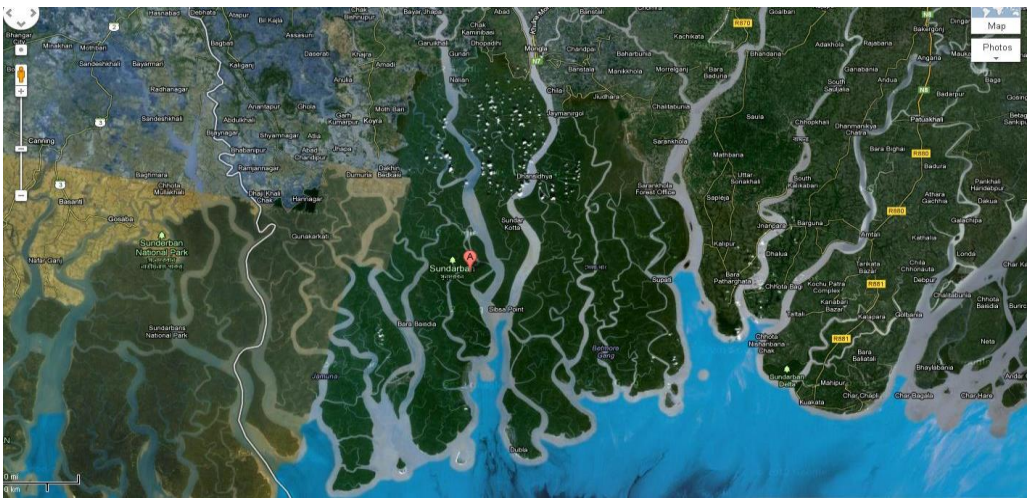
Sundarbans forest is situated on the Southwest coastal areas and it is the largest forest in Bangladesh having 6017sq. miles of areas. The areas 99% covered by the districts of Sathkhira, Khulna and Bagerhat while other areas are in Patuakhali and Barguna districts. Rajmongal and Burishwar stand on the east and west side of Sundarbans respectively.

Location of Sundarbans (Map 1 & 2)

The SRF is situated at the southern part of Khulna, Bagerhat and Satkhira civil district lying in between latitude 21° 27' 30" and 22° 30' 00" North longitude 89° 02' 00" and 90° 00' 00" East.



Map 2.1
Sundarban of Bangladesh



Map 2.2
Sundarbans of Bangladesh (Source: *Google Earth*)

Table 2.1
List of Restricted Khals for Fishing

Ranges	**Name of Khals**	**Compartment No.**
1. Khulna	a) Bhadra	32
	b) Sarbatkhali	32
	c) Mora Bhadra	33
	d) Haddura	33
2. Satkhira	a) Chota keyakhali	46
	b) Bara keyakhali	46
	c) Khalisa Bunia	46
	d) Sapkhali	46
3. Chandpai	a) Karamjal	31
	b) jongra	31
	c) Nandabala	26
	d) Mora Passur	30
	e) Jhapsi	29 & 30
4. Sarankhola	a) Ali Banda	1
	b) Chandeswar	15
	c) Katka	4
	d) Kachikhali	6
	e) Shapla	1
	f) Dasher Varani	24

Rivers of Sundarbans (Table 2.1)

About 450 large and small rivers in Sundarban, Baleswar and Pusur rivers bring fresh water from Padma to Sundarban.

The forest encompasses a land area of 6017sqkm, of which 1874sqkm constitute the river water area. The forest is bordered to the south by the Bay of Bengal while polders and agricultural land border the forest to the north. The western border follows the Raimangal-Harinbhanga Rivers, which also forms the international boundary with India. To the east lies the Baleshwar River and Meghna estuary.

There are rivers and canals spread across this forest like a net with their innumerable branches. Nearly 450 large and small rivers occupy about 1 lakh 75 thousands 685 hectares or about 30 (%) of the Sundarbans. The Biggest River is the Pusur. Other rivers

worth mention are Baleswar, Sibsa, Arpangasia, Bhola, Horinbhanga, Kalindi, Andharmanik, Raimangal, Kapotaksha, Koira, and Shela Bhadra *etc*. As one proceeds to the south, the rivers widen. Some rivers are so wide that one cannot see one bank form the other. Baleswar and Pusur rivers and their tributaries and disrbutaries are connected with the Ganges. As a result these rivers and their branches have flow of fresh water. The sibsa and other rivers in the western part have their source of fresh water only in the Ganges and the northern portion of the Sundarbans depends upon the rainwater. As a result, the fresh water flow in these rivers decreases during the dry season when there is a massive intrusion of saline water. Moreover, the condition of the rivers and canals in the Sundarbans is deteriorating shoals are forming and navigability is declining. River erosion is taking place at some places.

The rivers, canals, creeks *etc*. spread across of Sundarbans like a net with their innumerable branches. There are neatly 450 large and small rivers that occupy the water areas of the Sundarbans. The biggest river is the pasur. Other rivers worth-mentioning are the Baleswar, the Sibsa, the Arpangasia, the Bhola, the Horinbhanga, the Kalindi, the Andharmanik, the Raimangal, the Kapotaksha, the Koira, the Shela Bhadra *etc*. As they once proceed to the south, the rivers become widen.

There are about 102 Islands in the Sundarhans of which some 58 Islands are inhabited. A large number of these inhabitants are directly or indirectly involved in fishing, fry collection or fish marketing *etc.*

Biodiversity of Sundarban

The Sundarban is the largest contiguous block of mangrove forest remaining in the present day world and a large unique mangrove ecosystem, recognized as a site of national and international importance for conservation of biodiversity. This forest is an independent "Biom", enriched with different biodiversities along with a great variety of wild life. Besides dolphins and porpoises, Sundarban mangroves are habitats of many rare and endangered animals (*Batagur baska, Pelochelys bibroni, Chelonia mydas*), especially it is the unique natural habitat of the world famous Royal Bengal Tiger (*Panthera tigris*), Spectacular Spotted Deer (*Axis axis*), Jungle Fowl (*Gallus lafayetii*) and Rhesus Monkey

(*Macaca mulata*). The forest has a unique biota comprising 334 species of plants, 49 species of mammals, as many as 400 species of fish, 315 species of birds and 53 species of reptiles (Rahman and Assaduzzaman, 2010 and Mannan, 2012). Besides numerous species of Phytoplankton, Fungi, Bacteria, Zooplankton, Benthic Invertebrates, Molluscs, Reptiles, Amphibia and Mammals. Species composition and community structure varies east to west, and along the hydrological and salinity gradients. Ecologically, the forest is particularly important as a barrier to cyclones, tidal upsurges. It is also acting as a huge sink of unlimited capacity for absorbing CO_2 and other pollutants from air and water which makes the surrounding environment free from pollution.

The mangroves of the Sundarban are unique when compared to non-deltaic coastal mangrove forest. Unlike the latter, the Rhizophoraceae are of only minor importance and the prime species are sundari (*Heritiera littoralis*), from which the Sundarban takes its name. The reason for this difference is the large freshwater influence in the north-eastern part and the elevated level of the ground surface. The Sundarban can be classified as moist tropical serial forest, comprising a mosaic of beach forest and tidal forest. Of the latter, there are four types: low mangrove forests, tree mangrove forests, salt-water *Heritiera* forests and freshwater *Heritiera* forests. Sundarban west occurs within the salt-water zone, which supports sparse *Ecoecaria agallocha,* a dense understory of Goran (*Ceriops decandra*) and dense patches of Hantal palm (*Phoenix palludosa)* on drier soils. Dhundal (*Xylocarpu granatum*) and Passur *(Xylocarpu mekongennnsis)* and Bakul kankra (*Bruguiera sexangule)* sporadically throughout the area. Sundari (*Heritiera littoralis*), and Gewa (*Excoecaria agallocha*) cover most of the Sundarban but Uridhan (*Oryza coarctata)*, Golpata (*Nypa fruticans)* and Dhanshi (*Imperata cylindrical*) are prevalent on mud flats. Large stands of Keora (*Sonneratia apetala)* are found on newly accreted mudbanks and provide important wildlife habitat.

The Sundarban is the only remaining habitat in the lower Bengal Basin for a variety of fauna1 species. The presence of 49 mammal species has been documented. Of these, no less than five spectacular species, namely Javan Rhinoceros (*Rhinoceros sondaicus)* (CR), Wild Buffalo (*Bubalus bubalis*) (EN), Swamp Deer (*Cervus duvauceli*) (VU), Gaur (*Bos frontalis)* (VU) and probably Hog Deer (*Axis porcinus)* (LR) have become locally

extirpated since the beginning of this century. The Sundarbans of Bangladesh and India support one of the largest populations of Tiger (*Panthera tigris*) (EN), with an estimated approximately 700 (2004). These tigers are well-known for the substantial number of people they kill; estimates range from twenty and eighty people per year. They are the only man-eating tigers left in the world, though they are not the only tigers who live in close proximity to humans.

The varied and colorful bird-life to be seen along its waterways is one of the Sundarbans greatest attractions. A total 315 species of bird have been recorded, including about 95 species of waterfowl and 38 species of raptors. Among the many which may be readily seen by the visitor are no less than nine species of kingfisher, including Brown-Winged and Stork-Billed kingfishers (*Pelargopsis amauropterus*) (NT) and (*Pelargopsis capensis*) respectively; the magnificent White-bellied Sea-Eagle (*Haliaeetus zeucogaster)* which, at a density of one individual per 53.l km of waterways, is quite common; also the much rarer Grey-Headed Fish Eagle (*Zchthyophaga ichthyaetus*) (NT), Pallas's Fish-Eagle; (*Haliaeetus zeucoryphus*) and several other Raptors (*Leptoptillos dubius*) Herons (*Ardeola grayii*), Egrets (*Bubulcus ibis*), Storkas (*Cochoa purpurea*) Sandpipers (*Actitis hypoleucos*), whimbrel (*Numenius phaeopus*) Curlew (*Numenius phaeopus*) and numerous other waders are to be seen along the muddy banks and on the chars or sandbanks which become exposed during the dry season. There are many species of Gulls and Terns, especially along the coast and the larger waterways. Apart from those species particularly associated with the Sea and Wetlands, there is also a considerable variety of forest birds such as Woodpeckers (*Micropternus brachyurus,* mynahs (*Gracula religiosa*), minivets (*Pricrocotus flammeus),* babblers (*Pomatorhinus horsfieldii*) and many others.

Some 53 reptile species and eight of amphibians have been recorded and of these, Mugger (*Crocodylus palustris*) (VU) is now extinct, probably as a result of past over-exploitation, although it still occurs in at least one location nearby. Estuarine crocodile (*Crocodylus porosus)* still survives but its numbers have been greatly depleted through hunting and trapping for skins.

Four species of marine turtle have been recorded from the area, Olive Ridley (*Lepidochelys olivacea*) (EN) being the most abundant. Green turtle (*Chelonia mydas*) (EN) is rare due to excessive fishing, while Loggerhead (*Caretta caretta)* (EN) and

Hawksbill (*Eretmochelys imbricate*) (CR) are not common although there have been some reported on the beaches. River Terrapin (*Batagur baska*) (EN) is also present. The eighteen recorded snake species include King Cobra (*Ophiophagus hannah)* and Spectacled Cobra *(Naja naja*) three Vipers and six Sea-snakes. Over 120 species of fish are reported to be commonly caught by commercial fishermen in the Sundarban. Freshwater species are alarmingly decreased day by day. Crustacean account for by far the largest proportion of animal biomass, with an estimated 40 million kilograms of fiddler crabs and 100 million kilograms of mud crabs. The nutrient-rich waters of the Sundarban also yield a considerable harvest of Shrimps, Prawns and Lobsters. The area supports a varied insect population including large numbers of Ants, Honey-bees *etc*. and honey and beeswax are economically very important products. The insect life of the Sundarban has been little studied.

Climate Change Impact on Sunderbans

The physical development processes along the coast are influenced by a multitude of factors, comprising wave motions, micro and macro-tidal cycles and long shore currents typical to the coastal tract. The shore currents vary greatly along with the monsoon. These are also affected by cyclonic action. Erosion and accretion through these forces maintains varying levels, as yet not properly measured, of physiographic change whilst the mangrove vegetation itself provides a remarkable stability to the entire system. During each monsoon season almost all the Bengal Delta is submerged, much of it for half a year. The sediment of the lower delta plain is primarily adverted inland by monsoonal coastal setup and cyclonic events. One of the greatest challenges people living on the Ganges Delta may face in coming years is the threat of rising sea levels caused mostly by subsidence in the region and partly by climate change.

In many of the Indian mangrove wetlands, freshwater reaching the mangroves was considerably reduced from the late 19^{th} century due to diversion of freshwater in the upstream area. Also, the Bengal Basin is slowly tilting towards the east due to neo-tectonic movement, forcing greater freshwater input to the Bangladesh Sundarbans. As a result, the salinity of the Bangladesh Sundarbans is much lower than that of the Indian Sundarbans. A 1990 study noted that there "is no evidence that environmental degradation in the Himalayas or a 'greenhouse' induced rise in sea level have aggravated floods in Bangladesh"; however, a 2007 report by UNESCO, "Case Studies on Climate Change and World Heritage" has stated that an anthropogenic 45-cm rise in sea level

(likely by the end of the 21st century, according to the Intergovernmental Panel on Climate Change), combined with other forms of anthropogenic stress on the Sundarbans, could lead to the destruction of 75% of the Sundarbans mangroves. Already, Lohachara Island and New Moore Island/South Talpatti Island have disappeared under the sea, and Ghoramara Island is half submerged.

SIDR (Tidal Cyclone): Climate Change Impact on Sunderbans

The first area hit by Cyclone Sidr was Hiron Point and part of the mangrove forest Sundarbans in Bagerhat and Dublar Char Island in Barguna. According to the Bangladesh Meteorological Department, Sidr had a radius of 500 kilometres with the eye of the storm being 74 kilometres and wind speeds of 220-240 kilometres per hour. As the storm moved into central Bangladesh it was downgraded to a Category II tropical storm and is currently in the northeast of the country. The Sidr first hit south-east part of the Sundarbans then moved towards of Bangladesh passing through Barguna. Pautuakhali, Jhalokati, Pirojpur, Bagerhat, Barisal, Bhola, Lakshmipur, Chandpur. Madaripur, Shariatpur, Munshigong, Narayanganj. Dhaka, Comilla, Bramanbaria, Narsingdi, Habigang. Kishoregonj. Maulvi Bazar, Sunamganj and SyIhet.

The flora and fauna of the Sundarbans, became a major casualty of the devastating cyclone. The Forest Department is yet to make an assessment of the colossal losses of wildlife in the Sundarbans.

Sidr damaged 25% of the south eastern part of the Sundarbans. Out the damaged area 7% (ca 30,000 ha) damage was severe l8% (ca.77,000ha) damage was partial. Sidr uprooted and broke severely damaged crown of still standing trees, foliage have been striped off from branches of trees in nearly one third of the Sundarbans mainly including the World heritage Sites, many forest stations, boats, jetties etc have been severely damaged, fresh water ponds have been contaminated by saline water, six out posts have been totally destroyed. Two tigers, 23 deer, I forest staff have been found dead because of tidal upsurge. Residential accommodation of nearly 1000 persons has been badly damaged or washed away. Sundarbans will require years to recover from the damage. Forest Department's official apprehension that the total damage of all kind might amount to US$145 million while Governments official source supports suggest the damage to be US$150 million Forest Departments strategies are to rebuild damaged outpost, revive the safe drinking fresh water, mark and estimate fallen trees and record them by species make fill scale estimation of damage, assist in natural regeneration and plant where necessary.

Aila (Tidal Cyclone): Climate Change Impact on Sunderbans (Table 2.2)

As of 27 May 2009, 330 people have been killed by Aila, and at least 8,208 more are missing, while about 1 million people are homeless. Health officials in Bangladesh confirmed a deadly outbreak of diarrhea on 29 May, with more than 7,000 people being infected and four dying. In Bangladesh, an estimated 20 million people were at risk of post-disaster diseases due to Aila. Damage totaled $552.6 million (2009$). Aila suffering people drinking water searched from a long distance.

Even where efforts have been made to slow the destruction, remaining forests have a number of problems. In some areas, the health and productivity of the forests have declined significantly. The causes of these tragic losses differ from habitat to habitat but are generally tied directly or indirectly to human activities. Individual study is required to determine the most effective remedial measures. Where degraded areas are being regenerated, continued monitoring and thorough assessment must be done to help us understand the recovery process. This knowledge will help us develop strategies to effectively rehabilitate degraded mangrove habitats in the Sundarbans Forests.

Table 2.2
Damages of Aila in Different District

Districts	Affected population	No. of deaths	People took shelter	Damaged crops (Acre)
Barisal	367895	7	173225	122591
Bhola	270983	12	173225	16157
Pirojpur	248470	1	30000	55107
Patuakhali	615785	8	39400	97998
Borguna	284079	0	78500	89280
Jhalokathhi	213860	0	0	3357
Khulna	494900	35	109000	5834
Bagerhat	234237	2	162700	2643
Satkhira	595122	32	119337	559
Chittagong	12523	1	4148	146
Cox's Bazar	29795	2	13700	0
Laxmipur	12371	7	21030	5021
Feni	40000	0	2600	496
Noakhali	49244	24	36200	1500
Total	3469264	131	963065	400689

Salinity and Sea Level Rise Threaten on Sundarban

Natural resources of the Sundarbans, especially various kinds of trees, are seriously threatened due to the rise of sea level and salinity caused by climate change. The low areas of the world's largest mangrove forest, declared a World Heritage site by UNESCO, are flooded by tidal waters every year due to rise of sea level and excessive silt deposit that cause diseases and deaths to various kinds of trees. Many diseases, including 'Agamora' (top dying), affect different species of plants and trees, including the Sundari tree (*Heritiera littoralis*), in the Satkhira Range of the Sundarbans.

As the forest department has not yet taken any preventive measures to save the trees and plants, the diseases have been spreading, causing many species of valuable trees to die. Besides, rising salinity in rivers, canals and other water bodies in the mangrove forest was also one of the reasons for the death of trees.

Sources at the forest department research centre said the quantum of salinity in the rivers and canals in the Satkhira Range of the Sundarbans is 27-33 PPT against the accepted level of 5-10 PPT. While visiting different areas of the forest, this correspondent found a wide variety of trees, including Sundari (*Heritiera littoralis*), Passur *(Xylocarpu mekongennnsis)* Keora (*Sonneratia apetala*), Gewa (*Excoecaria agallocha*), Baen (*Avcennia officinalis*), Goran (*Ceriops decandra*), Hantal palm (*Phoenix palludosa),* Dhundal (*Xylocarpu granatum*), Bet (*Calamus tenuis*), Jhau (*Tamarix galica)* and Hogla (*Typha elephantiana*) affected by 'Agamora' (top dying) disease, causing death to many trees while many became reddish.

Not only the trees and plants, but also many species of animals and birds have been facing extinction due to salinity on the ground. The concerned departments of the government, however, have not taken any action to protect the bio-diversity of the forest. A forest research station was established in 1994 in Munshiganj of Shyamnagar Upazila, adjacent to the Sundarbans, with one station office having one nursery supervisor, one guard and two boatmen. But what research activities the station was engaged in could not be ascertained.

Endangered and Extinct Species of Sunderbans

The endangered species that lives within the Sundarbans are Royal Bengal Tiger (*Panthera tigris*) Estuarine Crocodile (*Crocodylus prosus),* River Terrapin (*Batagur baska*), Olive Ridley Turtle (*Lepidochelys olivacea*) (EN) Green turtle (*Chelonia mydas*) (EN), Gangetic Dolphin(*Platanista gangetica),* Hawks Bill Turtle (*Eretnochelys imbricate)* and King Crabs (*Horse shoe*). Some species such as hog deer (*Axis porcinus),* Wild buffalo (*Bubalus bubalis*), Swamp Deer (*Cervus duvauceli*), Javan Rhinoceros (*Rhinoceros sondaicus*) and the Mugger Crocodile or Marsh Crocodile (*Crocodylus palustris*) have become extinct in the Sundarbans at the beginning of the last century. There are several other threatened mammal species, such as the Capped Langur (*Semnopithecus pileatus*), Smooth-Coated Otter (*Lutrogale perspicillata*), Oriental Small-Clawed Otter (*Aonyx cinerea*), and Great Indian Civet (*Viverra zibetha*). According to the survey of 1940, Leopard (*Panthera Pares*) was available in the Sundarbon but now it is not found (Khan, 1996).

Illegal Practice of Sundarban Biodiversity

The total area of Sundarban in Bangladesh is calculated about 5800 sq.km including rivers and Canals. Wild species such as wild buffalo, Bengal Rhinoceros, Swamp deer have already become extinct from this forest. About two species of amphibians, fourteen species of reptiles, twenty five species of birds, five species of mammals have now become extinct from the Sundarban. Some natural phenomena and human interventions are the main causes in this regard. There are about 334 species of trees including vegetation, creepers, and harbs are available in the forest. Peoples are authorized with legal endorsement in the forest to catch fish, collect honey, Golpata and Gewa tree and there are frequent illegal trespassers among them who collect the natural resources indiscriminately.

There are many valuable trees in the Sundarban which should be preserved to save the ecosystem and biodiversity of Sundarban. But unfortunately the ecosystem and biodiversity of Sundarban is damaging day by day because of illegal activities trough the Sundarban. Sundarban is being a crime zone day by day and it is using as safe zone to the criminals. A few groups of terrorists are placed in Sundarban and the they are doing crime in the surrounding area. Criminals loot the locals and hand over the valuable trees to the

black market. Stealing is a common practice in Sundarban by which Sundarban is losing its valuable assets day by day. Anthropogenetic impacts like reclamation, human encroachment and influence plays a vital role to increase the depletion of biodiversity of Sundarban. High salinity, low water table and acidity problem, loss of soil fertility, coastal erosion and a steep fall in fishery resources, conversion of mangrove tracts for aquaculture and agriculture Extension of other non forestry land use into mangrove forest, uncontrolled collection of prawn seedling, pollution from both the landward and seaward sides are also the illegal practice in Sundarban. Hunting different kinds of valuable animal like tiger, deer, crocodile, birds, snakes *etc* is the most affective illegal practice in Sundarban which are seriously damaging the ecosystem of Sundarban.

Depletion of Biodiversity in Sunderbans

The bio-diversity of the Sundarbans has been under threat for various reasons. There has been increasing conversion of the forest land for agriculture, mainly for paddy and shrimp farming and for human habitation. The forest's bio-diversity is also threatened by unabated poaching, hunting, illegal felling of trees, exotic plant plantation diseases, unplanned and over extraction of resources, insufficient conservation effort, deterioration of law and order situation, corrupt practices of the forest officials and unscrupulous traders *etc*. Poverty population pressure and encroachment by the forest/local people are blamed for the depletion of bio-diversity in the Sundarbans. Contrary, to this customary belief, plundering and exploitation of forest resources by the poachers and dacoits in connivance with the corrupt forest officials are said to be the main causes of forest loss in the Sundarbans. Recurrent natural calamities like storms, cyclones and tornadoes pose a big threat to tall slender trees, which act as a barrier against the cyclones and tidal surges originating in the sea. More than a dozen of cyclones have hit the Sundarbans during the last decade. A disastrous cyclone at Dublar Char in 1988 devastated the forests and the fishermen's villages.

Besides these anthropogenic activities and natural calamities, some ecological changes like increase in salinity, outbreak of diseases like "top dying" of the Sundari trees pose a serious threat to rich biodiversity of the Sundarbans. Such diseases are taking a heavy toll of the wood lots in the Sundarbans. Actual cause of the disease is not yet known. Diversion of the natural courses of rivers, construction of embankments, dams and

bridges in the upstream as well as decreased flow of freshwater in the rivers resulted in the increase in salinity level and over-silting in many places and caused subsequent changes in the mangrove ecosystem. Increased salinity and siltation within the forest area may hinder the biological functions of the breathing roots and are supposed to the major causes of top dying of the trees. Possibility of fungus pathogens can not be overlooked. In the Sundarbans, for bringing non-commercial cover areas under tree cover in different areas of Chandpai, Sarankhola and Khulna forest ranges, plantation of exotic species, like *Acacia nilotica, Alibizia procera* have taken place. Though at a limited scale, many other exotic species have been introduced in the Sundarbans mangrove ecosystems, particularly in areas around the forest offices. It is apprehended that these exotic species may pose a threat to the native variety of mangrove species.

Dey, 2001 reported that Wild Buffalo, 2 species of Deer, Javan Rhinoceros extinct and presently 2 species of amphibians, 14 species of reptiles 25 species of birds and 5 species of mammals are considered as endangered species.

Causes of Depletion of Biodiversity of Sundarban

1. Anthropogenic Impacts like Reclamation, Human Encroachment and Influence;
2. Geomorphic stress caused by the neo-tectonic tilting of the Bengal Basin
3. Recurrent Coastal Flooding due to Climate Change (Global Warming), Changes in Sea Level (Raise in Sea Level)
4. Huge silt Deposition, Biodiversity Loss and Regeneration Problems of Obligate Mangrove Plants
5. High Salinity, Low Water table and Acidity Problem, Loss of Soil Fertility, Coastal Erosion and a Steep fall in Fishery Resources
6. Reduction in the Periodicity and Quantity of Freshwater Reaching the Mangrove Environment due to Diversion of Freshwater in the Upstream Areas (especially due Farakka Barrage Constructed by India) and Change in Course of main rivers
7. Conversion of Mangrove Tracts for Aquaculture and Agriculture
8. Extension of other Non-Forestry Land use into Mangrove Forest
9. Increasing Demand for Timber and Fuel Wood for Consumption
10. Poaching of Tiger, Spotted Deer, Wild Boar, Marine Turtles, Horse Shoe Crab *etc.*
11. Uncontrolled Collection of Prawn Seedlings

12. Uncontrolled Fishing in the Water of Reserve Forests
13. Continuous Trampling of River/Creek Banks by Fishermen and Prawn Seed Collectors
14. Pollution from both the Landward and Seaward sides through Marine Paints, Hydrocarbons, usage of Excessive Pesticides, Chemicals for Agricultures, Industries, Exploitation of Mineral Gas and Oil *etc.*
15. Organizational and Infrastructure Deficiencies;
16. Lack of Public Awareness

Study on the search of appropriate cause of biodiversity depletion in Sunderban region has provided an insight which is in need of immediate implementation. Such as the conservation attempt by the government must be accentuated by the local people. This can be materialized by managing alternative employment opportunities of those whose livelihood rests on Sunderban and by developing sustainable management procedure which will replenish the loss of resources for the local livelihood sustenance.

Secondly, the most troublesome cause that has been identified by our study is climate change impact. Recent cyclone like SIDR, AILA has devastated the entire region by striking on the long trees and by depleting the wild animals, even the tiger has been found dead after the disaster. Hence, an intensive and immediate measure is to be taken so that a proper strategy can be put in place before any such calamity strikes soon.

2.5 Case Study on to Asses the Causes of Biodiversity Depletion of Chalan beel area

Introduction

The rich biodiversity of Bangladesh is a valuable heritage of our present and future generations. Its value goes beyond the local context; it has a global significance. Over the last hundreds years, the country has lost about 10 percent of its biodiversity. Population pressure, habitat loss, pollution, and poaching are putting tremendous pressures on the existing biodiversity. If the current trend continues, many of the species will be endangered or be even extinct. In case of `Chalan beel" these percentage of lost is near about 3%. The condition of wetlands is even worse than that of forests. Most of the wetlands are being converted into agriculture land and degraded due to development activities.

Objectives

Main objectives of the visit were:

i) to observe biodiversity of this area
ii) to find out the causes of depletion of biodiversity
iii) to observe the social and economical condition of the visited area
iv) to find out the pathway to improve the ecological condition.

Research methodology of Chalan beel Observation

Required data were collected by side observation and interviewing the local people. There is no any specified or appropriate analytical method was used to analyze the collected environmental data. So collected data were tabulated and arranged, according to the researcher choice for achieving the objectives of the study.

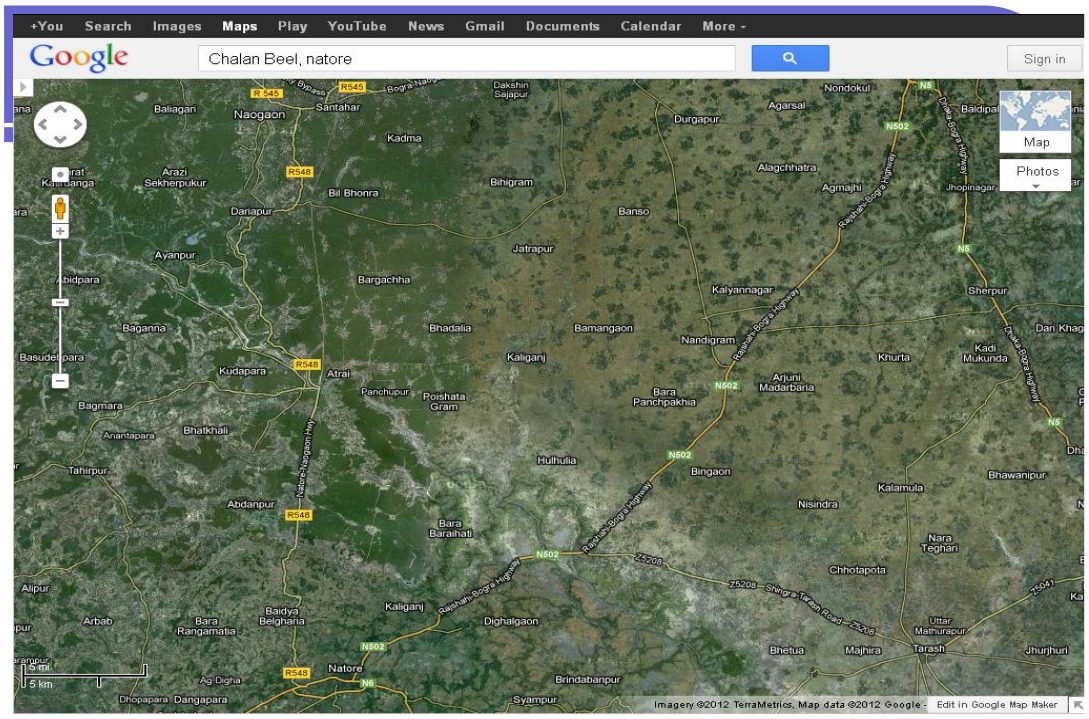
Project Description of Chalan beel Area

In the morning on 06.03.2007 I went to the visited area and observed a social, economical and environmental condition, from Institute of Environmental Science (IES) to project area Chalan beel, I observed all things on the way related to the study, the observations are stated below.

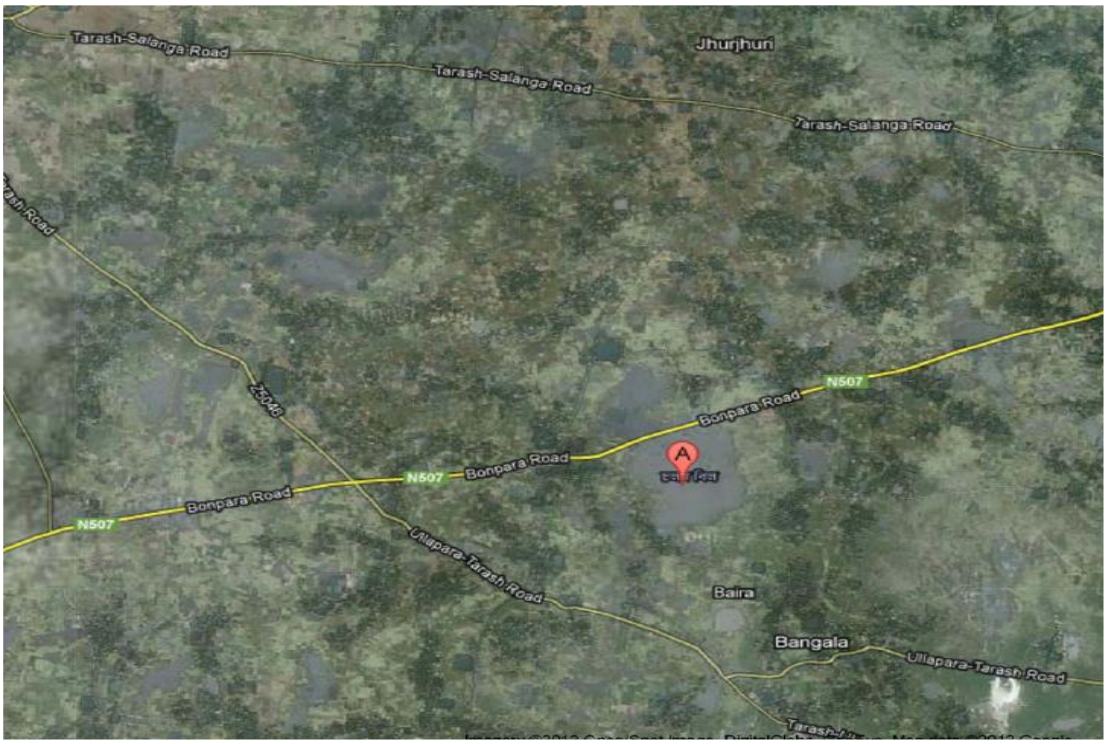
Location of Chalan beel (Map 2.3 & 2.4)

Chalan beel is the largest wetland, water body and natural water reserver in Bangladesh. It covers the area of eight upzilas of three districts, namely Natore, Sirajgonj and Pabna. Singra, Boraigram and Gurudaspur of Natore, Taras, Raigonj and a part of Ullapara of Sirajgonj, Chatmohor and Vangura of Pabna districts come within the range of Chalanbeel. It is some 2000 square kilometers in its size, 51 kilometers in length (east-west) and 39 kilometers in its width (north-south).

Once it stretched from Raninagor, Atrai of Naogan to Faridpur, Bera and Sador of Pabna, as well as Nandigram and Adamdighi of Bogra district. But now it has diminished in its size owing to siltation. The construction of highway has also had a negative impact on its size.



Map 2.3
A partial Map of Chalan beel (Source: goole earth)



Map 2.4
Bonpara Bipass Highway Road and Ullapara-Tarash Road in Chalan beel (Source: goole earth)

Physical Feature and Topography of Chalan beel

The topography of the land is low. The area is about 25 meters high from the sea levels. The area is under Agro Ecological Zone (AEZ) named High Ganges River Flood plain. There is an overall pattern of olive-brown silt loams and silty clay loams calcareous soils. Organic matter content in the soil is low. Soils are slightly alkaline in reaction. General fertility level is very high.

Climate and Temperature of Chalan beel Area

The climate of this area is mainly warm and moist also. In terms of moisture chalanbeel resembles Rajshahi. The temperature of this region is on average from maximum 35^0C to minimum 25°C. In winter it is from 12^0C to 15^0C. Sometimes it increases to 45^0 C in summer and decreases 14^0 C.

Area and Population in the Observation Area

In 1909

A survey carried out in 1909 by the then-Public Works Department (PWD) found the original area of the *beel* was about 1088 km^2.

Present

Its reduction to its current area of 375 km^2 is a consequence of the above-noted drainage and watershed changes.

The study area is less populated than other parts of Bangladesh. About 1749484 people live here in 64 union councils, 7 municipalities, and 1878 villages. Average family size is 6, literacy rate 40 and 37.36 male and female respectively. About 82% population is Muslim, 16% Hindus and others 2%.

Main Part of Chalan beel

The main constituent beels of Chalan beel are, from west to east: (1) Purba Maddhanagar, (2) Piprul, (3) Dangapara, (4) Laror, (5) Tajpur, (6) Niala, (7) Chalan, (8) Majhagaon, (9) Briasho, (10) Chonmohan, (11) Satail, (12) Khardaha, (13) Darikushi, (14) Kajipara, (15) Gajna, (16) Bara, (17) Sonapatila, (18) Ghugudaha, (19) Kuralia, (20) Chiral, (21) Dikshi and (22) Gurka. The big-size depressions (beels) are mostly in

Pabna district. They are: Gajna, Bara, Sonapatila, Ghugudaha, Chiral and Gurka. Gajna beel comprises an area of 123 sq km, and is located to the south of Dulai. Bara beel covers an area of 31 sq km. Sonapatila beel lies in the northern part of Pabna and has an area of 35 sq km. Kuralia and Dikshi beels cover areas of 18 and 15 sq km respectively; both are in Chatmohar upazila. Chiral and Gurka beels cover an area of 8 sq km each and Ghugudaha beel is 4 sq km in size.

Occupation of the People

About 10,000 families live on fishing and this number increases to the number of 30,000 in the rainy season. A great number of families depend on farming, business and other occupation.

Road and Communication

As it is a lower wetland, the modern communication system has not developed even in this scientific age. Boats and carts are still the main mode of transport and communication. Though a number of upzilas and districts are linked with metalled and semi-metalled roads and streets, no particular improvement could be found in communication. Natore-Nagorbari highway, Bogra-Natore Bogra-SirajgonjI highway and recently built Hatikumrul, Bonpara-Dhaka highway have contributed greatly to the development of the people of this area.

Rivers of Chalan beel

Atrai, and Gour, Karatoa and Fulzhor, Boral, Barnoi, Tulsi, Chechua, Vadai, Chiknai, Bangonga and Khubjipur Telkupi are of the main rivers of this area.

Table 2.3
Constructions on Boral River in several times

No.	Locations	Construction Year	Construction Agency
01	**Charghat Sluis Gate, Rajshahi**	1985	Water Development Board
02	**Ramnagar Dam, Chatmahar**	1986	Up-Zilla Parishad
03	**Bodhar Dam, Chatmahar**	1987	Up-Zilla Parishad
04	**Natun Kheya Ghat, Chatmahar**	1988	Up-Zilla Parishad
05	**Dohopara Sluis Gate, Chatmahar**	1988	Up-Zilla Parishad

Table 2.4
Different waterbodies under Chalan beel and their area

Type of water body	Number	Dry season Area (ha)	Monsoon Area (ha)
Rivers	21	709	3300
Beels	93	2227	9164
Floodplain	-	-	22 369
Ponds	12 817	2293	2617
Borrow pits	214	–	50
Total	-	5229	37 500

This study; Upazila Fisheries Offices (2006).

Socio-Economic Status

Socio-economic condition of the people are not good in respect to other places of Bangladesh, But in my opinion it was found that many people are living their lively hood below the poverty line.

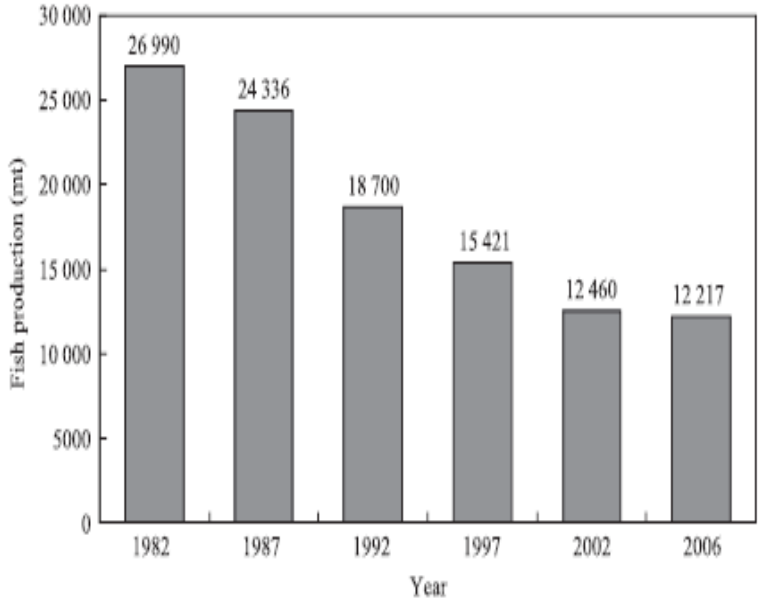


Figure 2.1
Fish Production Trends in Chalan beel from 1982 to 2006

List of Animal Diversity

Chalan beel is the heaven of fish. The number of fishermen family in this area is 10000 in dry season and 30000 in the rainy season. The fish hunters freely collect their fish in the marshes and flooded land of the area.

Every year 12,255 metric tons of fish are caught only in the rainy season and thereby some 72 crores 2 lacs 55 thousand tk at tk. 60 per kg is earned every year. The amount of fishes can meet the demands of the local people and can be exported to other regions of the country as well. The availability of the agricultural and fishing land of Chalan beel and the surrounding is decreasing day by day due to increased demands of settlements.

Fishes of Chalan Beel

A total of 81 fish species were recorded from Chalan Beel including 72 indigenous fish species and nine exotic species. Native fishes were recorded under following 12 fish orders- Cypriniformes (33.33%), Siluriformes (29.17%), Perciformes (13.89%), Channiformes (5.56%), Mastacembeliformes and Clupeiformes (4.17% each), Osteoglossiformes (2.78%), Cyprinodontiformes, Anguilliformes, Synbranchiformes, Beloniformes and Tetraodontiformes (1.39% each) (Kostori *et al*., 2011). Among the availableindigenous fishes, 38.89% fishes were in the list of threatened fishes of Bangladesh declared by IUCN. In addition to fishes, small freshwater prawns, crabs and some other fisheries items were very common in Chalan Beel.

The Available Fish in this Area are as follows

Mola, (*Amblypharyngodon mola*), Bele (*Awaous grammepomus*), Bailla (*Awaous guamensis*), Baghair (*Bagarius bagarius*), Bata (*Bangana ariza)*, Tengra (*Batasio batasio*), Tengra (*Batasio tengana*), Katol (*Catlacatla*), Lombachanda (*Chandanama*), Guratengra (*Chandramarachandramara*), Gozar (*Channamarulius*), Gachua *(Channaorientalis*), Taki (*Channapunctata*), Shol (*Channastriata*), Hatchetfish (*Chela cachius*), Chital *(Chitala chitala*), Mrigal (*Cirrhinus cirrhosus*), Koi (*Clarias batrachus*), Kachki (*Corica soborna*), Olive danio (*Danio dangila*), Banspata (*Devario devario*), Bhut bele (*Eleotris fusca*), Darkina (*Esomus danricus*), Muri bacha (*Eutropiichthys muriu*), Rivercatfish (*Eutropiichthys vacha*), Gang tengra (*Gagata cenia*), Catfish (*Gagata youssoufi*), Ghor poa (*Garra annandalei)*, Bele (*Glossogobiusgiuris*), Kani tengra (*Glyptothorax cavia*), Chapila (*Gonialosa manmina*), Shingi (*Heteropneustes fossilis*), Angra labeo (*Labeo angra*), Bata (*Labeo bata)*, Ghonia (*Labeo boggut)*, Kalibaus (*Labeo calbasu*), Ghora mach (*Labeo dyocheilus*), Baitka (*Labeo pangusia*), Rui (*Labeo rohita*), Chep chela (*Laubuca laubuca*), Gutum (*Lepidocephalichthys annandalei*), Puiya (*Lepidocephalichthys berdmorei*), Tara baim (*Macrognathus aculeatus*), Baim (*Mastacembelus armatus*), Along (*Megarasbora*

elanga), Kuchia (*Monopterus cuchia*), Gangatic mystus (*Mystus cavasius*), Nodoi *(Nandus nandus*), Batasi (*Neotropius atherinoides*), Chital (*Notopterus notopterus*), Kani pabda (*Ompok bimaculatus*), Madhu pabda (*Ompok pabda*), Pangas (*Pangasius pangasius*), Ranga chanda (*Parambassis ranga),* Snake eel (*Pisodonophis cancrivorus*), Gang magur (*Plotosus canius*), Punti (*Puntius chola),* Kanchan punti (*Puntius conchonius),* Shorpunti *Puntius sarana*), Bhadi punti (*Puntius sophore*), Tit punti (*Puntius ticto*), Bhol (*Raiamas bola*), Darkina (*Rasbora rasbora),* Khorsula (*Rhinomugil corsula*), Rita (*Rita rita),* Chela (*Salmophasia acinaces*), Chela (*Salmophasia bacaila),* Chela (*Salmophasia phulo*), Savon khorka (*Schistura savona),* Phasa (*Setipinna phasa),* Ayre (*Sperata aor*), Tepa (*Tetraodon cutcutia*), Potka (*Tetraodon fluviatilis*), Khailsha (*Trichogaster fasciata*), Lal kholisha (*Trichogaster lalius*), Boal (*Wallago attu*), Kakila (*Xenentodon cancila*) Other animals living in this area are Cattle (*Bos primigenius*), Fox (*Vulpes bengalensis*), Wildcat (*Felis chaus*), Ud Biral (*Lutra lutra*), Mesobagh (*Felis viverrina*) *etc.*

Twenty six fish were used for drying including five major fish species for large scale drying and remaining species were mixed with major species, mostly of damaged physically. Majority (89.3%) dry fish farmers brought raw fishes from local fish markets or landing centers. Washing of raw fish was done by beel water and poor quality salts were used for salting (rate: 50-250g/kg fish) in most cases (Samad, *et al.,* 2009). Majority drying were done by spreading raw fishes on bamboo rack without any protection measure from insects or dust.

Among birds are as follows:

(i) Native Birds of Chalan beel

Balihas (*Nettapus coromandelianus*), Chokha Chokhi (*Tadorna ferruginea*), Manikjor (*Ciconia episcopus*), King Fisher (*Alcedo atthis*), Tiya (*Psittacuua krameri*), Kokil (*Eudynamys scolopacea*), Bokkodal (*Platalea leucorodia*), Tilagugu (*Streptopelia chinensis*), Gang Salic (*Acridotheres ginginianus*), Fishing Eagole (*Haliaetus leucoryphus*), Babui (*Ploceus philippimus*), Kana Bok (*Ardeola grayii*), Pankori (*Phalacrocorax niger*), Crane (*Grus antigone*), Dahuk (*Amaurornis phoenicurus*), Kora (*Gallicrex cinerea*), Sada Bok (*Egretta garzetta*), Choroi (*Passer domesticus*) *etc.*

(ii) Migratory Birds of the Chalan beel Area

Titihas (*Anas platyrhynchos*), Pamtamukhy (*Anas plapeata*), Lenja has (*Anas acuta*), Chiti has (*Anas platyrhynchos*) *etc.*

List of Plant Diversity in the Study Area

Paddy is the only crop because the depth of water in the rainy season is 6/7 meter.

Though the region is farmed only once, 51 thousand 30 metric ton is produced in 1 lac 20 thousand hector lands, 50% of the total products are transport to other regions of the country. Once Amon, Aus and Boro were the main type of paddy which was produced in this area but at the advent of IRRI (International Rice Research Institute) the farmers are getting benefited. In the relatively highland of this region some other crops are also produced. These include Wheat (*Triticum aestivum*), Onion (*Allium cepa*), Garlic (*Allium stivum*), Black gram (*Vigna mungo)* and vegetables.

Among the fruits are as follows

Mango (*Mangifera indica),* Jujube (*Ziziphus zizyphus),* Wood apple (*Aegle marmelos),* Elephant apple(*Dillenia indica),* Golden apple (*Spondias cythereal),* Black berry (*Rubus fruticosus),* Amloky (*Phyllanthus emblica),* Dalim, (*Punica granatum),* Jamrul (*Syzygium samarangense),* Jackfruits (*Artocarpus heterophyllus*), Lichi (*Litchi chinensis*), Papaya (*Carica papaya),* Banana (*Musa spp.*), Cucumbers (*Cucumis sativus),* Coconut (*Cocos nucifera),* Guava (*Psidium guajava*), Makhna (*Euryale ferox salis*), Saluk (*Nymphaea capensis),* Sada Sapla (*Nymphaea nouchalli*), Paddo (*Nelumbo Nucifera*).

At present in different regions of Raigonj, some parts of Boriagram, and west part of Gurudaspur a huge amount of Garlic (*Allium stivum*), are being grown. Lichi (*Litchi chinensis),* is also being farmed in Nazipur of Gurudaspur nowadays.

Results and Discussion

Sustainability of agriculture is now a major global concern. In the study area the Sustainability of Chalan beel and the its surrounding is serious concern in the fact of lac of proper designing and planning of land use as a result, declining yield of agricultural production, fishing for increasing population.

The availability of the agricultural and fishing land of Chalan beel and the surrounding is decreasing day by day due to increased demands of settlements, roads and other non-agricultural uses. The crop yield has to be increased by using scientific land use planning, suitable crops selection, cropping patterns, used balanced fertilizers, pesticides, and other essential management practices. With the introduction of modern production systems, farmers disregard the traditional cropping practices such as mixed cropping, crop rotation and intercropping. Monocropping along with imbalanced use of inorganic fertilizers, pesticides, and intensive use of land without application of organic fertilizers have led to deterioration of soil quality and fertility of the study areas.

Depletion of Biodiversity

As is the case with other parts of the country, the dam of Farakka is inevitably reducing the inflow of water in Chalan beel. As a result the diverse animal life in Chalan beel is heel is being obstructed in their movement.

Construction of railroads and a number of highways has greatly barred the free movement of the fishes and other water animal. The reproduction process of certain fishes and water animal are being hindered due to the railroads and highways. As a result some of the species of fish like Nodoi (*Nandus nandus*), Sarpoti (*Puntius sarana*), Bacha (*Eutropiichthys muriu*), Bata (*Bangana ariza*), Pangas (*Pangasius pangasius*), Pabda *(Ompok pabda)* are becoming extinct. Even the water animals like Ud Biral (*Lutra lutra*), Mesobagh (*Felis viverrina*) have also become non-existent.

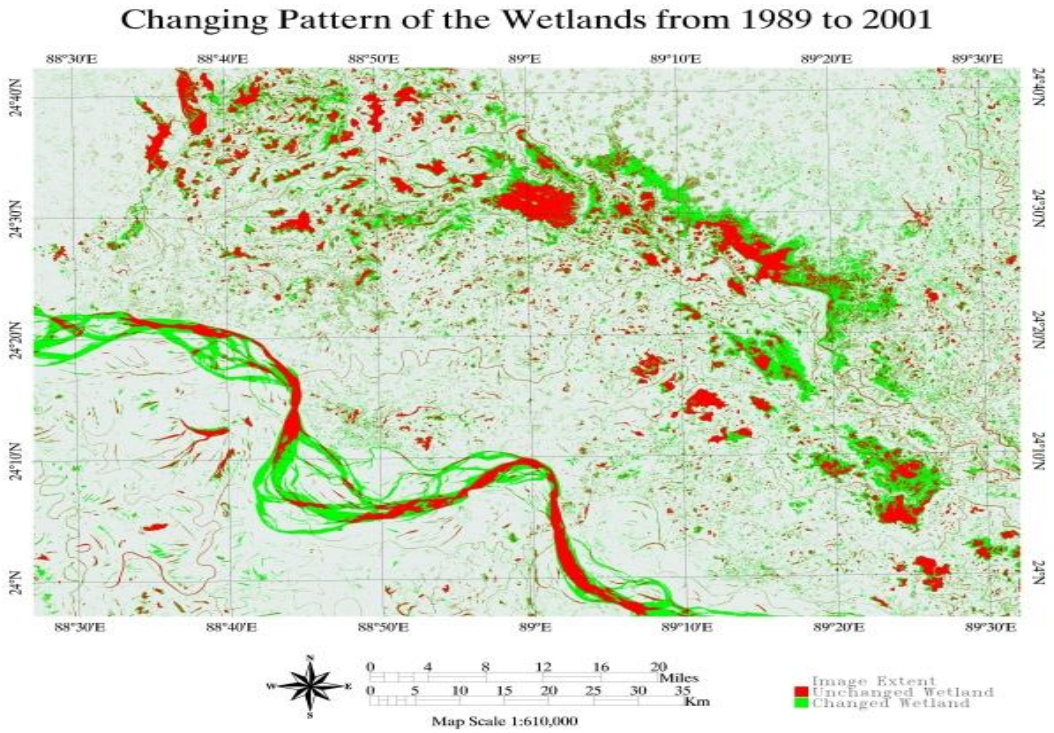
Closure of water movement use to Farakka and its resultant negative effects on the fertility compels the farmer of this area to use chemical fertilizers on their lands to increase the production. But though the practice of fertilizing leads to a greater production of crops, it ultimately affects the biodiversity negatively. Life of the fishes and other animal's dependent on the water of this region becomes a victim to the large amount of pesticides used by the farmers in this area.

Land Degradation of Chalan beel (Map 2.5 & 2.6)

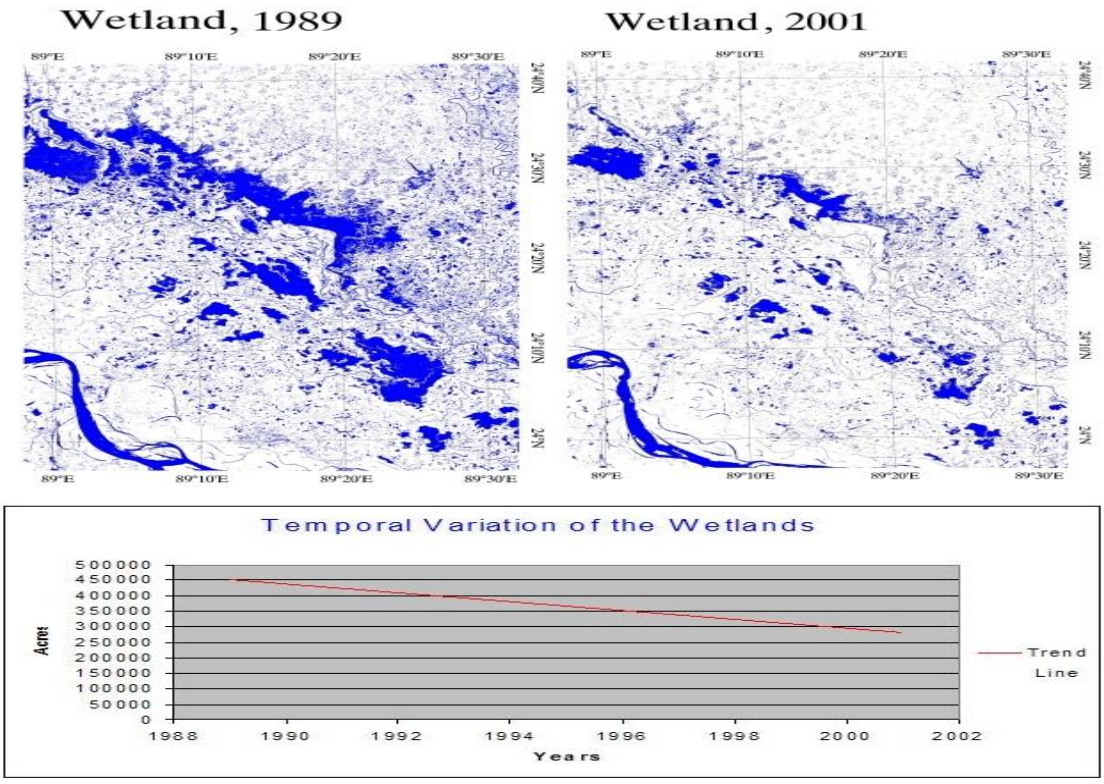
Poverty with rapid population growth of Chalan beel area, absence of a proper land use policy, and other driving forces compel people in Bangladesh to over-exploit natural resources like land, which forms a major focus for human economic activities. The functional capabilities of the soil have deteriorated due to unbalanced use of agrochemicals, unplanned land use, encroachment on forest areas for agriculture and settlements and ineffective implementation of existing laws and guidelines. Natural events such as cyclones and floods cause land loss and also decrease the functional capabilities of the soil of Chalan beel. Soil degradation in the Chalan beel area results from unplanned land use and due to intrusion of saline water. The extent of land degradation varies according to region, season, and year due to the diverse nature of the driving forces and causes (Rahman, 2009 & 2012).

Land degradation in the Chalan beel is occurring mainly due to rapid changes in demography, traditional shifting cultivation practices, construction of roads and high ways and other physical infrastructure. Land degradation in the Chalan beel is caused mainly due to over exploitation of biomass from agricultural lands, and cultivation of HYV (High Yield Varity) rice through groundwater irrigation. The process has been aggravated by irregular rainfall and insignificant water flow of the rivers that normally play a vital role in replenishing soil fertility and recharge groundwater.

Degradation of soil quality of Chalan beel in the floodplains is mainly attributed to improper use of fertilizers and pesticides to boost agricultural production. Land degradation in the Chalan beel areas of Bangladesh is mainly due to cyclones and storm surges inundating the land. Real and effective ways to minimize land degradation of Chalan beel problems should be based on multi- sectored, multi-layered, yet integrated approaches. The most important policy measure required for addressing land degradation of Chalan beel is an integrated land use policy with respect to agriculture, industry and environment.



Map 2.5
Changing Pattern of Wetland of Chalan beel



Map 2.6
Chalan beel Wetland Decreasing day by day in every year

Illegal Practice on Wetland of Chalan beel

Chalan beel was a riched very potential source of water resources. There was large green land in Chalan beel for which huge number of wild buffalo came here from Japaiguri of India. But for the misuse of that land the green field of Chalan beel is no more and the primary shape of the historical Chalan beel also got a dramatically change. Initially the Chalan beel was extended about eight hundred square kilometers (Hamid 1967) but today the major part of that area is reduced which are not possible to identify as the part of Chalan beel because of establishing village, constructing roads and high ways *etc*. (Rahman, 2012). In 1914 the Chalan beel is divided into two by the construction of Dhaka-Rajshahi Railway and finally the Sirajganj-Bonpara high way stopped its water flow. At once different kinds of dangerous animal like Mesobagh (*Felis viverrina*), Wild buffalo *(Bubalus bubalis),* Crocodile *(Crocodylus Prosus),* Snake *(Naja naja),* Elephant (*Elephas maximus*) *etc*. were found openly in the area of Chalan beel but for the indiscriminate aggression to that area those animals are not found even in search. Chalan beel contributes the rich biodiversity of Bangladesh which is a valuable heritage of our present and future generations. Its value goes beyond the local context; it has a global significance. Over the last hundreds years, the country has lost about 10 percent of its biodiversity. Population pressure, habitat loss, pollution, and poaching are putting tremendous pressures on the existing biodiversity. But unfortunately, unplanned social development and illegal capturing of the water resources Chalan beel can not contribute globally even to our local biodiversity. If the current trend continues, many of the species will be endangered or be even extinct. In case of `Chalan beel" these percentage of lost is near about 3%. The condition of wetlands is even worse than that of forests. Most of the wetlands are being converted into agriculture land and degraded due to development activities. Chalan beel was a great source of fisheries but for collecting fish from Chalan beel indiscriminately damaging this source of fisheries day by day.

IMPACT ON CHALAN BEEL ECOSYSTEM

Impact of Fertilizer and Pesticide Use (Table 2.5 & 2.6)

The use of chemical fertilizers and pesticides has directly linked with farming in irrigated lands. Three types of fertilizers such as Urea, Triple Supper Phosphate (TSP) and Murate of potash (MP) and four types of pesticides are commonly used in Bangladesh, which are insecticides, herbicides, fungicides and rodenticides. The trends of irrigated land and use of chemical fertilizers and pesticides from 1991 to1995 in Bangladesh are presented in

fig-2. In 1991, the use of nitrogenous fertilizer along accounted for about 67% of total fertilizer use, which rose to 88% in 1995. Per hectare use of urea for HYVs rice cultivation in the study area. It is found that more than 90% of the farmers use 298 to 334 kg of urea per hectare, which is much below the average use of urea for HYVs rice cultivation at national level (457 kg per hectare) (Rahman, 2012).

Table 2.5
Consumption of Fertilizer in Singra Beel from 1985 to 2005 (per hectare in quintal)

Years	Compost		Chemical		Grand total	
	Total	**% of total**	**Total**	**% of total**	**Total**	**Percent (%)**
1985	14.28	65.56%	7.5	34.44%	21.78	100%
1995	6.31	17.75%	29.23	82.25%	35.54	100%
2005	2.59	3.09%	81.2	96.91%	83.79	100%

A part of land of Singra *Upazila* is being used for settlements and non-agricultural purpose, so landuse of *Upazila* center is not as in the rural areas. The main reason is enhanced of population. Agricultural activities have been developed in wetland area. Therefore, the landuse for agriculture has been developed in rural area and non-agricultural landuse has been developed in *Upazila* center. The population is increasing but not agricultural land. So the farmers are using chemical fertilizers to meet the demand of food for excess population and to take economic benefit from the land. The peasants are using chemical fertilizers and insecticides to increase production. Excess use of chemical fertilizer declines soil fertility.

The data of chemical fertilizer use in Singra *Upazila* is as below (Table 2.6) (Rahman 2009).

Table 2.6
Net Fertilized Area of Cultivated Area in Singra Upazila (Sub District)

	Net cultivable land	Net fertilized area	
		Total	**Percentages (%)**
1985	113,312	37959.5	33.5
1995	115,807	75981	65.61
2005	120,168	110518	91.9696

Main data source: *Upazila* Agricultural Office, Singra *Upazila*, Natore and Field Survey' 2005.

There has been no significant increase of total chemical fertilizer use at national level. But, significant increase in pesticide use has been observed which has serious implications to land and ecosystem. Research findings show that pesticides applied at the rate of about one kilogram per hectare contaminates the topsoil to a depth of about 30 cm (UNEP, 2001). Pesticides do not only destroy harmful insects but also destroy useful topsoil microbes, which eventually reduce the biological nutrient replenishment of the soil. Application of pesticides in the study area still remains much below the national average (0.35kg per hectare). The local people of the study area claimed that fallow and grazing lands were turned into the lands of rice monoculture and thereby adversely affect the production of green cattle feed. In addition, they also mentioned that, the domestic animals eating pesticides affected grasses also suffer from health problems.

With the increased production of paddy there would be concomitant increase in paddy straw. But the palatability and digestibility of the straw has declined due to excessive use of chemical pesticides. The deep-water aman cultivation was a valuable source of supply of fresh cattle fodder. Moreover, farmers spraying pesticides suffer from heart and skin diseases because of ignorance.

Extensive monopoly of HYVs rice cultivation is removing other crops needed for nutritional welfare of the people. Such monoculture is depleting some specific soil nutrients very rapidly. Deficiency of different micro and macro elements is prevalent in the farming soils. With such complicated adversities, grain yield may be reduced. About 28% of the farmers blamed on the HYVs rice monoculure for the loss of soil fertility of the area. Rahman 2012 in their study claimed that up to 40% of the fertilizers used are leached to low-lying areas where weeds proliferate and an unknown amount of pesticides end up in the irrigation and drainage system. It is also encourages a proliferation of weeds and algae growth which depletes the oxygen content of the water. They also claimed that, in the water of Chalan Beel, the contention of oxygen is only 3mg/Lin the dry season and this is not enough to sustain aquatic life, which needs a minimum of 5mg/L. This may promote the formation of poisonous nitrates in the water. These conditions are responsible for the reduction in the fish population. There are frequent complaints from the Department of Fisheries about the agrochemical toxicity to the fishes. The high level of pesticides leached to the water sources has also been blamed for causing regular outbreaks of epidemic diseases in fishes and is said to have decimated the fish population

in certain areas (Hamid, 1967 & 2002). There is however, no detailed and specific study on the effects of pesticides on fisheries or on wildlife.

Fish production in Chalan Beel has fallen by over 50 percent during the last two decades compared to the annual figure in 1986 of 22 tones. Department of Fisheries officials in Rajshahi have discovered that Chalan Beel, the country's largest sweet and fertile water body, ideal for the production of numerous fish species, started losing its natural capacity after the introduction of IRRI cultivation in the area. According to the Department of Fisheries, fish production in Chalan Beel was remarkably big even during the early 1980s. However they have witnessed that since the appearance of man-made interventions in this harbour, the annual catch declined to 54% from the level in 1986.

Man-made interventions at Chalan Beel which are contributing to toxic environmental contamination include: the relentless use of toxic pesticides and chemical fertilizers in surrounding croplands, excessive removal of surface water and extraction of groundwater for irrigation, large-scale and systemic reclamation of land, decline in the flood plain ecosystem, diversion of water courses, discharge of untreated effluents, dewatering parts of Chalan Beel, and the construction of cross-roads and highways in the area.

ECOLOGICAL CHARACTERISTICS OF CHALAN BEEL

The limnological parameters of the Chalan beel represent typical tropical conditions, although the winters are relatively cool. The mean annual ranges of these parameters are as follows: (i) water temperature (11.5–40^{o}C); (ii) air temperature (8–40^{o}C); (iii) water transparency (18–55cm); (iv) pH (7.2–8.5); (v) dissolved oxygen concentration (5.1–9.6ppm); (vi) free carbon dioxide (1.3–12.3ppm); (vii) carbonate alkalinity (8.3– 15ppm), and (viii) bicarbonate alkalinity (82–117ppm). The mean annual precipitation was 1508 mm over the 2-year study period. The watershed characteristics, especially soil quality and depth, land use, and presence or absence of connecting canals between the river and beels, greatly influence the productivity of the beel (Rahman, 2012). Rivers, floodplains, beels and ponds constitute distinct habitat types in the Chalan beel, as they do in other floodplains in Bangladesh. All the rivers and most perennial beels are owned by the government which, if not formally leased-out, can theoretically be fished by anyone throughout the year. In contrast, the floodplain lands and ponds are privately owned. During inundation, however, floodplains also become open-access resources for fishing. When most of the beels and floodplains dry up, several large rivers retain deeper pools.

Most owners drain their ponds (*kuas*) late in the dry season in order to harvest the remaining fish. There is almost no aquaculture in the rivers, beels and floodplain, although pond owners culture carps (both India major and Chinese) over the 6 to 9 month period when the grow-out conditions are optimal. Professional and subsistence fishers catch fish throughout the year from rivers and beel, while other villagers mainly catch fish from the floodplain during the monsoon season.

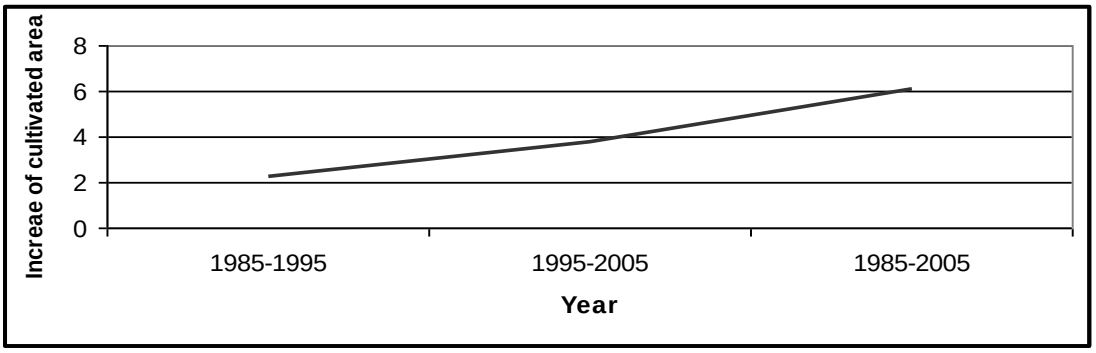
IMPACTS OF ILLEGAL AND OVER FISHING IN THE BEEL

The use of illegal fishing gear and over fishing were found to be very common problems in Chalan Beel. Fishermen were harvesting indiscriminately without considering the impact on natural broods tock or fry. More than 80% of the nets used in fishing were found to be small meshed, capable of catching almost all types of fishes. As both brood stock and fry were caught indiscriminately, fish abundance and the availability of particular species in the beel are decreasing every year. Moreover, during dry season, fishermen harvest fish from low depressions of the beel by complete dewatering. This badly damages fish stocks, contributing to conservation and fisheries management concerns.

IMPACT OF IRRIGATION ON CHALAN BEEL AREA (Figure 2.2 and Table 2.7)

The tremendous increase is made in the installation of shallow tube wells (STWs) and Deep Tube wells (DTWs) for ground water in the Chalan Beel area during the last 30 years. In these areas the cropping pattern is mostly transplanted HYVs Boro/ Aus followed by the rain-fed transplanted Aman. As a result the land remains inundated in most of the seasons (about 6 to 8 months), which keeps adverse effects on soils because of continued oxygen deprivation in the sub-soils. Chemical changes of soil material forming toxic components for plants and constant percolation loss of essential nutrient elements including micro nutrients and organic matter.

Figure 2.2
Changing Pattern of net Cultivated Area in Singra *Upazila* from 1985 to 1997



Main data Source: Agricultural Census, 1986, 1997, *Upazila* Agricultural Office, Singra *Upazila*, Natore and Field Survey' 2005.

Above Graph 2.2 shows that the land use for cultivation in Singra has been increased to 2.2% in 1995. The cultivable land use has been increased to 3.77% from 1995 to 2005 and it has been increased to 6.05% from 1985 to 2005 (Agricultural Census, 1986; 1996 and Field survey, 2005). So the land use for agriculture is increasing for increase of population. So the density of crops is also increasing.

Table 2.7
Land Use for Different Crops in Different Years (in hector)

No.	**Crops**	**2005-06**	**04-05**	**03-04**	**02-03**	**01-02**	**00-01**	**99-00**	**98-99**
1	*Ropa Aman*	32300	32300	33100	-	32150	31000	30150	29500
2	*Aus*	3300	4150	3160	2860	3600	2860	2170	1934
3	*Bona Aman*	10100	10400	11150	9150	11000	9150	10830	10950
4	Mastered	1900	2000	1650	1800	2300	0	-	1550
5	Wheat	2250	2300	1895	1610	2000	0	-	1670
6	*Boro*	31500	32100	32000	32100	32050	31310	30930	30660

Singra *Upazila* Agricultural Office, Natore.

One cropland has been turned into two crops land, two crops land has been turned into three. The above table shows that the maximum land is using for paddy cultivation. The excess cultivation makes land degradation. One crop is sustainable in Chalan beel area. It is not sustainable to cultivate many crops in Chalan beel area. During the rainy season there remains water in the beel area. When the beel area is remaining under floodwater then the silt and sand deposition occurs. Even floodwater causes damages to the crops. These types of land use-changing causes land degradation.

IMPACTS OF DIFFERENT FACTORS ON CHALAN *BEEL* FISHERIES

Gradual habitat degradation and overexploitation are key drivers of biodiversity degradation and declining aquatic production in Chalan beel. Habitat degradation results from increased siltation rates, construction of flood control embankments and roads, uncontrolled use of pesticides, insecticides and chemical fertilizers on croplands, excessive removal of surface water and extraction of groundwater for irrigation, diversion of water courses, unregulated discharge of untreated industrial and aquafarms effluents, fish harvesting by dewatering, *etc*. These factors, which also contribute to already significant reductions in the areal extent of Chalan beel, are pushing many indigenous species to the verge of extinction. As a result of the lack of a proper flood action plan, several Chalan beel restoration projects have exhibited little positive impact.

The width of the embankments often has been narrowed, subjecting them to periodic breaching, while the siting of sluice gates and other water management structures has been poorly planned, and their installation poorly executed. Despite these problems, the Chalan beel still constitutes ≈18% of the country's total beel area. Most of the literal and floodplains areas are cultivated with rice and other crops, providing multiple annual harvests. Thus, government policy has always prioritized cereal food production functions. Consequently, most development initiatives in the Chalan beel have focused on crop cultures, rather than biological management of this rich floodplain system for fish production, ignoring the needs of poorer people for access to renewable protein sources.

Recommendations for Chalan beel Conservation

Modifying Existing Infrastructure to Eco-friendly Structures

Unplanned construction of bridges, culverts, sluice gates, flood control embankments, *etc*., has disrupted the spawning, breeding and feeding migration of fish and other aquatic animals and beel environment.

Rational use of Inorganic Fertilizers and Pesticides, and Proper Management of Industrial Effluents

Integrated pest management programme (IPM) programmes could help minimize the environmental effects of these chemicals

Maintenance of Minimum Water Depth during Water Extractions from critical Water Bodies

Water abstraction from the beels and channels for irrigation during the dry season should be discouraged where feasible, or otherwise regulated.

a) Regulation of Selective Fish Gears, Mesh Sizes, and Fishing Dewatering
b) Establishment of Natural Beel Nurseries and Fish Sanctuaries
c) Strict Application of Existing Biodiversity Rules and Regulations
d) Establishment of Community-based Organizations (CBO)
e) Awareness Building
f) Construction of Eco-friendly Raver Dam
g) Construction Water Reserver
h) Training Programme for Stakeholder
i) Cannel and Water Bodies Link to each others

j) Established Permanent Fish Sanctuary Developed
k) Established Integrated Pest Management System
l) Proper Management of Industrial Effluent of Chalan Beel Area
m) Maintenances of Minimum Water Depth in the Chalan beel
n) Regulation of Selected Fish Gears, Mesh Sizes and Fishing Dewatering and Sanctuary
o) Maintenance Gene Tank
p) Established Community Based Organization (CBO)
q) Formation of Paying Ecosystem Service (PES)
r) Reconstruction of Ecosystem
   i. Charghat Sludge Gate
   ii. Atgori Sludge Gate
   iii. Mini bridge and Culvert Reconstruction
   iv. Water Bodies Reconstruction
   v. Reconstruction of Existing 23000 Ponds
   vi. Reconstruction of Boral River and to Link Every Water Bodies of Chalan beel

This thesis does not attempt to provide an extensive analysis of complex balance of environment and the interaction between the population growth and the use of land resource. Part of the reason is the difficulty in covering such a wide topic and dimension of the problems, as well as the inadequacy and range of data available that can facilitate critical analysis. However, it is found that the intensification of land use and it's associated externalities and spillover have produce environmental problems to a certain level in the area under study. The major types of environmental problems are as follows:

a. Degradation of Soil Quality Due to the Inundation of Land in most of the Seasons Round the year;
b. Decline of Soil Quality due to Increasing Incidence of Unscientific HYVs rice Monoculture and Unbalanced use of Chemical Fertilizer;
c. Increased Pesticide use Particularly of Insecticides with Adverse Environmental Consequences;
d. Increased Health Problems due to Unbalance Use of Pesticides;
e. Substantial Reduction in the Supply of Cattle Fodder due to Over Harvesting;
f. Substantial Reductions in the Stock of Island Fish due to Use of Pesticides;
g. Increased Deforestation Due to Extension of Crop Production and Human Interventions;

The environmental impacts of land use in Chalan beel area may not be considered serious enough in the present context. Balanced and timely application of chemical fertilizers and pesticides will be helpful to improve the environmental quality at this stage. Application of strict regulative measures and creation of farmer's awareness should be considered as top priority in this respect. Integrated pest management and use of traditional knowledge (TKs) which are considered environmentally suitable may also reduce the use of chemical pesticides. To minimize soil nutrient depletion, monoculture of rice needs to be discouraged.

All the above measures may be effective for the present context of the area concerned. But the situation is not easy in the national concept. Bangladesh will have to ensure the supply of food for an additional 40-50 million people during the next twenty years. To meet the increased demand, it is essential that food grain output will have to expand 90 to 100% during the period. In order to meet the challenge the country may face serious environmental hazards in near future. The present knowledge about the process of land degradation because of unplanned efforts of production maximization is inadequate. The potentiality of preventing further degradation in future is also uncertain as the country suffers from lack of innovative technology friendly to environment, a low level of education and social awareness and limited enforcement of laws and regulations. Therefore, in order to combat land degradation and to attain sustainable land management and development, it is very urgent to build institutional arrangement to conduct field level research and apply the result through extension programs along with enabling policy makers to take necessary decisions and to undertake appropriate mitigation measures.

2.6 Chronological Reduction of Biodiversity in Bangladesh (Table 2.8, 2.9, 2.10, 2.11 & 2.12)

From above mentioned case studies it is understood that there are many reasons behind the reduction to endanger, critical endanger, extinct of biodiversity in Bangladesh. The main reasons of them are lack of enforcing laws properly, damaging accommodation, over exploitation, and uncontrolled negative impact in the field of biodiversity throughout Bangladesh.

Chronological reduction of biodiversity will be visible at a glance from the past and present status in the tables given below-

Table 2.8
Past and Present Status of Birds in Bangladesh

Sl.	Order	Local name	*Scientific name*	Status	
				Past	Present
1.	Phasianidae	Black Francolin	*Francolinus francolinus*	R	CR
		Swamp Francolin	*F.gularis*	R	CR
		Kalij pheasant	*Lophura leucomelanos*	UC	EN
		Black partridge	*Perdicula manipurensis*	R	EN
		Grey peacocks pheasant	*Polyplectron bicalcaratum*	R	CR
2.	Dendrocygnidae	Whistling duck	*Cairina scutulata*	R	CR
3.	Anatidae	Knob billed duck	*Sarkidiornis melanotos*	R	CR
4.	Picidae	Wood pecker	*Dendrocopos hyperythrus*	R	VU
5.	Bucerotidae	Oriental pied hornbill	*Anthracoceros albirostris*	UC	EN
		Great hornbill	*Buceros bicornis*	R	CR
		Indian grey hornbill	*Ocyceros birostris*	R	EN
6.	Trogonidae	Red headed trogon	*Harpactes erythrocephalus*	C	EN
7.	Coraciidae	Oriented dollar bird	*Eurystomus orientalis*	C	CR
8.	Alcedinidae	Blyth's kirgfher	*Alcedo hercules*	R	EN
9.	Halcyonidae	Ruddy kirfgher	*Halcyon coromandra*	UC	VU
10.	Centrodiadae	Sirkeer malkona	*Phaenicophaeus leschenaultil*	R	EN
11.	Psitacidae	Alexandrine parakeet	*Psittacula Eupatria*	UC	CR
12.	Strigidae	Spot-bellied Eagle-owl	*Bubo nipalenisis*	R	EN
		Tawny fish owl	*Ketupa Flavipes*	R	EN
		Brown fish owl	*K. zeylonesis*	C	VU
13.	Caprimulgidae	Grey nightjar	*Caprimulgus indicus*	C	EN
14.	Columbidae	Pall capped pigeon	*Columpa punicea*	R	CR
15.	Hellornithidae	Pin-taited green piogeon	*Hellopais personata*	R	EN
16.	Charadriidae	Masked finfoot	*Vanellus duvaucelii*	C	EN
17.	Laridae	River lapwing	*Rhynchops albicolils*	?	EN
18.	Accipitridae	Indian Skimmer	*Haliaeetus leucogaster*	C	EN
		Black bellied tern	*H.leucoryphus*	R	CR
		White-bellied sea eagle	*Sarcogyps calvus*	R	CR
19.	Anhingidae	Palla's fish eagle	*Anhinga melanophus*	C	VU
20.	Ardeidae	Red headed vulture	*Gorsachius melanophus*	UC	CR
21.	Treskiornithidae	Darter	*Platalea leucorodia*	R	CR
22.	Ciconidae	Malayan night heron	*Leptoptillos dubius*	R	EN
23.		Eurasian spoonbill	*L. javanicus*	UC	EN
24.		Greater adjutant	*Mycteria leucocephala*	R	CR
25.		Lesser adjutant	*M.leucocephala*	R	CR
26.	Muscicapidae	Painted storks	*Cochoa purpurea*	--	EN
27.	Sylviidae	Purple cochoa	*Garrulax galbanus*	R	CR
		Yellow throated Lauting thraush	*Paradoxornis flavirostris*	--	CR
		Block-breasted parrotbill	*Pallorneum albiventre*	--	CR
		Spot-Throated Babbter	*P.albiventre*	--	CR
28.	Nectariniidae	Streaked spider hunter	*Arachnothera maga*	R	EN

Code: C- Common, VU- Vulnerable, EN- Endangered, UC- Uncommon, R-Rare, CR- Critically Endangered. Source: Wildlife & it's management (Aziz *et al.*, 2010)

Table 2.9
Past and Present Status of Reptiles in Bangladesh

Sl. Order	Local name	Scientific Name	Status	
			Past	Present
1. Crocodylidae	Salt water crocodyle	*Crocodylus porosus*	--	CR
2. Gavialidae	Geavials	*Gavialis ganheticus*	R	CR
3. Bataguridae	River terrapin	*Batagur baska*	R	CR
	Malayan Box turtle	*Cuora amboinensis*	R	EN
	Black turtle	*Geocle, nys hamitonil*	UC	EN
	Crownel riner turtle	*Hardella thurjii*	C	EN
	Painted roffed turtle	*Kachuga Dhongoka*	UC	EN
	Indian roffed turtle	*K. kachuga*	R	EN
	Brown roofed turtle	*K. smithii*	UC	EN
	Sylhet roofed	*K. sylhetensis*	--	EN
	Tent turtle	*K. tentoria*	C	EN
	Tortoix	*Melanochelys tricarinata*	--	EN
	Tortoix	*Melanochelys trijuga*	--	EN
	Yellow tortoix	*Moenia peters*	C	VU
	Hill yellow tortoix	*Indotestudo elongata*	UC	CR
	Hill tortoix	*Manouria emys*	UC	CR
	Indian soft shell turtle	*Aspideretes nigricans*	C	EN
	Leather back turtle	*A.hurum*	VC	EN
	Bostami turtle	*A.nigricans*	R	CR
	Narrow headed softshell turtle	*Chitra punctata*	C	CR
	Spotted flapshell turtle	*Lissemys punctata*	VC	VU
	African giant soft shell turtle	*Pelochelys bibroni*	UC	CR
	Wall lizard	*Gekko gecko*	C	VU
	House lizard	*Hemidactylus bowringii*	VC	VU
	Geaden lizard	*Calotes rouxii*	--	VU
	Flaying lizard	*Dreaco blanfordii*	--	CR
	Stripped skink	*Mabuya dissmilis*	UC	VU
	Pargal monitor	*Varanus bengalensis*	VC	VU
	Yellow monitor	*V.flavescens*	VC	EN
	Water monitor	*Varanus slavator*	C	EN
	Python	*Python molurus*	UC	EN
	Reticulated pythan	*P. reticulata*	C	CR
	Whip snake	*Aheatulla nasutus*	C	VU
	Green cat Snake	*Boiga cyanea*	UC	VU
	Dag headed snake	*Cerberus rhynchops*	C	VU
	Orrate flying snake	*Chrysoplea ornata*	UC	EN
	Tire snake	*Coluber mucosus*	C	VU
	Tire snake	*Coluber nigromarginatus*	R	VU
	Tree snake	*Dendrelaphis pictus*	UC	VU
	Tree snake	*D. pictus*	UC	VU
	Milk snake	*Elaphe helena*	R	EN

Sl. Order	Local name	Scientific Name	Status	
			Past	Present
	Milk snake	*E. radiata*		EN
	Common wolf snake	*Lycodon aulicus*	C	VU
	Yellow Speckled wolf snaked	*L. fasciatus*	UC	VU
	Banded wolf snake	*L. jara*	C	VU
	Green keelback snake	*Macropisthodon plumbicolor*	R	EN
	White barred kukri	*Oligodon cyclurus*	C	VU
	Spot tailed kukri Snake	*Oligodon dorsalis*	UC	VU
	Red necked keel back	*Rhabdophis subminiatus*	C	VU
	Dark bellied marsh snake	*Xenochrophis cerasogaster*	C	VU
	Black Krait	*Bungarus caeruleus*	C	EN
	Banded krait	*Bungarus fasciatus*	C	EN
	Cobra	*Naja kaouthia*	C	VU
	Binocellate cobra	*Naja naja*	UC	EN
	King Cobra	*Ophiophagus hannah*	UC	EN
	Viper snake	*Trimeresurus erythrurus*	R	EN
	Viper snake	*T. gramineus*	C	EN
	Rusel's viper	*Vipera russellii*	C	CR

Code: C- Common, VU- Vulnerable, EN- Endangered, UC- Uncommon, R-Rare

Source: Wildlife & it's management (Aziz *et al.*, 2010)

Table 2.10
Past and Present Status of Mammal in Bangladesh

Sl	Order	Local name	Scientific Name	Status	
				Past	Present
1.	Loridae	Slow loris	*Nycticebus coucang*	UC	CR
2.	Cercopithecidae	Long tailed mocaque	*Macaca fascicularis*	R	CR
3.		Rhesus mankey	*M. mulatta*	C	VU
4.		Pig tailed macaque	*M. nemestrina*	R	CR
5.	Coloidae	Baboon	*Semnopithecus entellus*	R	CR
		Phayre's Langur	*Trachypithecus phayrel*	UC	CR
		Capped	*T. pileatus*	VC	CR
	Hylobatidae	Gibbons	*Hylobates hoolock*	UC	CR
	Canidae	Small fox	*Canis aureus*	C	VU
		Large dog	*Cuon alpinus*	R	CR
		Fox	*Vulpes bengalensis*	UC	VU
6.	Felidae	Jurgle cat	*Felis chaus*	C	EN
		Goldan cat	*Catopuma temmincki*	R	CR
		Tree tiger	*Neofelis nebulosa*	UC	CR
		Leopard	*Panthera pardus*	UC	CR
		Tiger	*P. tigris*	C	CR
		Fishing cat	*P.viverrinus*	C	EN
	Herpestidae	Large mongoose	*Herpestes edwardsi*	C	VU
		Crab cating mongoose	*H. urva*	R	EN

Sl	Order	Local name	Scientific Name	Status	
				Past	**Present**
		Oher	*Aonyx cinerea*	C	EN
		Oher	*Lutra lutra*	UC	CR
		Bear	*L. perspicillata*	UC	EN
7.	Ursidae	Bear	*Ursus malayanus*	R	CR
		Black beer	*Melursus ursinus*	R	CR
			Ursus thibetanus	UC	EN
8.	Viverridae	Tree beer	*Arctictis binturong*	R	CR
		Asian palm cavit	*Paradoxurus hermaphroditus*	C	VU
		Large Indian cavit	*Viverra zibetha*	R	EN
		Small Indian cavit	*Viverricula indica*	UC	VU
9.	Delphinidae	Irrawoddy dolphin	*Orcaella brevirostris*	UC	CR
		Dolphin	*Peponocephala electra*	C	CR
10.	Phocoenidae	Indian occean finklers porpox	*Neophocaena phocaenoides*	UC	EN
11.	Platanistidae	River dolphin	*Platanista gangetica*	C	EN
12.	Elephantidae	Elephant	*Elephas maximus*	UC	CR
13.	Cervidae	Sumber deer	*Cervus unicolor*	UC	CR
		Barking deer	*Muntiacus muntiak*	C	CR
14.	Bovidae	Barking deer	*Capricornis sumatraensis*	R	CR
15.	Manidae	Jungle deer	*Manis crassicaudata*	R	CR
16.	Hystricidae	Scaly ordeanter	*Hystrix indica*	C	EN
17.	Leporidae	Robbit	*Lepus nigricollis*	C	EN

Code: C- Common, VU- Vulnerable, EN- Endangered, CR- Critically Endangered, UC- Uncommon, R-Rare, Source: Wildlife & it's management (Aziz *et al.,* 2010).

Table 2.11
Present and Past Status of Amphibians

Sl	Order	Name	Scientific name	Status	
				Past	Present
1.	Micohylidae	Painted Bull Frog	*Kaloula pulchra*	C	VU
		Ornate Microhylid	*Microhyla ornata*	C	VU
		Red Microhylid	*Kaloula pulchra*	C	VU
		Ballon Frog	*Uperodon globulosus*	C	EN
2.	Ranidae	Green Frog	*Euphyctis hexadactylus*	C	EN
		Boulenger's Frog	*Rana alticola*	C	VU
		Taipeh Frog	*Rana taipehenisis*	--	EN
3.	Rhacophoridae	Large Tree Frog	*Rhacophorrus maximus*	--	VU

Code: C- Common, VU- Vulnerable, EN- Endangered, Source: Wildlife & it's management (Aziz *et al.,* 2010)

Table 2.12
Extinct Wildlife in Bangladesh

Si.	Animal Name	Scientific name	Period of Extinct	Where found
		Mammals		
1.	Striped Hyena	*Hyaena hyaena*	Unknown	Rajshahi Division, Jessore. Kustia, Faridpur.
2.	Wolf	*Canis lupus*	Unknown	Rajshahi Division, Part of Khulna Division, Noakhali
3.	Malayan sun Bear	*Helorctos malayanus*	1980	Chittagong, Chittagong Hill Tract , Sylhet
4.	Great One Horned Rhinoceros	*Rhinoceros unicornis*	1908	Rangpur, Jessore, Mymonsingh Sylhet, Borishal (Bakergonj) Parbottho Chittagong
5.	Smaller One Horned Rhinoceros	*Rhinoceros Sondaicus*	1987	Sundarban, Rangpur, Dinajpur, Sylhet, Moymonsingho Comilla, Chittagong, Chittagong Hill Tract
6.	Asiatic Two Horned Rhinoceros	*Dicerohinus sumatrensis*	1880	Rangpur, Jessore, Barishal, Sylhet, Comilla, Chittagong, Chittagong Hill Tract
7.	Gaur	*Bos frontalis*	1971	Rangpur, Dinajpur, Sylhet, Moymonsingho, Chittagong, Chittagong Hill Tract
8.	Banteng	*B. javanicus*	1935	Chittagong Hill Tract
9.	Wild Buffalo	*Bubalus bubalis*	1945	Over all Bangladesh
10.	Black buck	*Antelope cervicapra*	Unknown	Rangpur, Dinajpur, Kustia, Meherpur, Khulna
11.	Bulebull	*Bocehpalus tragocamelus*	1940-50	Rajshahi Division
12.	Swamp Deer/ Barasingha	*Cervus duvauceli*	1954	Rangpur, Dinajpur, Mymonsingh, , Noakhali, Barishal, Sylhet, Comilla, Sundarban Chittagong, Chittagong Hill Tract
13.	Pygmy Hog	*Sus salvinus*	Unknown	Rangpur, Dinajpur
		Birds		
14.	Bengal pinkheaded Duck	*Rhodonessa caryophyllacea*	1935	North Bengal, East Bengal Forest
15.	Indian Peafowl	*Pavo cristatus*	1970-75	Rangpur, Dinajpur, Rajshahi, Bogra, Moymonsingho, Dhaka, Noakhali
16.	Green Peafowl	*Pavo muticus spicifer*	1982-85	Parbottho Chittagong
17.	Greater Adjutant	*Leptoptilos dubius*	1977-80	Big river, and Sundarban
18.	Bengal Florican	*Eupodotis bengalensis bengalensis*	1970	Rangpur, Sylhet, Comilla, Chittagon
19.	Painted Stork	*Mycteria leucocephala*	1980-90	Over all Bangladesh
20.	King Vulture	*Sarcogyps calvus*	1972	Over all Bangladesh
		Reptiles		
21.	Indian Egg eating snake	*Elachistodon westermanni*	Unknown	Rangpur
22.	Chittagong Mud Turtle	*Trionux nigricans*	Unknown	Chittagong

Bangladesher Bilupta Bannyaprani (Extinct wildlife of Bangladesh) (Asmat, 2001)

2.7 Conclusion

In this chapter, it had the core causes for the depletion of biodiversity. Among the causes some are quit common but got prominence with a tendency to overlook the possible environmental loss incurred by it. And some are really new, arising out even weird source of evidence; three case studies are attempted to unfold the root causes. This has been chosen on the basis of the different sources; forest sources, land sources and water sources.

For the forest sources, Sundarban has been the place in which thousands depletion case has been confronted and discussed in the chapter. The reason that has come out from the case study is the natural calamity like sidr.

In water sources, chalan beel displays the causes which are so diverse as to range from the over fishing in the area to the innocuous, protective regulation, unable to deter the people.

Moreover, human beings are dependent on biodiversity for different fundamental demand such as food, cloth, fuel, treatment *etc*. If the existence of biodiversity is been endangered then the existence of human being will be destroyed. So the protection of biodiversity is highly essential for the interest of human living sound. After that human beings are hunting many useful animals from the natural sources for their unconsciousness. Be short of proper management and sustainable development, natural plants and animals are being lost day by day. Subject matter of reducing biodiversity is been clear from this chapter.

Chapter 3
Evolution of Environmental Law in Bangladesh

3.1 Introduction

Environmental law is a collective term describing international treaties (conventions), statutes, regulations, and common law or national legislation (where applicable) that operates to regulate the interaction of humanity and the natural environment, toward the purpose of reducing the impacts of human activity (Ball and Bell, 2001).

The topic may be divided into two major subjects: pollution control and remediation, and resource conservation, individual exhaustion. The limitations and expenses that such laws may impose on commerce, and the often unquantifiable (non-monetized) benefit of environmental protection, have generated and continue to generate significant controversy.

Given the broad scope of environmental law, no fully definitive list of environmental laws is possible. The following discussion and resources give an indication of the breadth of law that falls within the "environmental" metric.

History of Environmental Law

Pure water has been an issue in many antique societies and therefore one can admittedly argue that the first legal rules on environmental issues are pretty old - they are clearly originating from roman law rules and were also applied in the Middle Ages in Europe. While it is possible to identify early legal structures that would today fall into the "environmental" law metric - for example the common law recognition of private and public rights to protect interests in land, such as nuisance, or post-industrial revolution human health protections - the concept of "environmental law" as a separate and distinct body of law is a 20th Century development (Haquw, 2002 and Sands, 1998). The recognition that the natural environment was fragile and in need of special legal protections, the translation of that recognition into legal structures, and the development of those structures into a larger body of "environmental law" did not occur until about the 1960s. At that time, numerous influences - including a growing awareness of the unity and fragility of the biosphere following mankind's first steps into outer space (see, for

example, the Blue Marble), increased public concern over the impact of industrial activity on natural resources and human health (see, for example, the 1969 Cuyahoga River fire), the increasing strength of the regulatory state, and more broadly the advent and success of environmentalism as a political movement - coalesced to produce a huge new body of law in a relatively short period of time. While the modern history of environmental law is one of continuing controversy, by the end of the 20th Century, environmental law had been established as a component of the legal landscape in all developed nations of the world, many developing ones, and the larger project of international law.

Origin and Historical Development of International Environmental Law

Environment is a newly generated branch of Public International law and is a recent addition to legal science. Early International Legal Development-Second half of the 19th century: Agreement and cases- some of the first treaties concerned specific species. More recent treaties addresses global images like climate change global warming, Ozone layer depletion etc.

Modern International environmental law had developed thought four distinct phase.

First Phase: Started with the earlier bilateral treaties in the 19th century concluded with the creation of UN organization in 1945. Exploitation of certain natural resources (Flora and Fauna)

Required the Adoption of appropriate legal instruments.

Second Phase: Began with the establishment of UNO and culminated in the historic UN conference on the Human environment held in Stockholm in June 1972.

- Number of International organization were created.
- Many legal instruments addressing particular sources of pollution and the conservation of general and particular environmental resources, e.g., oil pollution, nuclear testing, wetlands, the marine environment , quality of fresh waters and dumping of the water at sea.

The Third Phase: Commenced from the Stockholm conference and ended at UN conference on Environment and Development (UNCED) in June 1992.

- Un came to establish a system of coordinating responses to global environment issues.
- Certain number of global and regional convention and principles were adopted under the auspices of UNO.
- For the first time, Production, consumption and International trade in certain products were prohibited.

Fourth Phase: Set in motion by UN conference on environment and development, 1992 and later development.

- Moment of integration
- Institutionalizing environmental problem in the international law in policy.
- Integrating environmental concerns into all activities.

First Phase:

Development of international rules – concern on the conservation of wild life (Fisheries, Birds and Seals)- to limited extend , the protection of rivers and seals.

The work and research efforts of scientist including Count Buffon in the late 18th and 19th century contributed to legal development.

- By the meet 18th century- the relationship between deforestation and the drying up of water was wildly observed.
- In the Island of Ascension, concern for flora and fauna coincided with industrialization and use of mineral sources.
- Bilateral fisheries conventions were adapted in the med 19th century convention between France and Great Britain relative to fisheries, 11 November 1867, Over Fishing Convention 1882, the first whaling convention, i.e. Convention for the Regulation of Whaling was adapted on 24th September 1931
- The Treaty relating to Boundary Waters between the USA and UK, 11 January 1909
- The first treaty relating to species of wild life was the International Convention for the Protection of Birds Useful to Agriculture, March 1902.
- The Treaty for the Preservation and Protection of Fur Seals, 7 February 1911 between USA and UK.
- 1930s- 1940s to emphases natural resources-to protect flora and fauna, the London Convention Relative to the Preservation of Fauna and Flora in their Natural State, 8 November 1933. The Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, 12 October 1938.

- The Institute de Droit International, A private association of lawyers, adopted international regulation regarding the Use of International Watercourses for Purposes Other than Navigation.
- Cases- *Pacific Fur Seals Arbitration (1893)*- between USA and UK, *Trial Smelter Case (1941)* between USA and Canada over the emission of Sulfur Fumes from a smelter.

Second Phase:

This period was characteristically important for three distinct reasons: (1) International organizations both at the regional and global level for first time involved to address environmental matters as global phenomena, and (2) The area of environmental issues expanded to cover the causes of certain pollution arising out of some ultra-hazardous activities as addressed by international regulatory activity and (3) Third point needs to be mentioned that the relationship between economic development and the protection of environment was developed in a very limited recognition.

IUCN:

In a continued process, the government and non-governmental of UNESCO in October 1948 and attended by 18 governments, seven international organizations, and 107 national organizations, for the first time established international organization. i.e. the International Union for the Protection of Nature (IUPN)

UNCCUR

The efforts of inter-governmental environmental action were culminated in 1947 by the UN through the ECOSOC resolution in convening the historic 1949 United Nations Conference on the Conservation and Utilization of Resource (UNCCUR). The resolution as the reflection of the initiative of Presidents Franklin D. Roosevelt and Harry S. Truman.

In 1954 the General Assembly convened a major conference on the Conservation for the Living Resources of the Sea, which led to the adoption of Conservation Rrules in Geneva in 1958.

The first International Convention for the Prevention of Pollution of the Sea by Oil, London, 12 May 1954, was adopted under the auspices of the International Maritime Organization.

The 1971 Ramsar Convention was the first environmental treaty to establish rules addressing the conservation of a particular type of ecosystem.

At the same time, enlightened public environmental awareness quickly expanded from local to national and from national to international levels.

Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 29 November 1969; Convention on Civil Liability for Oil Pollution Damage, 29 November 1969; Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil 9 June 1969 were adopted. The 1959 Antarctic Treaty committed parties to peaceful activities in that region and prohibited nuclear explosions or the disposal of radioactive waste.

In early 1972, shortly before the Stockholm Conference, the Oslo Dumping Convention was the first treaty to prohibit the dumping of wide range of hazardous substances at sea.

In 1949 the ICJ in a much quoted *Corfu Channel Case*,

In 1957 the *Lac Lanoux Arbitral Tribunal*.

The 1972 United Nations Conference on Human Environment (UNCHE)

The necessity for international action on environmental problems was brought to the world's attention first by scientists and then by inter-governmental meetings. The most notable of which was the United Nations Conference on the Human Environmental held in Stockholm from 5-16 June 1972, under the chairmanship of Maurice Strong, a Canadian and was attended by 114 states and a large number of international institutions and non-governmental observers.

Measures taken at the Conference

The Stockholm Conference unanimously adopted three non-binding instruments: (i) a Resolution on institutional and financial arrangements (ii) a Declaration containing 26 principles, and (iii) an Action Plan containing 109 recommendations.

Significance of the Conference

a. the redefinition of international issues
b. the rationale for co-operation
c. the approach to international responsibility; and
d. the conceptualization of international organizational relationships.

The Stockholm Declaration

a. Two proclaiming rights (Principles 1 and 21);
b. For concerning conservation of resources (Principles 2-5);
c. Two on pollution (Principles 6 and 7);
d. Eight Principles (8-15) addresses issues which reflected the relationship between development and environment.
e. Nine of specific non legal topics (Principles 16-20, 23, 24, 25 and 26);
f. One on state responsibility (Principles 22)

However, from a legal perspective most relevant provisions are Principles 24, 21, 22 and 23

Signification of the Declaration

The real history of environmental law at the international level began with the adoption of the Stockholm Declaration 1972. The international community for the first time agreed to make a compromise between those states which believed it should stimulate public awareness of and concern over environmental issues and those states who wanted the Declaration to provide specific guidelines for future governmental and inter governmental action.

Stockholm achievements: Stockholm follow-up

The creation of United Nations Environmental Programme (UNEP) and the adoption of Principle 21 of the Declaration were the landmark achievements of the Stockholm Conference.

UNEP

The UNEP has been responsible for the establishment and implementation of the regional seas programme, including some more than thirty regional treaties as well as important global treaties addressing ozone depletion, trade in hazardous waste and biodiversity.

Third Phase: Post Stockholm Conference To RIO

Impact of the Stockholm Conference

The impact of the Stockholm Conference is more lasting and endurable than any other UN Conference. The Stockholm Conference set the scene for international activities at the regional and global level and influenced legal and institutional developments up to and beyond UNCED.

At the global level, the most important is likely to be the United Nations Convention on the Law of the Sea (UNCLOS), 1982.

1978 UNEP Draft Principles

The adoption of the 1978 Draft Principles of Conduct in the Field of the Environment for the Guidance of States in the Conservation and Harmonious Utilizations of Natural Resources Shared by Two or More States (in brief the 1978 UNEP Draft Principles) was one of the acts taken by UNEP in the field of international environmental law. The UNEP Draft Principles comprise fifteen Principles to govern the use of shared natural resources.

1981 Montevideo Programme

The UNEP Governing Council adopted the Programme in May 1981 on the basis of the prepared draft, "the Programme for Development and Periodic Review of Environmental Law" (Montevideo Program).

The Montevideo Prorgramme is divided into three parts:

The First Part proposed that guidelines, principles or agreements should be developed to address marine pollution from land based sources; protection of the stratospheric ozone layer; and transport, handling and disposal of toxic and dangerous wastes.

The Second Part proposed that action should be taken to address eight priority subjects areas:

- International cooperational in environmental emergencies;
- Costal ozone management;
- Soil conservation;
- Transboundary air pollution;

- International trade in potentially harmful chemicals;
- Protection of rivers and other inland waters against pollution;
- Environmental impact assessment;
- Legal measures for the prevention of and redress of pollution damage;

The Third Part proposed area of a general nature to promote the development of environmental law through dissemination of knowledge.

The World Charter for Nature

The World Charter for Nature, was adopted by the UNGA on 28 October 1982 through the resolution (37/7), a few months after the UNEP Special Session: The Charter adopted, by vote of 111 in favor, eighteen abstentions and one vote against (USA), constitutes another laudable effort to formulate the general principles of conservation by which all human conduct affecting nature is to be guided and judged although does not purport to have any greater legal effect than the Stockholm Declaration.

The Brundtland Commission

In 1983, the World Commission on Environmental and Development (WCED) chaird by the former Prime Minister of Norway, Gro Harlem Brundtland, was established by the UN General Assembly as an independent group. The Brundtland Commission's Report also identifies six priority areas for legal and institutional change.

Fourth Phase:

Following up on the Brundtland Commission's suggestions, the United Nations General Assembly proposed the United Nations Conference on Environment and Development (UNCED) in December 1989 by passing resolution 44/288. The UNCED (also called the Earth Summit or Rio Conference) took place in Rio de Janerio, Brazil, from 3-14 June 1992.

Contents of Rio-Conference

A the historic Rio Conference five new legal instruments to address global environmental problems were adopted, two of them binding and three of them non-binding.

The two binding instruments include:

- The Framework Convention on Climate Change;
- The Convention on Biological Diversity.
- The three other non binding instruments include:

- the Rio Declaration on Environmental and Development;
- Agenda 21 ; and
- A Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests.

The Rio Declaration

The Rio Declaration represents a careful balance of the principles to be considered important to the developed and the developing countries and a compromise between the objective of environmental protection and economic development.

Post Rio

In addition many Conference have been held on many urgent issues relevant to international environmental law including high seas fisheries, sustainable development of small island developing countries. Examples include:

- The 1993 World Conference on Human Rights in Vienna;
- The 1994 International Conference on Population and Development in Cairo;
- The 1994 Global Conference on the Sustainable Development of Small Island Developing States in Bridgetown, Barbados;
- The 1995 World Summit for Social Development in Copenhagen;
- The 1995 Fourth World Conference on Women in Beijing;
- The 1996 World Food Summit in Rome;
- Earth Summit 1997;
- Millennium Summit 2000;
- Johannesburg Summit 2002.

Emerging Principles of International Environment Law

1) Principle of Sustainable Development
2) Principle of Harm Prevention
3) Principle of Common but differentiated Responsibility
4) Precautionary Principle
5) Principle of Intergenerational Equity

The Bhopal Gas Leak Case: 3 December, 1984 ....40 tons of highly toxic Methyl Isocyanate ---Union Carbide's Chemical Plant.....dead of 3000 people, 200000 people were injured,

In September, 1986, Ind. Govt. sued in the Court of District judge , Bhopal, for Rps, 3900 Crores(US $ 3 billion)

Bhopal Gas Leak Disaster (Processing of claim) Act in March ,1985.
on 14 February, 1989, the Supreme Court --- Us $ 470 Million

International Environmental Law

Pollution, scarce resources, wild animals and plants do not respect political boundaries, making international law an important aspect of environmental law. Numerous legally binding international agreements now encompass a wide variety of issue-areas, from terrestrial, marine and atmospheric pollution through to wildlife and biodiversity protection.

While the bodies that proposed, argued, agreed upon and ultimately adopted existing international agreements vary according to each agreement, certain conferences, including 1972's United Nations Conference on the Human Environment, 1983's World Commission on Environment and Development, 1992's United Nations Conference on Environment and Development and 2002's World Summit on Sustainable Development have been particularly important.

Environmental Law Bangladesh

Environmental issues are one of the main problems of the development of Bangladesh and its taking place as acute problem since 1970s. The scholars also were focusing those environmental problems from 1960s (Khan, 2001; Farooque and Hasan, 1996; Gaan, 2000; Islam et al., 2001). The major problems are being a threat to the existence of human beings. In this situation, global bodies as well as every country of the earth are taking different measures such as laws, policies, treaties, action plan *etc.* to protect the environment and develop its resources.

In Bangladesh, 'Environment' as a distinct topic (Farooque, 2004) assumed remarkable importance in the wake of the two consecutive floods of 1987 and 1988. At the global

level, the main thrust emerged out of the Stockholm Declaration on Human Environment, 1972. However, specific aspects of environment management, directly and indirectly, prevailed in the regulatory regime consisting of policies, legislations, institutions and traditions.

History of environmental laws and policies is not so long. Some countries where industrial revolution and development had taken place in the eighteen-century, introduced some measures to protect the environmental pollution and degradation. For instance, Britain had introduced some laws to control industrial pollution and common property protection in the eighteen and nineteen century (Leelakrishnan, 1999). In Bangladesh, Environmental law and policy has not been realized earlier though it had its existence from the British; period. The British Empire introduced some laws and policies for protecting and developing the environment in Indian subcontinent.

There are different laws and policies for conservation and development of the different sectors of the environment and its resources initiated by British ruler in Britain as well as in Indian subcontinent. Environmental law is originated in Britain through the Landmark Public Health Act, 1875 and then it is developed gradually (Primack, 1993; Bell and Bell, 1996; Ali, 1997; Sattar,1998; Leelakrishnan, 1999; Hasan, 2000; Karim, 2004; Farooque and Hasan, 2004; Khan, 2001 & 2004; Mahammad, 2005; Rahman and Khan, 2005; Alam, 2008 and Mannan, 2012).

The people of this subcontinent had a fascination and respect for the nature over the centuries. The evidences are available in Emperor Ashoka's edicts (272 to 232 BC) where protection of wildlife and prohibition of forest burning were clearly spelt out (Leelakrishnan, 1999). The environmental legislation in the Indian subcontinent was inherited from the British ruler and has developed gradually after the independent of India and Pakistan in 1947. The environmental laws and regulations in Bangladesh are originated from British and Pakistan ruler. After independent in 1971, Bangladesh has gradually realized the environmental problems due to population growth, unplanned infrastructure development, unwise resource utilization *etc.* It is observed that Bangladesh has taken integrated environmental laws, policies and action plan to protect the environment from the pollution for the purposes of achieving sustainable development and environment in the country, which gets priorities in 1990s.

The periods of environmental law in Bangladesh may be divided into three parts *i.e.*

i. British Period (1757-1947)
ii. Pakistan Period (1947-1971)
iii. Bangladesh Period (1972-2004)

There are nearly 58 different environmental legislations in British period, around 40 legislations in Pakistan period and about 90 legislations in Bangladesh period have been passed for protecting and conserving different sectors of environment in Bangladesh.

In this chapter, history origin and development of environmental laws and policies are discussed the British period to present Bangladesh

3.2 Historical Background of Environmental Law in Bangladesh

3.2.1 British Period

The present states of environmental laws need some understanding of its history. The environmental legal mechanism has a long history (Leelakrishnan, 1999). It is observed from the medieval statutes (Khan, 2001) on small-scale pollution and the development of private law principles to deal with threats to communal assets such as water. Indeed, until recently, some would have thought that these laws as part of something called 'environmental law', since their main focus was on the protection of private and common property.

Britain was the pioneer of the industrial revolution in Europe, which influenced other parts of the world that gave position to Britain as the cradle of the Industrial Revolution led to the very early development of public controls specifically related to environmental protection. The most significant provisions were developed in response to public health problems in the mid-nineteenth century, culminating the landmark Public Health Act, 1875 (Leelakrishnan, 1999). Then the British parliament passed another two landmark Acts (Leelakrishnan, 1999) such as the Alkali Act, 1863 to control atmospheric emissions primarily from the Caustic Soda industry, Water pollution control followed the principles of river Pollution Prevention Act, 1876. Britain also introduced some of the earliest provisions for town planning. The first legislation to cover this subject was the Housing Town Planning Act, 1909 which again derived from public health pressures and which vested controls in local authorities at this stage on a non-obligatory basis. In addition to these public controls, the law of nuisance was developed especially in the nineteenth

century as a means of providing private redress for environmental harm (Leelakrishnan, 1999). Britain also had some of the earliest voluntary bodies concerned with environmental protection. Besides, some other environmental legislation was also enacted during the British Period and at present, some of those laws are still in enforcement in Bangladesh, which discussed below:

The Caste Disabilities Removal Act, 1850

Under this Act, provisions are made for preventing discrimination of the caste in society for establishing the equal rights and harmony of the human environment. The section-2 of this Act is repealed by the First Schedule of the Bangladesh Laws (Revision and Declaration) Act, 1973. Under this Act, discrimination in caste system is prohibited for any service or any purpose of the Republic resulting equal rights for all.

The Fatal Accidents Act, 1855

The Fatal Accidents Act was passed in 1855 in order to provide compensation to families for loss occasioned by the death of a person caused by actionable wrong. Whenever the death of a person shall be caused by wrongful act, neglect or default, and the act, neglect or default is such as would have entitled the party who would have been liable if death had not ensured shall be liable to an action or suit for damages. Every such action or suit shall be for the benefit of the wife, husband, parent and child, of the person whose death shall have been so caused, and shall be brought by and in the name of the executor, administrator or representative of the person deceased. The Court may give such damages, as it may think proportioned to the loss resulting from such death to the parties respectively. Aims of this Act were to protect the environment of the human being safety.

The Bangladesh Penal Code, 1860

The Bangladesh Penal Code 1860 has been amended from time to time and kept provisions for punishment for violating the provisions of different laws, but the punishment under the provisions of Penal Code for contravention of legislation is so poor and scattered. There are no punishment provisions under Penal Code for industries, vehicles or others who degrade the environment.

The Canals Act, 1864

The Canals Act was introduce in order to amend and consolidate the law relating to the collection of tools on canals and other lines of navigation, for the construction and improvement of lines of navigation in Bangladesh. Vessel, lines of navigation and Channels are defined in this Act. It is stated that this act is lawful for the Government. Government notifies time to time that the provisions of this Act shall apply to any navigable channels. By this Act, Government shall apply rights to authorize any person to create any navigable channel or any tracking path or improving of any such channel made under this section which are rendered subject to the provision of this Act. The Government may take possession of any land, for public purpose under the provisions.

The Cattle-Trespass Act, 1871

The Cattle Trespass Act was introduced in 1871, which is applicable in the reserved forest or in any portion of a protected forest. Purposes of this Act are to protect forest and prevent the deforestation of the country. Therefore, through this Act lawfully closed to cattle grazing in the forest. If the authority seems that, the cattle grazing in the field deemed to be damaged to a public plantation and if the cattle caused to damage the plantation, then the Forest Officer or Police Officer may seize and impound them in the prescribed manner. It has a provision of fine. The Forest Officer shall never be involved in the forest trade. This Act has been amended four times in 1921, 1934, 1936, and 1947.

The Irrigation Act, 1876

The Irrigation Act was passed in 1876 to provide the Government authority to use and supply the water of any river or stream flowing in a natural channel or of any lake, other natural collection of still water for the purpose of any existing canal or projected canal for irrigation in Bangladesh. Here 'Canal' includes - all canals, channels and reservoirs hitherto constructed, maintained controlled by Government for the supply or storage of water or which may hereafter be constructed, maintained or controlled; all works, embankments, structures, supply and escape channels connected with such canals, channels or reservoir; any part of a river, stream, lake, natural collection of water or natural drainage-channel to which the Government has applied the provisions of Part II of this Act, or which the water has been applied or used before the passing of this Act for the purpose of any existing canal.

The Vaccination Act, 1980

Laws on specific diseases were passed in the late eighteen-century and the Vaccination Act was passed in 1880. Its objective is to make vaccination compulsory for protection and development of the human health environment and it is necessary for the development of a society or a country. So, by this Act, vaccine is ensured for every unprotected child and person for their protection of life. The 'unprotected child' means a child who has not protected from small-pox having had that disease naturally or by having been successfully vaccinated and who has not been certified under the provisions of this Act to be insusceptible of vaccination. On the other hand, the `unprotected person' includes a child who has no parent or guardian and means a person who has not been protected from smallpox by having had that disease naturally or by having been successfully vaccinated and who has not been certified under the provisions of this Act to be insusceptible of vaccination. The parent or guardian of every child is born in any place to which this Act applies for within the six months after the birth of such child. The section-2 of the Vaccination Act has been repealed under the first schedule of the Bangladesh Laws (Revision and Declaration) Act, 1973.

The Obstructions in Fairways Act, 1881

The Obstructions in Fairways Act was passed in 1881 in order to empower the Government to remove or destroy obstructions in fairways and to prevent the creation of such obstruction for maintaining and regulating uninterrupted navigation in the country. Whenever the maintenance or creation of an obstruction in any fairway has become lawful by long usage or otherwise, and such obstruction is removed or destroyed under the section-2 or its creation is emulated or prohibited under secton-8, any person having a right to maintain or create such obstruction shall be entitled to receive from the Government reasonable compensation for any damage caused to him by such removed, destruction, regulation or prohibition. This law was really a landmark for wetland and canal conservation, which are very important for environmental resources and biodiversity conservation, in Indian subcontinent and Bangladesh as well.

The Transfer of Property Act, 1882

This Act was passed in 1882 and amended in 1944. Under this Act, it has been described the modes such as sale, exchange, mortgage, gift *etc.*, of transferring of the vested

property. The section 2 of this Act is repealed under first schedule of the Bangladesh Law (Revision and Declaration) Act, 1973 as amended by the Bangladesh Laws (Revision and Declaration, Third Amendment) Act, 2001. Purposes of this Act are to develop the land administration and management for conserving land resources.

The Explosives Act, 1884

This Act was conceded in 1884 and amended in 1945 and 1987 in order to regulate the manufacture, possession, use, sale, transport and import of explosive substances. Explosive means gunpowder, nitroglycerine, dynamite, guncotton, blasting powders, fulminate of mercury or of other metals, colored fires and every other substance whether similar to those above mentioned or not used or manufactured with a view to produce a practical effect by explosion or a pyrotechnic effect. The Government enacted this Act for ensuring the public safety and free from dangerous substances. The Officers of customs at every port or border check-post shall have the same power in this respect.

The Ferries Act, 1878

This Act was conceded in 1878 and amended in 1885 in order to regulate ferries in Bangladesh. Under this Act, animal, vehicles or other things into any ferry boat, or upon any bridge at such a ferry, which is in such a state or so loaded as to endanger human life or property or who refuges or neglects to leave or remove any animal, vehicle or goods from any ferry-boat and also the maintenance of order and for the safety of passengers and property should be regulated. The public and private ferries are fashioned in navigation. This Act is working for public safety and health.

The Obstruction in Fairways Act, 1881

This Act was passed in order to regulate navigation. All kinds of obstructions in fairways of any port are prohibited. Whenever, in any fairway leading to any port, any vessel, other than Government vessel is sunk, stranded or abandoned, or any fishing stake is placed or left, the government may if in its opinion such thing is or likely to become an obstruction or danger to navigation, cause such thing or any part thereof to be removed; for its nature of description or situation cause the same or any part thereof to be destroyed. Under section 8, the authority shall prohibit the acts which will cause or likely to cause obstruction or danger to navigation.

The Epidemic Diseases Act, 1887

This Act was enacted in 1897 in order to provide for the better prevention of the spread of dangerous epidemic disease, which causes serious damage for human health. When at any time the Government is satisfied that Bangladesh or any part thereof is visited by, or threatened with an outbreak of any dangerous epidemic disease, the Government, if it thinks that the ordinary provisions of the law for the time being in force are insufficient for the purpose may take or require or empower any person to take, such measures and by public notice, prescribe such temporary regulation to be observed by the public or by any person or case of person as it shall deem necessary to prevent the outbreak of such disease or the spread thereof for public health.

The Private Fisheries Protection Act, 1889

This Act was passed in 1889. It may be mentioned that it is the first law enacted by the British among the fisheries laws prevailing in Bangladesh. It provides for the protection of private rights for fishing. This Act has defined as the private fisheries and private waters. Under this Act, if any person wishes to catch fish unlawfully or not having any right for fishing, erects, places, maintains or uses any fixed engine in private waters, or puts, or in any private waters or knowingly permits to be put, therein any matter for the purpose of catching or destroying fish without the permission of the person to whom the rights is ensured. It shall be an offence, and shall be punished for a first offence with a fine not exceeding Tk. 50/- and for a subsequent offence with imprisonment which may be simple or rigorous for a term not exceeding one month or with a fine not exceeding Tk. two hundred or both. It is provided that nothing here in contained shall apply to Act done by any person in the exercise of a bonafide claim of right or shall prevent any person from angling with a rod and line or with a line only in any portion of a navigation river.

The Code of Criminal Procedure, 1898

This Code amounts to public nuisances or unlawful obstruction, unlawful use of any way, river or channel, conduct of any trade or occupation or keeping of any goods or merchandise which is injurious to the public health or physical comfort of the community *etc.*, are regulated in execution under this Code. It is a procedural law and it deals with the public offences and remedies for maintaining peaceful social environment.

The Lepers Act, 1898

The Lepers Act was conceded in 1898 in order to provide for the segregation and medical treatment of pauper lepers and the control of lepers following certain callings. Under this Act, 'Leper' means any person suffering from any variety of leprosy and 'Pauper Leper' means a leper who publicly solicits alms or exposes or exposes or exhibits any sores, wounds, bodily ailment or deformity with the object of exciting charity or of obtaining alms and lastly leper asylum means a leper asylum appointed under section 3. The adequate arrangements are made for the accommodation and medical treatment of lepers and the lepers may be sent to such asylum for which those diseases may not be spread out further in the society.

The Livestock Importation Act, 1898

An Act to make better provision for the regulation of the importation stock.

Whereas it is expedient to make better provision for the regulation of the import live-stock which is liable to be affected by infectious or contagious disorders; It is hereby led as follows:-

1. *Short title and local extent – (i) This Act may be called the Livestock and Livestock Products Importation Act 1898.*[2]

2. *(2) It extends to the whole of India*

2. Definitions – In this Act unless there is anything repugnant in the sub context -

(a) the expression " infectious or contagious disorders" includes tick-pest, glanders, farcy,, scabies and any other disease or disorder which may be specified Central Government by notification in the Official Gazette; and

(b) "live-stock" includes horses, kine, camels, sheep and any other animal may be specified by the Central Government by notification in the Gazette;

(c) "import" means the bringing or taking, by sea, land or air.

(d) "live-stock products' include meat and meat products of all kinds including fresh, chilled and frozen meat, tissue, organs of poultry, pig, sheep, goat, egg and egg powder, milk and milk products, bovine, ovine and caprine, embryos, ova, semen; pet food products of animal origin and any other animal product which may be specified by the Central Government by notification in the Official Gazette.'

3. Power to regulate importation of live-stock – (1) The Central Government may by notification in the official Gazette, regulate, restrict or prohibit ,in such manner and to such extent as it may think fit. (the import], into [India], or any specified place therein, of any stock which may be liable to be affected by infectious or contagious disorders, and of any fodder, dung, stable-litter, clothing harness or fittings appertaining to live-stock or that may have been in contact therewith.

"(2) A notification issued under sub-section (1) or under section 3 A shall operate as if it has been issued under section 11 of the Customs Act,1962 and the officers of the customs at every port airport, Inland Container Depot and Land Customs Station shall have the same powers in respect of any live-stock or live stock product or thing with regard to the importation of which such a notification has been issued and the vessel, aircraft, vehicle and other mode of conveyance containing the same, as they have for the time being in respect of any article the importation of which is regulated, restricted or prohibited by the law relating to customs and the vessel, aircraft, vehicle and other more of conveyance containing the same; and the enactments for the time being in force relating to customs or any such article or vessel, aircraft, vehicle and other mode of conveyance shall apply accordingly.".

"3A. The Central Government may by notification in the Official Gazette, regulate, restrict or prohibit in such manner and to such extent as it may think fit, the import into the territories to which this Act extends, or any live-stock product, which may be liable to affect human or animal health."

4. Power for State Government to make rules.- (1) The State Government may **** rules for the detention, inspection ,disinfections of destruction of imported live-stock , and fodder, dung, stable-litter, clothing, harness or fittings appertaining to imported live-stock or may have been in contact therewith and for regulating the powers and duties of the whom it may appoint in this behalf

(2) In making any rule under this section the State Government may direct that a breach thereof shall be punishable with fine which may extend to one thousand rupees.

5. Protection to persons acting under Act.- No suit, prosecution or other legal product shall lie against any person for anything in good faith done or intended to be under this Act.

The Glanders and Farcy Act, 1899

This Act was conceded in 1899 in order to consolidate and amend the law relating to glanders and farcy. Under this Act, 'diseased' means affected with the glanders or farcy or any other dangerous epidemic among horses which the Government may, by notification in the official Gazette, specify in this behalf. The provision of this Act is applicable to horses, camels, asses and mules. An Inspector, empowered by the Government can seize horses affected by such disease to be examined as soon as possible by a Veterinary Practitioner. The Veterinary Practitioner shall cause the horse seized to be examined as soon as possible. When any diseased horse has been in any building, shed, place or other enclosed place or in any open lines, the Inspector may issue a notice to the owner of the building, shed, place or lines or to the person in charge thereto directing him to have the same disinfected and the internal fittings thereof or such other things found therein or near thereto as the Government may by rule prescribe destroyed. On the failure or neglect of such owner or other person as aforesaid to comply with the notice within a reasonable time, the Inspector shall cause the building shed, place or lines to be disinfected and the fittings or other things to be destroyed.

The Public Parks Act, 1904

This Act was passed in 1904 in order to regulate the public parks in Bangladesh. It may be applied to any park or garden in Bangladesh by order of the Government published in the Official Gazette. In this Act “park” means any public park or garden to which this Act applies by virtue of any order (Mohiuddin Forooque and S. Rizwana Hasan, Laws Regulating Environment in Bangladesh). Under this Act, provisions are laid down such as prohibit and bringing of dogs, motorcars, bicycles or tricycles into the park, prohibit the purchase of any product of the park, breaking trees, branches or plants cutting names or marks on the trees, disfiguring buildings, furniture or monuments, removing or disfiguring labels or marks attached to trees or plants otherwise than from the superintendent or some other authorized person, prohibit shooting, bird-nesting, the catching of butterflies, or any act of cruelty, prohibit or regulate fishing or boating, prohibit batching or the pollution of water by any other means, prohibit the grazing of horses or ponies *etc*., for the management, preservation, regulation of the park for maintaining healthy environment of the park.

The Ports Act, 1908

This Act was passed in 1908 in order to consolidate the enactment relating to ports and port-charges. Aims of this Act are to develop and maintain the river and sea ports through rivers, canals and ocean, prevent the ports and rout from obstructions and pollution such as oil or water mixed with oil, danger arising to public health from the introduction and spread of any transmittable or contagious disease from vessels arriving at the port. This Act is an important for preventing the water pollution and unexpected transmittable disease arrives with vessels unsafe for public health.

The Bengal Mining Settlements Act, 1912

This Act was passed in 1912 in order to provide for the better control and sanitation of mining settlements in India at that time and at present Bangladesh. This Act is also related to occupational rights, amenities, privileges, and safety at work place. It has a 'Mines Board of Health' that administers the sanitation of the mining settlements. Under this Board, the Sanitary Officer will provide for the supply of filtered, boiled water, sanitation and conservancy and housing residents. Besides, under this Act, health and physical environment of mining settlement is mandatory and sanitation with other facilities provided by the authority, also violation of this sanitation and health rules for mining settlers punish by the authority.

The White Phosphorus Matches Prohibition Act, 1913

This Act was passed in 1913 in order to prohibit white phosphorus for the importation, manufacture and sale of matches made from it. In this Act, 'white phosphorus' means the substance commonly known as white or yellow phosphorus. No person shall use white phosphorus in the manufacture of matches and no person shall sell or offer or expose for sale or have in his possession for the purposes of sale, or any matches made with white phosphorus, which is a harmful substance for public health. Under the Factories Act, 1965, an Inspector of factories is made for the execution of the purposes of this Act. If any person contravenes the provisions of these rules, then he or she will be given necessary orders by the competent Magistrate.

The Destructive Insects and Pests Act, 1914

This Act was passed in 1914 in order to prevent the introduction into Bangladesh of any insect, fungus or other pest, which is or may be destructive to crops. The crops include all agricultural or horticultural crops and all trees, bushes or plants. Under this Act, the government may make rules for the detention, inspection, disinfection or destruction of any insect imported or come through otherwise. This Act is pioneering of pest, management at that time in India and in Bangladesh as well for sound environment.

Poisons Act, 1919

This Act was passed in 1919 in order to consolidate and amend the law regulating the importation, possession and sale of poisons and poisonous matters. The Government may by rule regulate within the whole or any part of Bangladesh the possession for sale and the sale, whether wholesale or retail, of any specified poison. Under this Act, the grant of licenses to possess any specified poison for sale, wholesale or retail maintenance by vendors of any poison of register of sales, inspection and examination of any such poison are made. Also the safe custody of poisons and the labeling of the vessels, packages or coverings in which any poison is sold or possessed for sale in execution.

The Cruelty to Animals Act, 1920

This Act was passed in 1920 in order to consolidate and amend the law relating to the prevention of cruelty to animals. Main purpose of this Act is to keep animal environment in peaceful and safe. Under this Act, the protection of domestic animals is ensured. It is only applicable to the domestic animals. In the Act, `animal' means any domestic or captured animal, cruelty means overdrive, unnecessarily beating or ill treats to animals, binds, keeps or carries a animal in such a manner that causes pain and suffer to animal, *etc.* If any person employs in any work or labour any animal which by reason of any disease infirmity, wound, sore or other cause is unfit to be so employed, he shall be punished with fine and other.

The Agricultural and Sanitary Improvement Act, 1920

This Act was passed in 1920 in order to consolidate and amend the law relating to the construction of.drainage and other works for the improvement of the agricultural and sanitary conditions of certain areas in Bangladesh. Under this Act, "tenant" means a

person, whether resident or non-resident in the local area, who holds land or premises for any purposes whatsoever under another person, and is, or but for a special contract would be, liable to pay rent for that land or premises to that person, and includes any rent-free holder or temporary occupant of land or premises.

The Mines Act, 1923

An Act to amend and consolidate the law relating to the regulation and inspection of **mines**. **whereas** it is expedient to amend and consolidate the law relating to the regulation and inspection of **mines** ;

It is hereby enacted as follows:

l. Short title extent and commencement.

1. This Act may be called the **Mines** Act, 1923.
2. It extends to the whole of Pakistan.
3. It shall come into force on the first day of July, 1924.

2. Saving of Regulation XII of 1887. Omitted by para and Schedule I of the Government of India (Adaptation of Indian Laws) Order, 1937.

3. Definitions. In this Act, unless there is anything repugnant in the subject or context,

a. "agent", when used in relation to a mine, means any person appointed or acting as the representative of the owner in respect of the management of the mine or of any part thereof, and as such superior to a manager under this Act;

b. appropriate Government means, in relation to **mines** of nuclear substances, mineral oil natural gas and liquids and substances declared by Federal Law to be dangerously inflammable, oilfields and gas fields the Federal Government and, in relation to other **mines**, the Provincial Government;

c. "Chief Inspector " means the Chief Inspector of **Mines** appointed under this Act;

d. "child " means a person who has not completed his fifteenth year;

e. "day" means a period of twenty-four hours beginning at midnight;

f. "a person is said to be" employed" in a mine who works under appointment by or with the knowledge of the manager, whether for wages or not, in any mining operation, or in cleaning or oiling any part of any machinery used in or about the mine, or in any other kind of work whatsoever incidental to, or connected with, mining operations;

g. "Inspector" means an Inspector of **Mines** appointed under this Act, and includes a District Magistrate when exercising any power or performing any duty of an Inspector which he is empowered by this Act to exercise or perform;

h. "mine" means any excavation where any operation for the purpose of searching for or obtaining minerals has been or is being carried on, and includes all works, machinery, tramways and sidings, whether above or below ground, in or adjacent to or belonging to a mine :

i. Provided that it shall not include any part of such premises on which a manufacturing process is being carried on unless such process is a process for coke making or the dressing of minerals;

j. "owner", when used in relation to a mine, means any person who is the immediate proprietor or lessee or occupier of the mine or of any part thereof, but does not include a person who merely receives a royalty, rent or fine from the mine, or is merely the proprietor of the mine subject to any lease, grant or license for the working thereof, or is merely the owner of the soil and not interested in the minerals of the mine; but any contractor for the working of a mine or any part thereof shall be subject to this Act in like manner as if he were an owner, but not so as to exempt the owner from any liability;

k. "prescribed" means prescribed by regulations, rules or bye-laws; qualified medical practitioner" means any person registered under any Act of the Central Legislature or any Provincial Legislature providing for the maintenance of a register of medical practitioners, and includes, in any area where no such last mentioned Act is in force, any person declared by the appropriate Government, by notification in the official Gazette, to be a qualified medical practitioner for the purposes of this Act ;

l. "regulations" "rules" and "bye-laws" means respectively regulations, rules and bye-laws made under this Act;

m. where work of the same kind is carried out by two or more sets of workers working during different periods of the day, each of such sets is called a relay and the period for which it works is called a shift ;

n. "serious bodily injury" means any injury which involves, or in all probability will involve, the permanent loss of the use of, or permanent injury to, any part of the body or the permanent loss of or injury to the sight or hearing, or the fracture of any 2part of the body or the enforced absence of the injured person from work for a period exceeding twenty days; and

o. "week" means the period between midnight on Saturday night and midnight on the succeeding Saturday night.

4. Chief inspector and inspectors

1) The appropriate Government may, by notification in the official Gazette, appoint a duly qualified person to be Chief Inspector of **Mines** for the whole of Pakistan; or for the Province, as the case may be- and duly qualified persons to be Inspectors of **Mines** subordinate to the Chief Inspector.
2) No person shall be appointed to be Chief Inspector or an Inspector, or having been appointed shall continue to hold such office who is or becomes directly or indirectly interested in any mine or mining rights in Pakistan.
3) The District Magistrate may exercise the powers and perform the duties of an Inspector subject to the general or special orders of the appropriate Government j; Provided that nothing in this sub-section shall be deemed to empower a District Magistrate to exercise any of the powers conferred by section 19 or section 32.
4) The Chief Inspector and every Inspector shall be deemed to be a public servant within the meaning of the Pakistan Penal Code.

5. Functions of inspectors. — (1) The Chief Inspector may, by order in writing, prohibit or restrict the exercise by any Inspector named, or any class of Inspectors specified, in the order of any power conferred on Inspectors by this Act, and shall, subject as aforesaid, declare the local area or areas within which, or the group or class of **mines** with respect to which. Inspectors shall exercise their respective powers.

(2) The Inspector shall give information to owners, agents and managers of **mines**, situate within the local area or areas or belonging to the group or class of **mines**, in respect of which he exercises powers under sub-section (1) as to all regulations and rules which concern them respectively and as to the places where copies of such regulations and rules may be obtained.

6. Powers of inspectors of Mines. The Chief Inspector and any Inspector may

a. make such examination and inquiry as he thinks fit in order to ascertain whether the provisions of this Act and of the regulations, rules and bye-laws and of any orders made thereunder are observed in the case of any mine;

b. with such assistants (if any) as he thinks fit, enter, inspect and examine any mine or any part thereof at

c. examine into, and make inquiry respecting, the state and condition of any mine or any part thereof, the ventilation of the mine, the sufficiency of the bye-laws for the time being in force relating to the mine, and all matters and things connected with or relating to the safety health and welfare of the persons employed in the mine;

d. take, whether on the precincts of the mine or elsewhere, statement of any person which he may consider necessary for carrying out the purposes of this Act; Provided that no one shall be required under this section to answer or give any evidence tending to criminate himself;

e. require the production of any books, registers or other documents, the keeping of which is prescribed, in order to see that they are in conformity with the provisions of this Act and rules and regulations framed thereunder and take into his custody, or make copies of, or extracts from, any such book register or other document;

f. after informing the manager of a mine or his representative, take or remove, for the purpose of analysis samples of materials and substances used or handled in the mine.

7. Powers of special officer to enter, measure, etc.

Any person in the service of the State duly authorised. by a special order in writing of the Chief Inspector or of an Inspector in this behalf may, for the purpose of surveying, leveling or measuring in any mine, after giving not less than three days notice to the manager of such mine, enter the mine and may survey, level or measure the mine or any part thereof at any reasonable time by day or night, but not so as unreasonably to impede or obstruct the working of the mine :

Provided that no such notice need be given if, for reasons to be recorded, the Chief Inspector or Inspector is of opinion that there is an emergency.

8. Facilities to be afforded to inspectors.

Every owner, agent and manager of a mine shall afford the Chief Inspector and every Inspector and every person authorised under section 7 all reasonable facilities for making any entry, inspection, survey, measurement, examination or inquiry under this Act.

9. Secrecy of information obtained.

1) All copies of, and extracts from, registers or other records appertaining to any mine, and all other information acquired by the Chief Inspector or an Inspector or by any one assisting him, in the course of the inspection of any mine under this Act or acquired by any person authorised under section 7 in the exercise of his duties thereunder, shall be regarded as confidential and shall not be disclosed to any person other than a Magistrate or a Commissioner for Workmen's Compensation appointed under the Workmen's Compensation Act, 1923, or an official superior or the owner, agent or manager of the mine concerned, unless the Chief Inspector or the Inspector considers disclosure necessary to ensure the safety of any personal.

2) If the Chief Inspector, or an Inspector or any other person referred to in sub-section (1) discloses contrary to the provisions of sub-section (1), any such information as aforesaid without the consent of the appropriate Government, he shall be guilty of a breach of official trust, and shall be punishable with imprisonment for a term which may extend to one year, or with fine, or with both.

3) No court shall proceed to the trial of any offence under this section except with the previous sanction of the appropriate Government.

9A. Secrecy of source of complaint.

The Chief Inspector or an Inspector shall treat as absolutely confidential the source of any complaint bringing to his notice a defect or breach of any provision of this Act or any rules or regulations made there under and shall not give any intimation to the owner of the mine or his representative that a visit of inspection was made in consequence of the receipt of such a complaint

10. Mining Boards.

(1) The appropriate Government may constitute 8for any part of Pakistan or, as the case may be, of the Province, or for any group or class of **mines**, a Mining Board consisting of

(a) a person in the service of the State, not being the Chief Inspector or an Inspector, nominated by the appropriate Government to act as chairman ;

(b) The Chief Inspector or an Inspector;

(c) a person, not being the Chief Inspector or an Inspector, nominated by the appropriate Government;

(d) two persons nominated by owners of **mines** or their representatives in such manner as may be prescribed ;

(e) two persons to represent the interest of miners, who shall be nominated in accordance with the following provisions :

(i) if there are one or more registered trade unions having in the aggregate as members not less than one quarter of the miners, the said persons shall be nominated by such trade union or trade unions in such manner as may be prescribed ;

(ii) if sub-clause (i) is not applicable and there are one or more registered trade unions having in the aggregate as members not less than 1,000 miners, one of the said persons shall be nominated by such trade union or trade unions in such manner as may be prescribed and the other by the appropriate Government;

(iii) if neither sub-clause (i) nor sub-clause (ii) is applicable, the said persons shall be nominated by the appropriate Government.

Explanation In this clause minor means a person employed otherwise than in a position of supervision or management, in any of the **mines** for which the Mining Board is constituted.

(2) The chairman shall appoint a person to act as secretary to the Board.
(3) The appropriate Government may give directions as to the payment of travelling expenses incurred by the secretary or any member of any such Mining Board in the performance of his duty as such secretary or member.

11. Committees. — (1) Where under this Act any question relating to a mine is referred to a Committee, the Committee shall consist of

(a) a chairman nominated by the appropriate Government or by such officer or authority as the appropriate Government may authorise in this behalf;

(b) a person nominated by the chairman and qualified by experience to dispose of the question referred to the Committee ; and

(c) two persons of whom one shall be nominated by the owner, agent or manager of the mine concerned, and the other shall be nominated by the appropriate Government to represent the interests of the persons employed in the mine.

(2) No Inspector or person employed in or in the management of any mine concerned shall serve as chairman or member of a Committee appointed under this section.

(3) Where an owner, agent or manager fails to exercise his power of nomination under clause (c) of sub-section (1), the Committee may, notwithstanding such failure, proceed to inquire into and dispose of the matter referred to it.

(4) The Committee shall hear and record such information as the Chief Inspector or the Inspector, or the owner, agent or manager of the mine concerned, may place before it, and shall intimate its decision to the Chief Inspector or the Inspector and to the owner, agent or manager of the mine, and shall report its decision to the appropriate Government.

(5) On receiving such report the appropriate Government shall pass orders in conformity therewith unless the Chief Inspector or the owner, agent or manager of the mine has lodged an objection to the decision of the Committee, in which case the appropriate Government may proceed to review such decision and to pass such orders in the matter as it may think fit. If an objection is lodged by the Chief Inspector, notice of the same shall forthwith be given to the owner, agent or manager of the mine.

(6) The appropriate Government may give directions as to the remuneration, if any, to be paid to the members of the Committee or any of them, and as to the payment of the expenses of the inquiry including such remuneration.

12. Powers of mining Boards.

1) Any Mining Board constituted under section 10 and any Committee constituted under section 11 may exercise such of the powers of an Inspector under this Act as it thinks necessary or expedient to exercise for the purpose of deciding or reporting upon any matter referred to it.

2) Every Mining Board constituted under section 10 and every Committee appointed under section 11 shall have the powers of a Civil Court under the Code of Civil Procedure, 1908, for the purpose of enforcing the attendance of witnesses and compelling the production of documents and material objects ; and every person required by any such Mining Board or Committee to furnish information before it shall be deemed to be-legally bound to do so within the meaning of section 176 of the Pakistan Penal Code.

13. Recovery of expenses

The appropriate Government may direct that the expenses of any inquiry conducted by a Mining Board constituted under section 10 or by a Committee appointed under section 11 shall be borne in whole or in part by the owner or agent of the mine concerned, and the amount so directed to be paid may, on application by The Chief Inspector or an Inspector to a Magistrate having jurisdiction at the place where the. mine is situated or where such owner or agent is for the time being resident- be recovered by the distress and sale of any move-able property within the limits of the Magistrates jurisdiction belonging to such owner or agent.

14. Notice before commencement of mining operations.

(1) The owner, agent or manager of a mine shall, in the case of an existing mine within one month from the commencement of the **Mines** (Amendment) Ordinance, 1973, or in the case of proposed mining operations, not less than fifteen days before the commencement of such operations, give to the Chief Inspector and the District Magistrate of the district in which the mine is situated or the operations will commence notice in writing in such form and containing such particulars as may be prescribed.

(2) If the proposed operations in respect of which notice is given under sub-section (1) are not commenced within sixty days from the date on which the notice was given, the said notice shall be deemed to have expired and no operations shall commence except after a notice has been given in accordance with that subsection.

15. Managers

(1) Save as may be otherwise prescribed, every mine shall be under one manager who shall have the prescribed qualifications and shall be responsible for the control,

management and direction of the mine, and the owner or agent of every mine shall appoint himself or some other person, having such qualifications, to be such manager. (2) If any mine is worked without there being a manager for the mine as required by sub-section (1), the owner and agent shall each be deemed to have contravened the provisions of this section.

16. Duties and responsibilities of owners, agents and managers

(1) The owner, agent and manager of every mine shall be responsible that all operations carried on in connection therewith are conducted in accordance with the provisions of this Act and of the regulations, rules and bye-laws and of any orders made there under.

(2) In the event of any contravention of any such provision a by any person whomsoever: the owner, agent and manager of the mine shall each be deemed also to be guilty of such contravention unless he proves that he had taken all reasonable means, by publishing and to the best of his power enforcing those provisions, to prevent such contravention: Provided that the owner or agent shall not be so deemed if he proves:

(a) that he was not in the habit of taking, and did not in respect of the matter in question take, any part in the management of the mine ; and

(b) that he had made all the financial and other provisions necessary to enable the manager to carry out his duties; and

(c) that the offence was committed without his knowledge, consent or connivance.

(3) Save as hereinbefore provided, it shall not be a defense in any proceedings brought against an owner or agent of a mine under this section that a manager of the mine has been appointed in accordance with the provisions of this Act.

The Forest Act, 1927

The Forest Act was passed in 1927 in order to consolidate the law relating to forests, the transit of forest-produce and the duty levy able on timber and other forest productions. This law updated and consolidated the provisions of the laws earlier regarding protection and development of forests after repealing the Indian Forest Act, 1878. The original forest Act named 'the Forest Act, 1890' and the amending Acts of 1891, 1901, 1911, 1914, and 1988 were enacted. Availability of forestland in Bangladesh is one of the lowest in the world. Between the 18th and the middle of the 19th century, different parts of Indian forests were subjected for exploitation on a huge scale under the rule of the English East

India Company and, later, the British government. Forest areas shrank during British rule because of the extension of agriculture. The Sundarbans alone shrank by about 1000 sq miles. By 1864, the conservation of forests in Bengal began with the appointment of a conservator of forests. The first notification reserving forests came on 14th December 1864. By 1872, about 60,000 sq miles of forests were demarcated as reserved forests in Bengal, Bihar, Orissa and Assam. Purposes of this Act is to conserve and develop the forest and its resources such as trees, plants, wild animals, forest, water resources, surface soil, minerals *etc.* There are many goods come from forest such as timber, charcoal, caoutchouc, catechu, wood-oil, resin, nature varnish, bark, lac, mahua, flower, mahua seeds, myrabolams, laves for fuel and home, flowers and fruits, other plants such as grass for fuel and home, creepers, reeds, moss, skins, tusks, horns, bones, silk, cocoons, honey and many other products from animals and trees *etc.* Under this Act, the reserved forest means, the government may constitute any forest-land or waste-land or any land suitable for a afforestation which is the property of Government or on which the government has proprietary rights or to the whole or any part of the forest resources of which the government is entitled. This Act is really a milestone for wild life, forest resources and biodiversity conservation and development.

Whereas it is expedient to consolidate the law relating to forests, the transit of forest-produce and the duty leviable on timber and other forest-produce; It is hereby enacted as follows:-

Short title and extent

(1) This Act may be called the Forest Act, 1927. 2[(2) It extends to the whole of Bangladesh.] (3) [Omitted by the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973), section 3 and 2nd Schedule.

Interpretation clause

2. In this Act, unless there is anything repugnant in the subject or context,- (1) "cattle" includes elephants, camels, buffaloes, horses, mares, geldings, ponies, colts, fillies, mules, asses, pigs, rams, ewes, sheep, lambs, goats and kids; (2) "Forest-officer" means any person whom the Government or any officer empowered by the Government in this behalf, may appoint to carry out all or any of the purposes of this Act or to do anything

required by this Act or any rule made there under to be done by a Forest-officer; (3) "forest-offence" means an offence punishable under this Act or under any rule made thereunder; (4) "forest-produce" includes (a) the following whether found in, or brought from, a forest or not, that is to say: timber, charcoal, cuatchouc, catechu, wood-oil, resin, natural varnish, bark, lac, mahua flowers, mahua seeds, kuth and myrabolams, and (b) the following when found in or brought from, a forest, that is to say:

i) trees and leaves, flowers and fruits, and all other parts or produce not hereinbefore mentioned, of trees, (ii) Plants not being trees (including grass, creepers, reeds and moss), and all parts or produce of such plants, (iii) wild animals and skins, tusks, horns, bones, silk, cocoons, honey, and wax, and al other parts of produce of animals, and (iv) peat, surface, soil, rock and minerals (including limestone, laterite, mineral oils and all products of mines or quarries); 3[(4A) "owner" includes a Court of Wards in respect of property under the superintendence or charge of such court;] (5) "river" includes any stream, canal, creek or other channels, natural or artificial; (6) "timber" includes trees when they have fallen or have been felled, and all wood whether cut up or fashioned or hollowed out for any purpose or not; and (7) "tree" includes palms, bamboos, stumps, brushwood and canes.

Power to reserve forests

3. The Government may constitute any forest-land or waste-land 4[or any land suitable for afforestation] which is the property of Government, or over which the Government has proprietary rights, or to the whole or any part of the forest-produce of which the Government is entitled, a reserved forest in the manner hereinafter provided.

Notification by Government

4. (1) Whenever it has been decided to constitute any land reserved forest, the Government shall issue a notification in the official Gazette (a) declaring that it has been decided to constitute such land a reserved forest; (b) specifying, as nearly as possible, the situation and limits of such land; and (c) appointing an officer (hereinafter called "the Forest Settlement-officer") to inquire into and determine the existence, nature and extent of any rights alleged to exist in favour of any person in or very any land comprised within

such limits, or in or over any forest-produce, and to deal with the same as provided in this Chapter. **Explanation**.-For the purposes of Clause (b), it shall be sufficient to describe the limits of the forest by roads, rivers, ridges or other well-known or readily intelligible boundaries. (2) The officer appointed under clause (c) of sub-section (1) shall

Bar of accrual of forest rights

5. After the issue of a notification under section 4, no right shall be acquired in or over the land comprised in such notification, except by succession or under a grant or contract in writing made or entered into by or on behalf of the Government or some person in whom such right was vested when the notification was issued; and no fresh clearings for cultivation or for any other purpose shall be made in such land except in accordance with such rules as may be made by the Government in this behalf.

Proclamation by Forest Settlement officer

6. When a notification has been issued under section 4, the Forest Settlement-officer shall publish in 5[Bengali] in every town and village in the neighbourhood of the land comprised therein, a proclamation- (a) Specifying, as nearly as possible, the situation and limits of the proposed forest; (b) explaining the consequences which, as hereinafter provided, will ensue on the reservation of such forest; and (c) fixing a period of not less than three months 6[and not more than four months] from the date of such proclamation, and requiring every person claiming any right mentioned in section 4 or section 5 within such period either to present to the Forest Settlement- officer a written notice specifying or to appear before him and state, the nature of such right and the amount particulars of the compensation (if any) claimed in respect thereof.

11. (1) In the case of a claim to a right in or over any land other than a right-of-way or right of pasture, or a right to forest-produce or a water-course, the Forest Settlement-officer shall pass an order admitting or rejecting the same in whole or in part. (2) If such claim is admitted in whole or in part, the Forest Settlement-officer shall either-

(i) exclude such land from the limits of the proposed forest; or (ii) come to an agreement with the owner thereof for the surrender of his rights; or (iii) proceed to acquire such land in the manner provided by the 7[Acquisition and Requisition of Immovable Property

Ordinance, 1982 (II of 1982)]. (3) For the purpose of so acquiring such land (a) the Forest Settlement-officer shall be deemed to be a Collector proceeding under the 8[Acquisition and Requisition of Immovable Property Ordinance, 1982 (II of 1982)]. (b) the claimant shall be deemed to be a person interested and appearing before him in pursuance of a notice given under section 9 of that Act; (c) the provisions of the preceding sections of that Act shall be deemed to have been complied with; and (d) the Collector, with the consent of the claimant, or the Court, with the consent of both parties, may award compensation in land, or partly in land and partly in money.

Order on claims to rights of pasture or to forest-produce

12. In the case of a claim to rights of a pasture or to forest-produce, the Forest Settlement-officer shall pass an order admitting or rejecting the same in whole or in part.

Record to be made by Forest Settlement-officer

13. The Forest Settlement-officer, when passing any order under section 12, shall record, so far as may be practicable,- (a) the name, father's name, caste, residence and occupation of the person claiming the right; and (b) the designation, position and area of all fields or groups of fields (if any), and the designation and position of all buildings (if any) in respect of which the exercise of such rights is claimed.

Record where the admits claim

14. If the Forest Settlement-officer admits in whole or in part any claim under section 12, he shall also record the extent to which the claim is so admitted, specifying the number and description of the cattle which the claimant is from time to time entitled to graze in the forest, the season during which such pasture is permitted, the quantity of timber and other forest-produce which he is from time to time authorized to take or

Exercise of rights admitted

15. (1) After making such record the Forest Settlement-officer shall, to the best of his ability, and having due regard to the maintenance of the reserved forest in respect of which the claim is made, pass such orders as will ensure the continued exercise of the rights so admitted. (2) For this purpose the Forest Settlement-officer may (a) set out some other forest-tract of sufficient extent, and in a locality reasonably convenient, for

the purposes of such claimants, and record an order conferring upon them a right of pasture or to forest-produce (as the case may be) to the extent so admitted; or (b) so alter the limits of the proposed forest as to exclude forest-land of sufficient extent, and in a locality reasonably convenient, for the purposes of the claimants; or (c) record an order, continuing to such claimants a right of pasture or to forest-produce, as the case may be, to the extent so admitted, as such seasons, within such portions of the proposed forest, and under such rules, as may be made in this behalf by the Government.

Commutation of rights

16. In case the Forest Settlement-officer finds it impossible, having due regard to the maintenance of the reserved forest, to make such settlement under section 15 as shall ensure the continued exercise of the said rights to the extent so admitted, he shall, subject to such rules as the Government may make in this behalf, commute such rights, by the payment to such persons of a sum of money in lieu thereof, or by the grant of land, or in such other manner as he thinks fit.

Time limit for resolution of claims

10 [16A. (1) Within 12 months after the period fixed under section 6 has elapsed, or within 12 months after the enactment of this section, whichever is later, the Forest Settlement Officer shall do one of the following:- (i) dispose of all claims made under sections 6 and 9; or (ii) obtain an extension of this 12 months deadline under sub-section (2). (2) Upon application of a Forest Settlement Officer, the Deputy Commissioner may grant a single 2 months extension of the deadline in sub-section (1), making the deadline 14 months, and if that extended deadline threatens to be missed, the Commissioner may grant additional 4 months extensions.

Appeal from order passed under section 11, section 12, section 15 or section 16

Appeal under section 17

18. (1) [Omitted by section 3 of the Forest (Amendment) Act, 2000 (Act No. X of 2000).] 12 [(2)(a) An appeal shall be heard by the Divisional Commissioner in the manner prescribed for the time being for the hearing of appeals in matters relating to land-development tax and the appeal shall be disposed of within 6 months from the date of

presenting it under section 17. (b) The Divisional Commissioner shall report to the Government the particulars of the cases which could not be disposed by him within the time prescribed in clause (a), where upon the Government may extend time as deemed necessary.] (3) The order passed on the appeal by the Divisional Commissioner shall, subject only to revision by the Government, be final.]

Pleaders

19. The Government, or any person who has made a claim under this Act, may appoint any person to appear, plead and act on its or his behalf before the Forest Settlement-officer, or 13[the Divisional Commissioner], in the course of any inquiry or appeal under this Act.

Notification declaring forest reserved

20. (1) When the following events have occurred, namely:- (a) the period fixed under section 6 for preferring claims has elapsed, and all claims, if any, made under that section or section 9 have been disposed of by the Forest Settlement-officer; (b) if any such claims have been made, the period limited by section 17 for appealing from the orders passed on such claims has elapsed, and all appeals (if any) presented within such period have been disposed of by the 14[Divisional Commissioner]; and

(c) all lands (if any) to be included in the proposed forest, which the Forest Settlement-officer has, under section 11, elected to acquire under

the 15 [Acquisition and Requisition of Immovable Property Ordinance, 1982 (II of 1982), have become vested in the Government under section 11 of that Ordinance], the Government shall publish a notification in the official Gazette, specifying definitely, according to boundary-marks erected or otherwise, the limits of the forest which is to be reserved, and declaring the same to be reserved from a date fixed by the notification. (2) From the date so fixed such forest shall be deemed to be a reserved forest.
Publication of translation of such notification in neighbourhood of forest

21. The Forest-officer shall, before the date fixed by such notification, 16 [cause it] to be published in every town and village in the neighbourhood of the forest.

Power to revise arrangement made under section 15 or section 18

22. The Government may, within five years from the publication of any notification under section 20, revise any arrangement made under section 15 or section 18, and may for this purpose rescind or modify any order made under section 15 or section 18, and direct that any one of the proceedings specified in section 15 be taken in lieu of any other of such proceedings, or that the rights admitted under section 12 be commuted under section 16.

No right acquired over reserved forest, except as here provided

23. No right of any description shall be acquired in or over a reserved forest except by succession or under a grant or contract in writing made by or on behalf of the Government or some person in whom such right was vested when the notification under section 20 was issued.

Rights not to be alienated without sanction

24. (1) Notwithstanding anything contained in section 23, no right continued under clause (c) of sub-section (2) of section 15 shall be alienated by way of grant, sale, lease, mortgage or otherwise, without the sanction of the Government:

Provided that, when any such right is appendant to any land or house, it may be sold or otherwise alienated with such land or house. (2) No timber or other forest-produce obtained in exercise of any such right shall be sold or bartered except to such extent as may have been admitted in the order recorded under section 14.

Power to stop ways and water-courses in reserved forests

25. The Forest-officer may, with the previous sanction of the Government or of any officer duly authorized by it in this behalf, stop any public or private way or water-course in a reserved forest, provided that a substitute for the way or water-course so stopped, which the Government deems to be reasonably convenient, already exists, or has been provided or constructed by the Forest-officer in lieu thereof.

Acts prohibited in such forests

26. 17[(1) Any person who, in a reserved forest- (a) kindles, keeps or carries any fire except at such seasons as the Forest-Officer may notify in this behalf. (b) trespasses or pastures cattle, or permits cattle to trespass; (c) causes any damage by negligence in

felling any tree or cutting or dragging any timber; (d) quarries stone, burns lime or charcoal, or collects, subjects to any manufacturing process, or removes, any forest produce other than timber; or who enters a reserved forest with fire arms without prior permission from the Divisional Forest Officer concerned, shall be punishable with imprisonment for a term which may extend to six months and shall also be liable to fine which may extend to two thousand Taka, in addition to such compensation for damage done to the forest as the convicting Court may direct to be paid. (1A) Any person who (a) makes any fresh clearing prohibited by section 5; or (b) removes any timber from a reserved forest; or (c) sets fire to a reserved forest, or, in contravention of any rules made by the Government in this behalf, kindles any fire, or leaves any fire burning, in such manner as to endanger such a forest; or who, in a reserved forest

(d) fells, girdles, lops, taps or burns any tree or strips off the bark or leaves from or otherwise damages, the same; (e) clears or breaks up any land for cultivation or any other purpose 18[or cultivates or attempts to cultivate any land in any other manner]; (f) in contravention of any rules made in this behalf by the Government, hunts, shoots, fishes, poisons water or sets traps or snares; or (g) establishes saw-pits or saw-benches or converts trees into timber without lawful authority, shall be punishable with imprisonment for a term which may extend to

five years and shall not be less than six months, and shall also be liable to fine which may extend to fifty thousand Taka and shall not be less than five thousand Taka, in addition to such compensation for damage done to the forest as the convicting Court may direct to be paid.] (2) Nothing in this section shall be deemed to prohibit (a) any act done by permission in writing of the Forest-officer, or under any rule made by the Government; or (b) the exercise of any right continued under clause (c) of sub-section (2) of section 15, or created by grant or contract in writing made by or on behalf of the Government under section 23. (3) Whenever fire is caused wilfully or by gross negligence in a reserved forest, the Government may (notwithstanding that any penalty has been inflicted under this section) direct that in such forest or any portion thereof the exercise of all rights of pasture or to forest-produce shall be suspended for such period as it thinks fit.

Power to declare forest no longer reserved

27. (1) The Government may, by notification in the official Gazette, direct that, from a date fixed by such notification, any forest or any portion thereof reserved under this Act shall cease to be a reserved forest. (2) From the date so fixed, such forest or portion shall cease to be reserved; but the rights (if any) which have been extinguished therein shall not revive in consequence of such cessation.

Village-forests and social forestry

Formation of village forests 28. (1) The Government may assign to any village community the rights of Government to or over any land which has been constituted a reserved forest, and may cancel such assignment. All forests so assigned shall be called village forests. (2) The Government may make rules for regulating the management of village-forests, prescribing the conditions under which the community to which any such assignment is made may be provided with timber or other forest-produce or pasture, and their duties for the protection and improvement of such forest. (3) All the provisions of this Act relating to reserved forests shall (so far as they are not inconsistent with the rules so made) apply to village-forests.

Social Forestry

(1) On any land which is the property of the Government or over which the Government has proprietory rights, and on any other land assigned to the Government by voluntary written agreement of the

owner for the purpose of afforestation, conservation or management through social forestry, the Government may establish a social forestry programme under sub-section (2). (2) A social Forestry programme is established when the Government by one or more written agreements assigns rights to forest-produce or rights to use the land, for the purposes of social forestry, to person assisting the Government in management of the land. (3) Notwithstanding any other provision of law, agreements under sub-section (2) concerning Government-owned lands need not be registered in the local records of right to lands, and no party to such an unregistered agreement may be divested of rights solely by execution of a subsequent assignment of rights by the Government to another person. (4) The Government may make rules to set out standards for social forestry agreements

and programme, and such standards shall at a minimum (i) require agreements to include or make reference to an agreed-upon management plant for the social forestry programme; (ii) guarantee participants an equitable share of proceeds in return for labour invested;

(iii) in the case of agreements contemplating timber harvest, require the duration of agreements to include the expected principal harvest; (iv) allow transfer of benefits and obligations under agreements between spouses, and, when a participant dies, under the laws of succession to his heir, and govern other transfers; (v) allow creation and dissolution of management committees representing participants in particular programmes, and empower the management committees to impose fine on participants for violation of agreement; and (vi) allow persons to petition the Government for 'undertaking' social forestry programme. (5) The Government may make rules to set out other requirements or guarantees for agreements, including (i) duties of participants to assist forest officers; and (ii) any other matter concerning formation or operation of social forestry programmes. (6) Rules made under this section may recognize different classes of social forestry programmes, and the Government may make different rules for different classes or programmes. (7) The Government may publish guidelines and forms for social forestry agreements.

Effect of other of law on social forestry

28B. (1) For the purposes of section 26 and 34, the exercise of any right granted by a social forestry agreement under section 28A shall be considered to be done with permission in writing of the Forest-Officer. (2) Section 80 shall not apply to private lands subject to a voluntary written agreement under section 28A, unless such agreement itself allows the Government to invoke all or part of section 80. (3) Section 81 shall not apply to participants in social forestry projects under section 28A.]

Protected forests

29. (1) The Government may, by notification in the official Gazette, declare the provisions of this Chapter applicable to any forest-land or waste-land which is not included in a reserved forest, but which is the property of Government, or over which the Government has proprietary rights, or to the whole or any part of the forest -produce of

which the Government is entitled. (2) The forest-land and waste-lands comprised in any such notification shall be called a "protected forest". (3) No such notification shall be made unless the nature and extent of the rights of Government and of private persons in or over the forest-land or waste-land 21[or charland] comprised therein have been inquired into and recorded at a survey or settlement, or in such other manner as the Government thinks sufficient. Every such record shall be presumed to be correct until the contrary is proved: Provided that, if, in the case of any forest-land or waste-land, 22[or charland] the Government thinks that such inquiry and record are necessary, but that they will occupy such length of time as in the meantime to endanger the rights of Government, the Government may, pending such inquiry and record, declare such land to be a protected forest, but so as not to abridge or affect any existing rights of individuals or communities.

Power to issue notification reserving trees, etc

30. The Government may, by notification in the official Gazette,- (a) declare any trees or class of trees in a protected forest to be reserved from a date fixed by the notification; (b) declare that any portion of such forest specified in the notification shall be closed for such term, not exceeding thirty years, as the Government thinks fit, and that the rights of private persons, if any, over such portion shall be suspended during such term, provided that the remainder of such forest be sufficient, and in locality reasonably convenient, for the due exercise of the rights suspended in the portion so closed; or (c) prohibit, from a date fixed as aforesaid, the quarrying of stone, or the burning of lime or charcoal, or the collection or subjection to any

manufacturing process, or removal of, any forest-produce in any such forest, and the 23[breaking up, clearing or use] for cultivation, for building, for herding cattle or for any other purpose, of any land in any such forest.

Publication of translation of such notification in neighbourhood

31. The Collector shall cause a translation into 24 [Bengali] of every notification issued under section 30 to be affixed in a conspicuous place in every town and village in the neighbourhood of the forest comprised in the notification.

Power to make rules for protected forests

32. The Government may make rules to regulate the following matters, namely:- (a) the cutting, sawing, conversion and removal of trees and timber, and the collection, manufacture and removal of forest-produce, from protected forests; (b) the grating of licences to the inhabitants of towns and villages in the vicinity of protected forests to take trees, timber or other forest-produce for their own use, and the production and return of such licences by such persons; (c) the granting of licences to persons felling or removing trees or timber or other forest-produce from such forests for the purposes of trade, and the production and return of such licences by such persons; (d) the payments, if any, to be made by the persons mentioned in clauses (b) and (c) for permission to cut such trees, or to collect and remove such timber or other forest-produce; (e) the other payments, if any, to be made by them in respect of such trees, timber and produce, and the places where such payment shall be made; (f) the examination of forest-produce passing out of such forests; (g) the clearing and breaking up of land for cultivation or other purposes in such forests; (h) the protection from fire of timber lying in such forests and of trees reserved under section 30; (i) the cutting of grass and pasturing of cattle

(i) the cutting of grass and pasturing of cattle in such forests; (j) hunting, shooting, fishing, poisoning water and setting traps or snares in such forests, 25[* * *]; (k) the protection and management of any portion of a forest closed under section 30; and (l) the exercise of rights referred to in section 29.

Penalties for acts in contravention of 26[section 28A or of] notification under section 30 or of rules under section 32

33. 27[(1) Any person who commits any of the following offences, namely:- (a) contrary to any prohibition under section 30, quarries any stone, or burns any lime or charcoal, or collects, subjects to any manufacturing process, or removes any forest produce other than timber; (b) leaves burning any fire kindled by him in the vicinity of any protected forest; (c) causes any damage by negligence in felling any tree or cutting or dragging any timber; (d) trespasses or pastures cattle, or permits cattle to trespass; (e) enters a protected forest with fire arms without prior permission from the Divisional Forest Officer concerned; (f) infringes any rule made under section 32 28[;] 29[(g) any offence or damage committed

against social forestry programme will be deemed as an offense,] shall be punishable with imprisonment for a term which may extend to six months and shall also be liable to fine which may extend to two thousand Taka, in addition such compensation for damage done to the forest as the convicting court may direct to be paid. (1A) Any person who commits any of the following offences, namely: (a) sets fire to a protected forest or, in contravention of any rules made by the Government in this behalf, kindles any fire, or leaves any fire burning, in such manner as to endanger such a forest; (b) fells, girdles, lops, taps or burns any tree reserved under section 30, or strips off the bark or leaves from, or otherwise damages, any such tree; (c) contrary to any prohibition under section 30, clears or breaks up any land for cultivation or other purpose 30[or cultivates or attempts to cultivate any land in any other manner] in the protected forest; (d) in contravention of any rules made in this behalf by the Government, hunts, shoots, sets traps or snares or catches or kills any wild animals and birds, fishes or poisons water; (e) establishes saw-pits or saw-benches or converts tree into timber without lawful authority in a protected forest; (f) removes any timber from a protected forest; shall be punishable with imprisonment for a term which may extend to five years and shall not be less than six months and shall also be liable to fine which may extend to fifty thousand Taka and shall not be less than five thousand Taka, in addition such compensation for damages done to the forest as the convicting Court may direct to be paid.]

(2) Whenever fire is caused wilfully or by gross negligence in a protected forest, the Government may, not withstanding that any penalty has been inflicted under this section, direct that in such forest or any portion thereof the exercise of any right of pasture or to forest -produce shall be suspended for such period as it thinks fit.

Nothing in this Chapter to prohibit acts done in certain cases

34. Nothing in this Chapter shall be deemed to prohibit any act done with the permission in writing of the Forest-officer, or in accordance with rules made under section 32, or, except as regards any portion of a forest closed under section 30, or as regards any rights the exercise of which has been suspended under section 33, in the exercise of any right recorded under section 29.

The control over forests and lands not being the property of government

31 [Repealed] 35. [Repealed by section 63 of the Private Forests Ordinance, 1959 (Ordinance No. XXXIV of 1959).]

32 [Repealed]

36. [Repealed by section 63 of the Private Forests Ordinance, 1959 (Ordinance No. XXXIV of 1959).]

33 [Repealed]

37. [Repealed by section 63 of the Private Forests Ordnance, 1959 (Ordinance No. XXXIV of 1959).]

Repealed] 38. [Repealed by section 63 of the Private Forests Ordinance, 1959 (Ordinance No. XXXIV of 1959).]

Operation of the Privet Forest Ordinance

38A. (1) After commencement of this section, the Government may no longer exercise authority to vest control of forest land under sub-section (2) of section 6, section 7 or section 11 of the Private Forest Ordinance, 1959 (E. P. Ordi-nance No. XXXIV of 1959): Provided that the forest land already vested shall remain vested.

(2) After commencement of this section, the Government may no longer exercise authority under section 3 of the Private Forests Ordinance, 1959 (E. P. Ordinance No. XXXIV of 1959) to require private forests to have working plans.

Notice of forest management activities

38B. (1) The Government may make rules for the purpose of issuing notice to owners or occupiers of neighbouring lands at least 30 days before understanding specified forest management activities that may pose a threat of harm to the environment or private or Government property or that the Government may wish to track for statistical purposes. (2) Within 20 days after receiving notice of a proposed activity under this section, upon finding that the proposed activity is likely to cause unreasonable damage to the environment or private or Government property, the Government may issue a written order to the owner or occupier of a land to alter or to refrain from the proposed activity to prevent or minimize such damage.

Restricted activities

38C. (1) The Government may make rules to prohibit, restrict or require a permit for land clearing use of pesticides, harvest on steep stopes, or other forest management activities on private land that may pose a threat to property, renewable natural resources or the productivity of land. (2) The Government shall empower Forest-officers to issue such permits required under sub-section (1).

Abetment of forest nuisances

38D. (1) Upon a finding that conditions on a land pose a risk of disease, insect outbreak fire or other harm to nearby renewable natural resources, the Government may issue a written order to the owner or occupier of the land to abate such a nuisance within 30 days, or sooner as may be specified in the notice, if the protection of renewable natural resources demands. (2) To be effective, an order under sub-section (1) must be delivered personally to the owner or occupier of the land or sent to him by registered post with acknowledgement receipt due, or if the address of the person is unknown, affixed conspicuously at least two locations on the property. (3) If the owner or the occupier fails to comply with an order under this section, the Government may enter the land, remove the nuisance and realize compensation as a public demand.]

The duty on timber and other forest-produce

Power to impose duty on timber and other forest produce

39. (1) The Government may levy a duty in such manner, at such places and at such rates as it may declare by notification in the official Gazette on all timber or other forest-produce (a) which is produced in Bangladesh, and in respect of which the Government has any right; (b) which is brought from any place outside Bangladesh or is transported from or to any place within Bangladesh. (2) In every case in which such duty is directed to be levid ad valorem, the Government may fix by like notification the value on which such duty shall be assessed.

Limit not apply to purchase money for royalty

40. Nothing in this Chapter shall be deemed to limit the amount, if any, chargeable as purchase-money or royalty on any timber or other forest-produce, although the same is levied on such timber or produce while in transit, in the same manner as duty is levied.

THE CONTROL OF TIMBER AND OTHER FOREST-PRODUCE IN TRANSIT

Power to make rules to regulate transit of forest-produce

41. (1) The control of all rivers and their banks as regards the floating of timber, as well as the control of all timber and other forest-produce in transit by land or water, is vested in the Government, and it may make rules to regulate the transit of all timber and other forest-produce. (2) In particular and without prejudice to the generality of the foregoing power such rules may (a) prescribe the routes by which alone timber or other forest-produce may be imported, exported or moved into, from or within 36[Bangladesh]; (b) prohibit the import or export or moving of such timber or other produce without a pass from an officer duly authorized to issue the same, or otherwise than in accordance with the conditions of such pass; (c) provide for the issue, production and return of such passes and for the payment of fees thereof; (d) provide for the stoppage, reporting, examination and marking of timber or other forest-produce in transit, in respect of which there is reason to believe that any money is payable to the Government on account of the price thereof or on account of any duty, fee, royalty or charge due thereon, or, to which it is desirable for the purposes of this Act to affix a mark; (e) provide for the establishment and regulation of depots to which such

timber or other produce shall be taken by those in charge of it for examination, or for the payment of such money, or in order that such marks may be affixed to it; and the conditions under which such timber or other produce shall be brought to, stored at and removed from such depots;

(f) prohibit the closing up or obstructing of the channel or banks of any river used for the transit of timber or other forest-produce, and the throwing of grass, brushwood, branches or leaves into any such river or any act which may cause such river to be closed or obstructed; (g) provide for the prevention or removal of any obstruction of the channel or banks of any such river, and for recovering the cost of such prevention or removal from the person whose acts or negligence necessitated the same; (h) prohibit absolutely or subject to conditions, within specified local limits, the 37[establishment of wood based industries including saw-mils, saw-pits, furniture marts and brick-fields], the converting, cutting, burning, concealing or making of timber, the altering or effacing of any marks on the same, or the possession or carrying of marking hammers or other implements used for

marking timber; (i) regulate the use of property marks for timber, and the registration of such marks; prescribe the time for which such registration shall hold good; limit the number of such marks that may be registered by any one person, and provide for the levy of fees for such registration. (3) The Government may direct that any rule made under this section shall not apply to any specified class of timber or other forest-produce or to any specified local area.

Omitted

[Omitted by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973).]

Penalty for breach of rules made under section 41

42. (1) The Government may be such rules prescribe as penalties for the contravention thereof imprisonment for a term which may extend to 39[three years and shall not be less than two months and shall also be laible to fine which may extend to ten thousand Taka and shall not be less than two thousand Taka]. (2) Such rules may provide there penalties which are double of those mentioned in sub-section (1) may be inflicted in cases where the offence is committed after sunset and before sunrise, or after preparation for resistance to lawful authority, or where the offender has been previously convicted of a like offence.

Government and Forest-officers not liable for damage to forest-produce at depot

43. The Government shall not be responsible for any loss or damage which may occur in respect of any timber or other forest-produce while

at a depot established under a rule made under section 41, or while detained elsewhere, for the purposes of this Act; and no Forest-officer shall be responsible for any such loss or damage, unless he causes such loss or damage negligently, maliciously or fraudulently.

All persons bound to aid in case of accident at depot

44. In case of any accident or emergency involving danger to any property at any such depot, every person employed at such depot, whether by the Government or by any private person, shall render any assistance to any Forest-officer or Police-officer demanding his aid in averting such danger or securing such property from damage or loss.

The collection of drift and stranded timber

Certain kinds of timber to be deemed property of Government until title thereto proved, and may be collected accordingly

45. (1) All timber found adrift, beached, stranded or sunk; all wood or timber bearing marks which have not been registered in accordance with the rules made under section 41, or on which the marks have been obliterated, altered or defaced by fire or otherwise; and in such areas as the Government directs, all unmarked wood and timber; shall be deemed to be the property of Government, unless and until any person establishes his right and title thereto, as provided in this Chapter. (2) Such timber may be collected by any Forest-officer or other person entitled to collect the same by virtue of any rule made under section 51, and may be brought to any depot which the Forest-officer may notify as a depot for the reception of drift timber. (3) The Government may, by notification in the official Gazette exempt any class of timber from the provisions of this section.

Notice to claimants of drift timber

46. Public notice shall from time to time be given by the Forest-office of timber collected under section 45. Such notice shall contain a description of the timber, and shall require any person claiming the same to present to such officer, within a period not less than two months from the date of such notice, a written statement of such claim.

Procedure on claim preferred to such timber

47. (1) When any such statement is presented as aforesaid, the Forest-officer may, after making such inquiry as he thinks fit, either reject the claim after recording his reasons for so doing, or deliver the timber to the claimant. (2) If such timber is claimed by more than one person, the Forest-officer

may either deliver the same to any of such persons whom he deems entitled thereto, or may refer the claimants to the Civil Courts, and retain the timber pending the receipt of an order from any such Court for its disposal. (3) Any person whose claim has been rejected under this section may, within three months from the date of such rejection, institute a suit to recover possession of the timber claimed by him; but no person shall recover any compensation or costs against the Government, or against any Forest-officer on account

of such rejection, or the detention or removal of any timber, or the delivery thereof to any other person under this section. (4) No such timber shall be subject to process of any Civil, Criminal or Revenue Court until it has been delivered, or a suit has been brought, as provided in this section.

Disposal of unclaimed timber

48. If no such statement is presented as aforesaid, or if the claimant omits to prefer his claim in the manner and within the period fixed by the notice issued under section 46, or on such claim, having been so preferred by him and having been rejected, omits to institute a suit to recover possession of such timber within the further period fixed by section 47,the ownership of such timber shall vest in the Government, or, when such timber has been delivered to another person under section 47, in such other person free from all encumbrances not created by him.

Government and its officers not liable for damage to such timber

49. The Government shall not be responsible for any loss or damage which may occur in respect of any timber collected under section 45, and no Forest-officer shall be responsible for any such loss or damage, unless he causes such loss or damage negligently, maliciously or fraudulently.

Payments to be made by claimant before timber is delivered to- him

50. No person shall be entitled to recover possession of any timber collected or delivered as aforesaid until he has paid to the Forest-officer or other person entitled to receive it such sum on account thereof as may be due under any rule made under section 51.

Power to make rule and prescribe penalties

51. (1) The Government may make rules to regulate the following matter, namely:- (a) the salving, collection and disposal of all timber mentioned in section 45; (b) the use and registration of boats used in salving and collecting timber;

(c) the amounts to be paid for salving, collecting, moving, storing or disposing of such timber; and (d) the use and registration of hammers and other instruments to be used for marking such timber. (2) The Government may prescribe, as penalties for the contravention

of any rules made under this section, imprisonment for a term which may extend to 40[three years and shall not be less than two months and shall also be laible to fine which may extend to ten thousand Taka and shall not be less than two thousand Taka].

Seizure of property liable to confiscation

52. (1) When there is reason to believe that a forest-offence has been committed in respect of any forest-produce, such produce, together with all tools, 41[vessels], vehicles or cattle used in committing any such offence, may be seized by any Forest-officer or Police-officer 42[or any other officer authorized in this behalf by or under any other law inforce]. 43[(1a) Every officer other than a Forest-officer seizing any property under this section shall hand over all the seized property mentioned under sub-section (1) along with the accused to the nearest forest-office for further legal proceedings: Provided that police-officers need not hand over the accused to the nearest forest-office but shall inform such forest-office of the arrest.] (2) Every officer seizing any property under this section shall place on such property a mark indicating that the same has been so seized, and shall, as soon as may be, make a report of such seizure to the Magistrate having jurisdiction to try the offence on account of which the seizure has been made: Provided that, when the forest-produce with respect to which such offence is believed to have been committed is the property of Government, and the offender is unknown, it shall be sufficient if the officer makes, as soon as may be, a report of the circumstances to his official superior.

Power to release property seized under section 52

53. Any Forest-officer of a rank not inferior to that of a Ranger who, or whose subordinate, has seized any tools, 44[vessels], vehicles or cattle under section 52, may release the same on the execution by the owner thereof of a bond for the production of the property so released, if and when so required, before the Magistrate having jurisdiction to try the offence on account of which the seizure has been made.

Procedure thereupon

54. Upon the receipt of any such report, the Magistrate shall, with all convenient dispatch, take such measures as may be necessary for the arrest and trial of the offender and the disposal of the property according to law.

Forest produce, tools, etc when liable to confiscation

55. (1) All timber or forest-produce which is not the property of Government and in respect of which a forest-offence has been committed, and all tools, boats, vehicles and used in committing any forest-offence, shall be liable to confiscation. (2) Such confiscation may be in addition to any other punishment prescribed for such offence.

Disposal on conclusion of trial for forest-offence of produce in respect which it was committed

56. When the trial of any forest-offence is concluded, any forest-produce in respect of which such offence has been committed shall, if it is the property of Government or has been confiscated, be taken charge of by a Forest-officer, and, in any other case, may be disposed of in such manner as the Court may direct.

Procedure when offender not known, or cannot be found

57. When the offender is not known or cannot be found the Magistrate may, if he finds that an offence has been committed, order the property in respect of which the offence has been committed to be confiscated and taken charge of by the Forest-officer, or to be made over to the person whom the Magistrate deems to entitled to the same:- Provided that no such order shall be made until the expiration of one month from the date of seizing such property, or with out hearing the person, if any, claiming any right thereto, and the evidence, if any, which he may produce in support of his claim.

Procedure as to perishable property seized under section 52

58. The Magistrate may, notwithstanding anything herein before contained, direct the sale of any property seized under section 52 and subject to speedy and natural decay, and may deal with the proceeds as he would have dealt with such property if it had not been sold.

Appeal from orders under section 55, section 56, or section 57

59. The officer who made the seizure under section 52, or any of his official superiors, or any person claiming to be interested in the property so seized, may, within one month from the date of any order passed under section 55, section 56 or section 57, appeal therefrom to the Court to which orders made by such Magistrate are ordinarily appealable, and the order passed on such appeal shall be final.

Property when to vest in Government

60. When an order for the confiscation of any property has been passed under section 55 or section 57, as the case may be, and the period limited by section 59 for an appeal from such order has elapsed, and no such appeal has been preferred, or when, on such an appeal being preferred, the Appellate Court confirms such order in respect of the whole or a portion of such property, such property or such portion thereof, as the case may be, shall vest in the Government free from all incumbrances.

Saving of power to release property seized

61. Nothing herein before contained shall be deemed to prevent any officer empowered in this behalf by the Government from directing at any time the immediate release of any property seized under section 52.

Punishment for wrongful seizure

62. Any Forest-officer or Police-officer who vexatiously and unnecessarily seizes any property on pretence of seizing property liable to confiscation under this Act shall be punishable with imprisonment for a term which may extend to 45[one year and shall not be less than one month and shall also be liable to fine which may extend to ten thousand Taka and shall not be less than two thousand Taka].

Penalty for counterfeiting or defacing marks on trees and timber and for altering boundary marks

63. Whoever, with intent to cause damage or injury to the public or to any person, or to cause wrongful gain as defined in the 46[Penal Code] - (a) knowingly counterfeits upon any timber or standing tree a mark used by Forest-officers to indicate that such timber or tree is the property of the Government or of some person, or that it may lawfully be cut or removed by some person; or (b) alters, defaces or obliterates or obliterates any such mark placed on a tree or on timber by or under the authority of a Forest-officer; or (c) alters, moves, destroys or defaces any boundary-mark of any forest or waste-land to which the provisions of this act are applied, shall be punishable with imprisonment for a term which may extend to 47[seven years and shall not be less than two years and shall also be liable to fine which may extend to fifty thousand Taka and shall not be less than ten thousand Taka].

Some offence to be non-bailable

63A. Not with standing anything contained in any other law for the time being in force, a forest-offence punishable under sub-section (1A) of section 26, sub-section (1A) of section 33 and section 63 shall be non-bailable.]

Power to arrest without warrant

64. (1) Any Forest-officer or Police-officer may, without orders from a Magistrate and without a warrant, arrest any person against whom a reasonable suspicion exists of his having been concerned in any forest-offence punishable with imprisonment for one month or upwards. (2) Every officer making an arrest under this section shall, without unnecessary delay and subject to the provisions of this Act as to release on bond take or send the person arrested before the Magistrate having jurisdiction in the case, or to the officer in charge of the nearest police-station. (3) Nothing in this section shall be deemed to authorize such arrest for any act which is an offence under Chapter IV unless such act has been prohibited under clause(c) of section 30.

Power to release on a bond a person arrested

65. Any Forest-officer of a rank not inferior to that of a Ranger, who, or whose subordinate, has arrested any person under the provision of section 64, may release such person on his executing a bond to appear, if and when so required, before the Magistrate having jurisdiction in the case, or before the officer-in-charge of the nearest police-station 49[: Provided that nothing in this section shall apply in a case where the person arrested is suspected of having committed any non-bailable offence under this Act.]

Power to prevent commission of offence

66. Every Forest-officer and Police-officer shall prevent, and may interfere for the purpose of preventing, the commission of any forest-offence.

Power to try offences summarily

67. The District Magistrate or any Magistrate of the first class specially empowered in this behalf by the Government may try summarily, under the Code of Criminal Procedure, 1898, any forest-offence punishable with imprisonment for a term not exceeding50[two years], or fine not exceeding.

Appointment of forest Magistrate

67A. (1) The Government may, by notification in the official Gazette, appoint one or more Magistrate of the First Class to serve as a Forest magistrate to try offences exclusively under this Act, and also specify the territorial jurisdiction of such Magistrate. (2) Notwithstanding anything contained in any other law in force, such Forest Magistrate shall have authority to impose any penalty specified under this Act.]

Power to compound offences

68. (1) The Government may, by notification in the official Gazette, empower a Forest-officer 53[not inferior to that of a Ranger] - (a) to accept from any person against whom a reasonable suspicion exists that he has committed any forest-offence, other than an offence specified in 54[section 26 (1A) or section 33 (1A) or] section 62 or section 63, a sum of money by way compensation for the offence which such person is suspected to have committed, and (b) when any property has been seized as liable to confiscation, to release the same on payment of the value thereof as estimated by such officer 55[and verified by another officer not below to the rank of a Divisional Forest Officer]. (2) On the payment of such sum of money, or such value, of both as the case may be, to such officer, the suspected person, if in custody, shall be discharged, the property, if any, seized shall be released, and no further proceedings shall be taken against such person or property. (3) [Omitted by section 29 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990).]

Presumption that forest produce belongs to Government

69. When in any proceedings taken under this Act, or in consequence of anything done under this Act, a question arises as to whether any forest-produce is the property of the Government, such produce shall be presumed to be the property of the Government until the contrary is proved.

Prosecution of forest-offences

69A. Notwithstanding anything contained in any other law for the time being in force, the Government may empower any Forest-officer not inferior to that of a Deputy Ranger to appear, plead and conduct the prosecution on behalf of the Government before any Court in any case where a forest-offence is under trial.]

Cattle-tress-pass Act, 1871, to apply

70. Cattle trespassing in a reserved forest or in any portion of a protected forest which has been law fully closed to grazing shall be cattle doing damage to a public plantation within the meaning of section 11 of the Cattle-trespass Act, 1871, and may be seized and impounded as such by any Forest-officer of Police-officer.

Power to alter fines fixed under that Act

71. The Government, may by notification in the official Gazette, direct that, in lieu of the fines fixed under section 12 of the Cattle-trespass Act, 1871, there shall be levied 57[per day or part thereof] for each head of cattle impounded under section 70 of this Act such fines as it thinks fit, but not exceeding the following, that is to say:- 58[

Government may invest Forest-Officers with certain powers

72. (1) The Government may invest any Forest-officer with all or any of the following powers, that is to say:- (a) power to enter upon any land and to survey, demarcate and make a map of the same; (b) the powers of a Civil Court to compel the attendance of witnesses and the production of documents and material objects; (c) power to issue a search-warrant under the Code of Criminal Procedure, 1898; and (d) power to hold an inquiry into forest-offences, and, in he course of such inquiry, to receive and record evidence. (2) Any evidence recorded under clause (d) of sub-section (1) shall be admissible in any subsequent trial before a Magistrate, provided that it has been taken in the presence of the accused person.

Forest-officers deemed public servants

73. All Forest-officers shall be deemed to be public servants within the meaning of the 59 Penal Code.

Indemnity for acts done in good faith

74. No suit shall lie against any public servant for anything done by him in good faith under this Act 60 and no court may try such a public servant for a crime stemming from actions related to the public servant's official duty under this Act and occurring within the public servant's assigned geographical jurisdiction, unless the court first conducts a preliminary inquiry and verifies that there is credible evidence to support the basic elements of the complaint.

Forest-officers not to trade

75. Except with the permission in writing of the Government, no Forest-officer shall, as principal or agent, trade in timber or other forest-produce, or be or become interested in any lease of any forest or any forest or in any contract for working any forest, whether in or outside Bangladesh.

Penalties for breach of rules

77. Any person contravening any rule under this Act, for the contravention of which no special penalty is provided, shall be punishable with imprisonment for a term which may extend to 61[six month], or fine which may extend to 62[five thousand] Taka, or both.

Rules when to have force of law

78. All rules made by the Government under this Act shall be published in the official Gazette, and shall thereupon, so far as they are consistent with this Act, have effect as if enacted therein.

Additional powers to make rules

76. The Government may make rules- (a) to prescribe and limit the powers and duties of any Forest-officer under this Act; (b) to regulate the rewards to be paid to officers and informers out of the proceeds of fines and confiscation under this Act; (c) for the preservation, reproduction and disposal of trees and timber belonging to Government, but grown on lands belonging to or in the occupation private of persons; and (d) generally, to carry out the provisions of this Act .

Persons bound to assist Forest-officers and Police-officers

79. (1) Every person who exercises any right in a reserved or protected forest, or who is permitted to take any forest-produce from, or to cut and remove timber or to pasture cattle, in, such forest, and every person who is employed by any such person in such forest, and every person in any village contiguous to such forest who is employed by the 63[Government, or a local authority, or who receives emoluments from the Government or a local authority] for services to be performed to the community, shall be bound to furnish without unnecessary delay to the nearest Forest-officer or Police-officer any

information he may possess respecting the commission of, or intention to commit, any forest-offence, and shall forthwith take steps, whether so required by any Forest-officer or police-officer or not, (a) to extinguish any forest fire in such forest of which he has knowledge or information; (b) to prevent by any lawful means in his power any fire in the vicinity of such forest of which he has knowledge or information from spreading to such forest, and shall assist any Forest-officer or Police-officer demanding his aid (c) in preventing the commission in such forest of any forest-offence; and (d) when there is reason to believe that any such offence has been committed in such forest, in discovering and arresting the offender.

(2) Any person who, being bound so to do, without lawful excuse (the burden of proving which shall lie upon such person) fails (a) to furnish without unnecessary delay to the nearest Forest-officer or Police-officer any information required by sub-section (1); (b) to take steps as required by sub-section (1) to extinguish any forest fire in a reserved or protected forest; (c) to prevent, as required by sub-section (1), any fire in the vicinity of such forest from spreading to such forest; or (d) to assist any Forest-officer or Police-officer demanding his aid in preventing the commission in such forest of any forest-offence, or, when there is reason to believe that any such offence has been committed in such forest, in discovering and arresting the offender; shall be punishable with imprisonment for a term which may extend to 64[three months], or with fine which may extend to 65 [two thousand] Taka, or with both.

Failure to perform service for which a share in produce of Government forest is enjoyed

81. If any person be entitled to a share in the produce of any forest which is the property of Government or over which the Government has proprietary rights or to any part of the forest-produce of which the Government is entitled, upon the condition of duly performing any service connected with such forest, such share shall be liable to confiscation in the event of the fact being established to the satisfaction of the Government that such service is no longer so performed: Provided that no such share shall be confiscated until the person entitled thereto, and the evidence, if any, which he may produce in proof of the due performance of such service, have been heard by an officer duly appointed in that behalf by the Government.

Recovery of money due to Government

82. All money payable to the Government under this Act, or under any rule made under this Act, or on account of the price of any forest-produce, or of expenses incurred in the execution of this Act in respect of such produce, may, if not paid when due, be recovered under the law for the time being in force as if it were an arrear of land-revenue.

Lien on forest-produce for such money

83.(1) When any such money is payable for or in respect of any forest-produce, the amount thereof shall be deemed to be a first charge on such produce and such produce may be taken possession of by a Forest-officer until such amount has been paid. (2) If such amount is not paid when due, the Forest-officer may sell such produce by public auction, and the proceeds of the sale shall be applied first in discharging such amount. (3) The surplus, if any, if not claimed within two months from the date of the sale by the person entitled thereto, shall be forfeited to Government.

Land required under this Act to be deemed to be needed for a public purpose under the Acquisition and Requisition of Immovable Property Ordinance, 1982

84. Whenever it appears to the Government that any land is required for any of the purposes of this Act, such land shall be deemed to be needed for a public purpose within the meaning of 66[section 5(2) of the Acquisition and Requisition of Immovable Property Ordinance, 1982 (II of 1982)].

Recovery of penalties due under bond

85. When any person, in accordance with any provision of this Act, or in compliance with any rule made thereunder, binds himself by any bond or instrument to perform any duty or act, or covenants by any bond or instrument that he, or that he and his servants and agents will abstain from any act, the whole sum mentioned in such bond or instrument as the amount to be paid in case of a breach of the conditions thereof may, notwith-standing anything in section 74 of the Contract Act, 1872, be recovered from him in case of such breach as if it were an arrear of land revenue.

Omitted

85A. [Omitted by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973).]

86. [Omitted by section 3 and 2nd Schedule of the Bangladesh Laws (Revision and Declaration) Act, 1973 (Act No. VIII of 1973)]

1 Throughout this Act, except otherwise provided, the words `Bangladesh`, `Government` and `Taka` were substituted, for the words `Pakistan`, `Provincial Government` and `rupees` respectively by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973) 2 Sub-section

(2) was substituted, for sub-section (2) by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973)

3 Clause (4A) was inserted by section 2 of the Indian Forest (Amendment) Act, 1933 (Act No. III of 1933)

4 The words `or any land suitable for afforestation` were inserted by section 2of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990)

5 The word 'Bengali' was substituted, for the words 'the local vernacular' by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973)

6 The words 'and not more than four months' were inserted by section 3 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990)

7 The words, comma, figures and brackets 'Acquisition and Requisition of Immovable Property Ordinance, 1982 (Ordinance No. II of 1982)` were substituted, for the words, comma and figure `Land Acquisition Act, 1894` by section 4 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990)

8 The words, comma, figures and brackets `Acquisition and Requisition of Immovable Property Ordinance, 1982 (Ordinance No. II of 1982)` were substituted, for the words, comma and figure `Land Acquisition Act, 1894` by section 4 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990)

9 The comma and words, or wholly in money` were inserted by section 4 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) Section 16A was inserted by section 2 of the Forest (Amendment) Act, 2000 (Act No. X of 2000)

11 Sections 17 and 18 were substituted, for sections 17 and 18 by section 5 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 12 Sub-section (2) was substituted, for sub-section (2) by section 3 of the Forest (Amendment) Act, 2000 (Act No. X of 2000). 13 The words `the Divisional Commissioner` were substituted, for the words `the appellate officer or Court` by section 6 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 14 The words `Divisional Commissioner` were substituted, for the words `appellate officer or Court` by section 7 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 15 The words, commas, figures and brackets `Acquisition and Requisition of Immovable Property Ordinance, 1982 (II of 1982), have become vested in the Government under section 11 of that Ordinance` were substituted, for the words, commas and figures `Land Acquisition Act, 1894, have become vested in the Government under section 16 of that Act` by section 7 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990). 16 The words `cause it` were substituted, for the words `cause a translation thereof into the local vernacular` by section 8 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 17 Sub-sections (1) and (1A) were substituted, for sub-section (1) by section 9 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 18 The words `or cultivates or attempts to cultivate any land in any other manner` were inserted by section 4 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 19 The words `OF VILLAGE-FOREST AND SOCIAL FORESTRY` were substituted, for the words `OF VILLAGE-FORESTS` by section 5 of the Forest (Amendment) Act, 2000 (Act No. X of 2000). 20 Sections 28A and 28B were inserted by section 6 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 21 The words `or charland` were added by section 7 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 22 The words `or charland` were added by section 7 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 23 The words and comma `breaking up, cleaning or use` were substituted, for the words `breaking up or clearing` by section 8 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 24 The word `Bengali` was substituted, for the words `the local vernacular` by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973) 25 The words, commas and figure `and the killing or catching of elephants in such forests in areas in which the Elephants Preservation Act, 1879, is not in force` were omitted by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973) 26 Clause (4A) was inserted by section 2 of the Indian Forest (Amendment) Act, 1933 (Act No. III of 1933)

27 Sub-sections (1) and (1A) were substituted, for sub-section (1) by section 10 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 28 A semi-colon was substituted, for comma (,) at the end of clause (f) by section 9 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 29 Clause (g) was added by section 9 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 30 The words `or cultivates or attempts to cultivate any land in any other manner` were inserted by section 9 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 31 The words `or any land suitable for afforestation` were inserted by section 2of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 32 The word `Bengali` was substituted, for the words `the local vernacular` by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973) 33 The words `and not more than four months` were inserted by section 3 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 34 The words, comma, figures and brackets `Acquisition and Requisition of Immovable Property Ordinance, 1982 (Ordinance No. II of 1982)` were substituted, for the words, comma and figure `Land Acquisition Act, 1894` by section 4 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 35 Sections 38A, 38B, 38C and 38D were inserted by section 10 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 36 The word `Bangladesh` was substituted, for the words `the Province` by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973) 37 The words and commas `establishment of wood based industries including saw-mils, saw-pits, furniture-marts and brick-fields` were substituted, for the words `establishment of saw-pits` by section 11 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 38 The words, comma, figures and brackets `Acquisition and Requisition of Immovable Property Ordinance, 1982 (Ordinance No. II of 1982)` were substituted, for the words, comma and figure `Land Acquisition Act, 1894` by section 4 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 39 The words `three years and shall not be less than two months and shall also be laible to fine which may extend to ten thousand Taka and shall not be less than two thousand Taka` were substituted, for the words and commas `six months, or fine which may extend to five hundred Taka, or both` by section 12 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 40 The words `three years and shall not be less than two months and shall also be laible to fine which may extend to ten thousand Taka and shall not be less than two thousand Taka` were substituted, for the words and commas `six months, or fine which may extend to five hundred Taka, or both` by section 12 of the

Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 41 The word `vessels` was substituted, for the word `boats` by section 14 of the Forest (Amendment) Act, 1990 (Act No. VIII 42 The words `or any other officer authorized in this behalf by or under any other law inforce` were added by section 11 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 43 Sub-section (1a) was inserted by section 11 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 44 The word `vessels` was substituted, for the word `boats` by section 15 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 45 The words `one year and shall not be less than one month and shall also be liable to fine which may extend to ten thousand Taka and shall not be less than two thousand Taka` were substituted, for the words and commas `six months, or with fine which may extend to five hundred Taka, or both` by section 16 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 46 The words `Penal Code` were substituted, for the words `Pakistan Penal Code` by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973) 47 The words `seven years and shall not be less than two years and shall also be liable to fine which may extend to fifty thousand Taka and shall not be less than ten thousand Taka` were substituted, for the words and commas `two years, or with fine, or with both` by section 17 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 48 Section 63A was inserted by section 18 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 49 Colon was substituted, for the full-stop at the end of section 65 and thereafter the proviso was added by section 19 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990). 50 The words `two years` were substituted, for the words `six months` by section 20 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 51 The words `ten thousand` were substituted, for the words `five hundred` by section 20 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 52 Section 67A was inserted by section 12 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 53 The words `not inferior to that of a Ranger` were inserted by section 21 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 54 The words, figures, brackets and letters `section 26(1A) or section 33 (1A) or` were inserted by section 21 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 55 The words `and verified by another officer not below to the rank of a Divisional Forest Officer` were added by section 13 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 56 Section 69A was inserted by section 22 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 57 The words `per day or part thereof`

were inserted by section 14 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 58 The words `Taka one thousand` were substituted, for the words `ten Taka` by section 23 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 59 The words `Penal Code` were substituted, for the words `Pakistan Penal Code` by section 3 and 2nd Schedule of the Bangladesh Laws (Revision And Declaration) Act, 1973 (Act No. VIII of 1973) 60 The words `and no court may try such a public servant for a crime stemming from actions related to the public servant`s official duty under this Act and occurring within the public servant`s assigned geographical jurisdiction, unless the court first conducts a preliminary inquiry and verifies that there is credible evidence to support the basic elements of the complaint` were added by section 15 of the Forest (Amendment) Act, 2000 (Act No. X of 2000) 61 The words `six months` were substituted, for the words `one month` by section 24 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 62 The words `five thousand` were substituted, for the words `five hundred` by section 24 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 63 The words and commas `Government, or a local authority, or who receives emoluments from the Government or a local authority` were substituted, for the words and comma `Government, or who receives emoluments from the Government` by section 25 of the Forest (Amendment) Act, 1990 (Act VIII of 1990) 64 The words `three months` were substituted, for the words `one month` by section 25 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 65 The words `two thousand` were substituted, for the words `two hundred` by section 25 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990)

66 The words, figures, brackets and comma `section 5(2) of the Acquisition and Requisition of Immovable Property Ordinance, 1982 (II of 1982)` were substituted, for the words, figures and comma `section 4 of the Land Acquisition Act, 1894` by section 26 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 67 The comma and words `, or wholly in money` were inserted by section 4 of the Forest (Amendment) Act, 1990 (Act No. VIII of 1990) 68 Section 16A was inserted by section 2 of the Forest (Amendment) Act, 2000 (Act No. X of 2000)

The Places of Public Amusement Act, 1933

This Act was passed in 1933 in order to provide for the better control of certain places of public amusement. The place of public amusement means any place, enclosure, building, vessel, tent, booth, or other erection, whether permanent or temporary, where music, singing, dancing or any diversion or game or the means of carrying on the same is provided and to which the public are admitted either free or on payment of money or on any other consideration and includes a carnival circus or amusement park. No person shall without or otherwise than in conformity with the conditions of a license granted under this Act open or keep open any notified place of public amusement. This Act is maintaining the social environment for peaceful human recreations.

The Dock Laborers Act, 1934

This Act was passed in 1934 for providing safety of dockworkers from any accidents of in loading and unloading ships. In this regard, the Government may make rules under this Act for providing the safety in working places on shore, and of any regular approaches over a dock, whakf, quay or similar premises which works have to use for going to or from a working place at which he process are carried on and for the lighting and fencing of such places and approaches. This Act is for safety of dockworkers from any dangerous approaches of work, any situation in working place, which might cause accident, or any unexpected situation that is harmful or risky or hazardous to workers in the dock. The main purpose of this Act is to keep sound and healthy environment in the dock and in other places of seaport.

The Tanks Improvement Act, 1939

There are many small or big tanks in rural areas of Bangladesh. Most of them are private ownership. These tanks are almost remained vacant or useless because of the different problematic situations like ownership, grouping *etc*. However, the Government of Bangladesh enacted this law addressing those problems and also ensuring the rural economy of Bangladesh. For ensuring and sustainable use of this tank, the Tank Improvement Act is enacted in 1939 and its objectives are to provide for the improvement of tanks for purposes of irrigation and pisciculture. In this Act, definitions of collector, agricultural land, and the tank are given. 'Agricultural land' includes land used for the growing of vegetable and the link and also wastes land, which is capable of cultivation

but does not include a fruit garden, an orchard or any homestead land. 'Collector' includes a Thana Nirbahi Officer and any officer appointed by the Government to exercise all or any of the functions of a Collector under this Act. 'Tank' means a reservoir or place which has been used as a reservoir, for the storage of water whether formed by excavation, for the storage of water whether formed by excavation or by the construction of water whether formed by excavation or by the construction of one or more. If the Collector deems that, any tank is fallen into disrepair or disuse, the owner may serve a notice in the prescribed form and manner on the person having control over the tank.

The Drugs Act, 1940

This Act was passed in 1940 in order to control drug and also to regulate the import, export, manufacture, distribution and sale of drugs. Drug includes all medicines for internal or external use of human beings or animals and all substances intended to be used for or in the treatment of mitigation or prevention of diseases in human beings or animal, or being medicines and substances exclusively used or prepared for use in accordance with Ayurvedic, Unani, homeopathic or Biochemic systems of medicine. Under this Act, administration of drugs such as medicines for internal or external use of human beings or animals and all substances, patent, any branded and misbranded drugs has been included for regulating drug and drug substances for better public health.

3.2.2 Pakistan Period

After independence of Pakistan from British Empire, laws, legislations, *etc.* are inherited from British ruler, which helped to further development of laws and legislations in different aspect and environmental laws as well for conserving and developing environment and its resources. The environmental law has been developed, changed and amended gradually from British to Pakistan period. It is observed that there are 40 different kinds of environmental legislation on different environmental issues. Among them public health and safety matters, land use, and land use planning, various forms of pollution control *etc.kj;* are given priority. The legislation in Pakistan period is discussed in this section.

The Protection and Conservation of Fish Act, 1950

This Act was enacted during the Pakistan period by the Pakistan National Assembly on 3rd March 1950 aiming at the protection and conservation 40 of fish and fish species. It was published through the Dhaka Gazette on 18th May 1950; objectives and reasons to enactment of this Act are published in 14th April 1948 (Dhaka Gazette, Extra Ordinary, dated 14th April, 1948, part IV page-4). The Government has made the date of enforcement of this Act from 29th June 1950 through the Gazette notification (Vide notification No. 5459 Fish, dated the 22nd June 1950, published in Dhaka Gazette, dated the 29th June, 1950, part I page 530). This Act is already amended for several times. These amendments are made considering the definitions of fish and fish species, aquatic environment, province and procedure for disposal of forfeited fish, punishment *etc.* Later on, the Rules of this Act also amended which is passed as the Protection and Conservation of Fish Rule, 1985 in order to exercise of the powers conferred by section 3 of this Act. Specific definitions of fish are given in this Rules that did not make in earlier. Under this Act, some restrictions are also made on fishing through the Gil net in 2002.

The East Bengal Acquisition of Waste Land Act, 1950

This Act emphasizes on acquisition of wasteland mainly for cultivation and food production and for which irrigation scheme is included without giving emphasize on fish production. The wasteland may include water bodies for food production other than the fish culture, which may cause the shrinkage of fish habitat. This practice may affect adversely on the fish production.

The Building Construction Act, 1952

The Building Construction Act was passed in 1952 in order to provide for the prevention of haphazard construction of building and excavation of tanks, which are likely to interfere with the planning of certain areas in the then East Pakistan. Under this Act, some restrictions such as restriction on construction of building and excavation of tank, restriction on improper use of lands and buildings and restriction on cutting of hills and directions for removal of construction are imposed upon for building construction. This Act is for regulating the unplanned constructions, which is harmful for environment. Besides, the building codes are followed nominal. Here “building” includes a house, out-house, hut, wall and any other structure whether of masonry, bricks, corrugated iron sheets, metal, tiles, wood, bamboos, mud, leaves, grass, thatch or any other material whatsoever.

The Embankment and Drainage Act, 1952

This Act was passed in order to consolidate the laws relating to embankment and drainage and to make better provisions for the construction, maintenance, and management, removal and control of embankments and watercourse for the better drainage of lands and for their protection from floods, erosion or other damage by water. Under this Act, the Embankment, Land, Owner, Public Embankment and Watercourse is given definition respectively. Here "Embankment" includes every bank, dam, wall and dyke made or used for excluding water from of for excluding water from of for retaining water upon any land; every sluice, spur, groined, training wall, beams or other work annexed to or portion of, any such embankment; every bank, dam, dyke, wall, groined or spur made or executed for the protection of any such embankment or of any land from erosion or over flow by or of rivers, tides, waves or water; and also all buildings intended for purposes of inspection and supervision, but does not include any ail or ridge surrounding or dividing a field or any public or private road.

The Town Improvement Act, 1953

The Town Improvement Act was passed in 1953 for developing environmentally sound rural and urban planning. It is an Act to provide for the development, improvement and expansion of the towns of Dhaka and Narayangonj and certain areas in their vicinity and the constitution of a Kartripakkha. Under this Act, the vital issues for town improvement such as any building in any area which are used or are intended to be used as laces, are unfit for human habitation, danger to the health of the inhabitants of buildings in any area or in the neighboring buildings is caused by the narrowness, closeness, bad arrangement, condition of streets, or buildings or groups of buildings in such area or the want of light, air, ventilation or proper conveniences as are preserved.

THE ANIMALS SLAUGHTER (RESTRICTION) AND MEAT CONTROL ACT, 1957

(EAST PAKISTAN ACT NO. VIII OF 1957)

Short title, extent and commencement

1) This Act may be called the Animals Slaughter (Restriction) and Meat Control Act, 1957.
2) It extends to the whole of [3][Bangladesh].
3) It shall come into force at once.

Definitions

1. In this Act, unless there is anything repugnant in the subject or context,-

    a. "animal" means any bull, bullock, cow, ox, heifer, [4][calf, buffalo, goat and sheep];

    b. "carcase" means the dead body or any portion of the dead body of an animal as defined in clause (a);

    c. "catering establishment" means any hotel, restaurant, eating house, cafe, canteen, and includes any other place of a like nature open to the public or to any limited class of the public where meat in any form is consumed or procurable;

    d. "meat" means the flesh or other edible portion of any animal which has been slaughtered in a slaughter-house as defined in clause (f) ;

    e. "prohibited day" means a day on which the slaughter of animal and the sale of meat thereof is prohibited by the Government by notification in the official Gazette; and

    f. "slaughter-house" means any place used for the slaughter of any animal for the purpose of selling the flesh thereof as meat or otherwise, but excludes any slaughter-house belonging to or maintained by the [5][Armed Forces of Bangladesh.

No slaughter of animal or sale of flesh or meat on prohibited day

(1) No person shall, during the period of 24 hours commencing at sunset on the day immediately preceding the prohibited day, slaughter any animal at any slaughter-house or at any other place for the sale of its meat.

(2) No person shall on any prohibited day sell or expose for sale any meat at any market or other place.

Restriction on supply and sale in the catering establishment

4. No owner, Manager or person in charge of or having control of any catering establishment shall on a prohibited day sell or expose for sale or serve, supply or cause to be served, supplied or sold any food containing meat in such catering establishment.

Restrictions on slaughter of animals

5. No person shall slaughter or cause or permit to be slaughtered or offer for slaughter in a slaughter-house-

a. a she-goat or ewe below the age of two years or any other female animal below the age of three years;

b. a he-goat, ram or lamb of or below the age of one year or any other male animal of or below the age of seven years, if such animal is used or is capable of being used for draught or breeding purposes;

c. a she-goat or ewe of or below the age of five years or any other female animal of or below the age of ten years, if such animal is not unsuitable for bearing offspring and is capable of producing milk; or

d. any female animal which is pregnant or is in milk: Provided that nothing in this section shall apply to any animal which on account of any bodily injury, illness or other infirmity is certified in writing by an officer of the [7] Directorate of Livestock Services not below the rank of Thana Livestock Officer,

(i) in the case of an animal falling under clause (a), to be unlikely to live or to be fit for any of the purposes enumerated in clauses (b) or (c) as the case may be;

(ii) in the case of an animal falling under clauses (b) or (c), to be unfit for the purposes respectively enumerated therein; and

(iii) in the case of an animal falling under clause (d), to be unfit to be allowed to remain pregnant or produce milk:

Provided further that if any such certificate is proved to have been procured through fraud or collusion it will be treated as invalid and the officer giving such certificate shall be severely dealt with.

Power of authorised Officer

6. (1) Any Officer authorised by Government by notification in the official Gazette in this behalf may-

a. at any time enter and inspect any place used or believed to be used for the slaughter of animals for the purpose of selling or consuming the meat thereof or any place where meat is sold or exposed for sale or where any food containing meat is served, supplied or sold if there is reason to believe that meat has been or is being served, supplied, sold or exposed for sale in such place in contravention of the provisions of this Act;

b. seize any animal or the carcase thereof found in such place, or any meat, receptacle, covering in which such meat is found or any other article by means of which he has reason to believe that contravention of any provision of the Act has been or is being or is likely to be committed;

c. require the owner, Manager or person in charge or control of any slaughter-house or of any catering establishment to furnish such information as may be necessary for the purpose of securing compliance with this Act.

(2) The Officer taking action under sub-section (1) of this section shall immediately report the matter to the nearest Magistrate having jurisdiction to enquire into or try the case or to the Officer-in-charge of the nearest police-station who on receiving such report shall have the same powers of investigation as he may exercise in a cognizable case, but shall not arrest without warrant:

Provided that the Officer-in-charge or any other officer exercising any power under this Act shall have the power to dispose of any carcase by sale or otherwise as may appear to him to be most suitable if he is satisfied that the carcase is liable to speedy decay.

(3) The report of the officer-in-charge mentioned in sub-section (2), submitted to the Magistrate shall be deemed to be a report under clause (b) of sub-section (1) of section 190 of the Code of Criminal Procedure, 1898.

Penalty

7. If any person contravenes any provisions of this Act,-

a. he shall on conviction by a competent Court be punishable with imprisonment of either description for a term which may extend to 6 months or with fine not exceeding [8][Taka 1000] or with both.

b. without prejudice to the punishment referred to in clause (a), any Court trying the offence may order that any animal or the carcase of such animal in respect of which the Court is satisfied that the offence has been committed, shall be forfeited to the Government and disposed of by sale or otherwise as may be prescribed.

Deposit of sums

8. All sums realised under sub-section (2) of section 6 or under section 7 shall be deposited in the Government Treasury in such manner as may be prescribed.

Exceptions

9. (1) Nothing in this Act shall apply to animals slaughtered or to be slaughtered-

a. on the day of Id-uz-Zoha and Id-ul-Fitre and the two days succeeding each of those festivals, or

b. for preparation of goat tissue vaccine or for any other research work in the vaccine and research laboratories of the Directorate of Livestock Services.

c. The Government may from time to time prescribe such other occasions in relation to which any or all of the provisions of this Act shall not apply.

Rules

10. The Government may make rules to give effect to the provisions of this Act.

Public servant

11. Any person empowered to perform any function under this Act shall be deemed to be a public servant within the meaning of section 21 of the.

Indemnity

12. (1) No Civil or Criminal proceeding shall lie against any person for anything done or intended to be done in good faith under this Act.

(2) No proceeding shall lie against the Government for any action taken under this Act.

Repealed

13. [Repeal and saving.- Repealed by section 3 and the Second Schedule of the East Pakistan Repealing and Amending Ordinance, 1966 (East Pakistan Ordinance No. XIII of 1966).

Throughout this Act, the word "Government" was substituted for the words "Provincial Government" by section 2 of the Animals Slaughter (Restriction) and Meat Control (Amendment) Ordinance, 1983 (Ordinance No. XVIII of 1983) The words "East Pakistan" were omitted by section 3 of the Animals Slaughter (Restriction) and Meat Control (Amendment) Ordinance, 1983 (Ordinance No. XVIII of 1983)

The words "Bangladesh" were substituted for the words "East Pakistan" by section 3 of the Animals Slaughter (Restriction) and Meat Control (Amendment) Ordinance, 1983 (Ordinance No. XVIII of 1983)

The words and commas "calf, buffalo, goat and sheep" were substituted for the words "calf and buffalo" by section 4 of the Animals Slaughter (Restriction) and Meat Control (Amendment) Ordinance, 1983 (Ordinance No. XVIII of 1983) The words "Armed Forces of Bangladesh" were substituted for the words "Pakistan State Forces" by section 4 of the Animals Slaughter (Restriction) and Meat Control (Amendment) Ordinance, 1983 (Ordinance No. XVIII of 1983)

Clauses (a), (b) and (c) were substituted by section 5 of the Animals Slaughter (Restriction) and Meat Control (Amendment) Ordinance, 1983 (Ordinance No. XVIII of 1983)

The words "Directorate of Livestock Services not below the rank of Thana Livestock Officer" were substituted for the words "East Pakistan Directorate of Animal Husbandry not below the rank of Assistant Animal Husbandry Officer" by section 5 of the Animals Slaughter (Restriction) and Meat Control (Amendment) Ordinance, 1983 (Ordinance No. XVIII of 1983)

The word and figure "Taka 1000" were substituted for the letters and figure "Rs. 200" by section 6 of the Animals Slaughter (Restriction) and Meat Control (Amendment) Ordinance, 1983 (Ordinance No. XVIII of 1983)

Sub-section (1) was substituted by section 7 of the Animals Slaughter (Restriction) and Meat Control (Amendment) Ordinance, 1983 (Ordinance No. XVIII of 1983)

The word "Pakistan" was omitted by section 8 of the Animals Slaughter (Restriction) and Meat Control

The Inland Water Transport Authority Ordinance, 1958

This Ordinance was passed in 1958 for development, maintenance and control of inland water transport and of certain inland navigable waterways. Under this Ordinance, it has an authority to be known the `Pakistan Inland Water Transport Authority', now known as Bangladesh Inland Water Transport Authority, for carrying out the purposes of this Ordinance. The Authority may perform the functions such as carry out river conservancy works, disseminate navigational and meteorological information including publishing river charts, maintain pilot age and hydrolographic survey services, develop, maintain and operate inland river ports, landing chats, removal of wrecks and obstruction in inland navigable waterways *etc.* Navigable waterways such as rivers, channels, other water bodies *etc.* are conserving and developing for inland navigation through this Ordinance which is also environmentally very important for the country.

The Displaced Persons (Land Settlement) Act, 1958

It is an Act to provide for the permanent settlement of displaced persons on land and for matters incidental thereto or connected therewith. The Government or on behalf of the Government, subject to the provisions of this Act, shall prepare one or more schemes for allotment to displaced persons against their verified claims of land in the compensation pools constituted under section-5. Under this Act, 'Land' means evacuee property consisting of land held for agricultural purposes or for purposes subservient to agriculture or for pasture including gardens non surveyed land and trees or buildings and other structures standing thereon and includes all rights of evacuees in such land, and 'Settlement' means conferment on a displaced person of any permanent right in or title to, any land under this Act, whether such right of title be property, occupancy, tenancy or of any other kind. The Chief Settlement Officer makes all allotments to the displaced persons concerned with any of the schemes.

The Cattle (Prevention of Trespass) Ordinance, 1959

It is, an Ordinance relating to trespass and damage of crops by cattle. Under this Act, any officer may take charge of any cattle, which may be found straying in any street or trespassing on any land and doing damage thereto or to the crop or produce thereon and may take or send the same to the nearest pound. This Act has been enacted for the supplementary of the Cattle Trespass Act of 1871.

The Culturable Waste Land (Utilization) Ordinance, 1959

The Culturable Waste Land (Utilization) Ordinance (1959) was passed for land use planning in sustainable ways for optimum utilization of culturable wasteland in the country. The culturable wasteland means any land classified in the record of rights published under or the State Acquisition and Tenancy Act, 1950, as nutan patit (new fallow land), puratan patit (conventional fallow land), layek patit garlayek patit or layek jangal. It includes any land which, in the opinion of the Collector, has not been cultivated during the last two preceding years and no preparation for its cultivation is made on the day of making a declaration under section 3, but does not include any land forming part of, or conterminous with, any homestead, farm house or any place worship.

The Private Forests Ordinance, 1959

This Ordinance was passed in 1959 in order to provide for the conservation and development of private forests and for the afforestation in certain cases of wastelands in the country. This Act includes necessary arrangements or plans for the private forest. The government may help to the owner of the private forest for developing these forests and its resources. The owner shall carry out all terms and conditions in the working plans and to formulate working committee for the implementation of the working plan and also land management should be made suitable to a forestation. Any wasteland which is lying uncultivated for not less than three years is suitable for a forestation and that the owner of such land is unwilling or unable to cultivate it by growing therein agricultural crops, or to use it for the purposes of horticulture to the satisfaction of such officers or to arrest it that should be executed by the Government. This Ordinance is originated from the Forest Act 1927 for better management and development of the private forest in the country.

The Forest Industries Development Corporation Ordinance, 1959

This Ordinance was passed in 1959 in order to establish a corporation for the purpose of promoting and developing the forest industries in the country aiming at the proper utilization of timber as viable forest resource. Under this Ordinance, the Government shall establish a corporation to be called "The Forest Industries Development Corporation" and under the corporation a 'Board' to be formed to exercise all powers and do all acts and things which may be exercised or done by the Corporation. The board in discharging its functions shall act on commercial considerations and shall be guided on questions of policy involving the national interest.

The Government Fisheries (Protection) Ordinance, 1959

This Act was passed in order to prevent the unauthorized fishing in government control and management fishery. The Government may, by notification in the Official Gazette, declare any fishery belonging to, or under the management and control of the Government to be a khas managed fishery. In this Ordinance, no person shall catch fish in the fisheries without valid license for fishing.

The authority, authorized by the Government, shall provide license for the management and control of the khas managed fishery. The government shall fix different rates of license fees for fishing in a khas managed fishery with different varieties of fishing contrivances or by using different methods of fishing and to lay down the terms and conditions of any license. Under section 5, every person fishing in any manner or carrying any fishing contrivance in a khas managed fishery shall carry with him a valid license for fishing in such manner or with such contrivance and produce the same when required by such person or class of persons as may be prescribed. Under section 6, no person shall or attempt- to fish in any fishery, other than khas managed fishery, belonging to or under the management and control of, the Government or enter into any such fishery for the purpose of fishing or causing fishing to be done, without the author ity of the Government or of any license of the Government. Under section 9, contravention of any provision of this ordinance or any rules made there under shall, on conviction by a Court of competent jurisdiction, be punishable with imprisonment which may extend to 2 years or fine which may extend to BD Tk.5000/= or With both and any fish or fishing contrivance including any boat m3y forfeited to the Government.

The Agricultural Development Corporation Ordinance, 1961

Under this Ordinance, 'Bangladesh Agricultural Development Corporation' was established for increasing agricultural production in Bangladesh. The main functions of this corporation are: (i) to make suitable arrangements throughout Bangladesh, on a commercial basis, for the procurement, transport, storage and distribution to agriculturalists of essential supplies such as seed, fertilizers, plant protection equipment, pesticides and agricultural machinery, (ii) to promote the setting up of co-operative societies with a view to handling over them its supply functions in accordance with a phased program, (iii) to take over and manage the seed multiplication and livestock

breeding forms and fruits nurseries, (iv) to assist, encourage and promote the manufacture of improved agricultural machinery and implements, (v) to organize the supply, maintenance and operation of lift-pumps and tube-wells and setup light workshops for running repair, (vi) to encourage the expansion and improvement of industries for the manufacture, of diesel engines used in agriculture, the setting, of cold storage plants, the renewal and establishment of gunneries, oil expellers, jute presses and rice huskers, (vii) to help the government for formulating the sugarcane policy and to give suggestion related to any subject about sugarcane, *etc.*

The Agricultural Pests Ordinance, 1962

The Agricultural Pests Ordinance was passed in 1962 in order to provide for the prevention of spread of agricultural pests in Bangladesh. In this Ordinance, 147 'agricultural pest' means a pest, insect or weed mentioned in the Schedules I, II, III and IV of this ordinance. 'Crops' include all agricultural or horticultural crops and all trees, bushes, or plants. 'Infested Crop' means a crop affected by any agricultural pests. 'Occupier' means the person in actual possession of land and includes the manager or managing agent or bargadar or any other person authorized by the occupier. 'Preventive measures' means the measures prescribed by the Government to eradicate and to prevent the spread of any agricultural pests.

The Prevention of Interference with Aids to Navigable Waterways Ordinance, 1962

This Ordinance was passed in 1962 in order to provide for punishment for interfering with the marks, buoys, light, *etc.*, installed on the inland waterways in Bangladesh. Under the Ordinance, aids to navigation bring significance in the implementation of this Ordinance. The 'aids to navigation' means marks, buoys, lights, bandals and other, contrivances installed for conservancy of channels and aids to navigation by the Authority. Whenever it appears to the Authority that any act causing or likely to cause wrongful damage to, or any act of wrongful removal of, any of the aids to navigation, or by doing any act which renders any of the aids to navigation less useful as such, and whoever abets such mischief shall be punished. Under this Ordinance, all sorts of prevention of interference with Aids to navigable waterways have been ensured for regulating safe atmosphere in this line.

The Society for the Privation of Cruelty to Animals Ordinance, 1962

Purposes of this Ordinance are to prevent the animals especially the domestic animals from any kind of cruelty so that the animal rights can be established. It shall be constituted a society to be known as "the Society for the Prevention of Cruelty to Animals." The Governor of the East Pakistan (now Bangladesh) shall be the chairperson of the society and the first member thereof shall be appointed either by name or by office by the Government. The Deputy Commissioner of the district shall be the Chairman of the branch society in all districts. The functions of the society shall include the arrangement for the proper treatment and care of animals, the education of the general public in the proper care, treatment and destruction of animals and the exercise of such powers and performance of such duties as may be prescribed by rules as suggested under the Bengal Cruelty to Animals Act, 1920.

The Agricultural Pests Ordinance 1962

The Agricultural Pests Ordinance was passed in 1962 in order to provide for the prevention of spread of agricultural pests in Bangladesh. In this Ordinance, 'agricultural pest' means a pest, insect or weed mentioned in the Schedules I, II, III and IV of this ordinance. 'Crops' include all agricultural or horticultural crops and all trees, bushes, or plants. 'Infested Crop' means a crop affected by any agricultural pests. 'Occupier' means the person in actual possession of land and includes the manager or managing agent or bargadar or any other person authorized by the occupier. 'Preventive measures' means the measures prescribed by the Government to eradicate and to prevent the spread of any agricultural pests. Under section 3, the Government may, by notification in the Official Gazette, prohibit the employment of such methods of cultivation as held the spread of agricultural pests either generally or with respect to any particular crops; or the transport or sale of any infested crop. Under section 4, every occupier of land in which any crop is cultivated shall be bound to carryout the preventive measures as may be prescribed in respect of such crop. Under section 5, the Government may, by notification, appoint such person as it thinks fit to be Inspector for the purposes of the Ordinance within such local areas as may be specified in such notification. Under section 6, an Inspector appointed under the section of 6, may subject to any rules made on this behalf by the Government.

The Factories Act, 1965

Under this Act, provisions are made for regulating the factories in the country for maintaining sound work environment in a factory. In this Act, definitions of adolescent, child, day, explosive substance, factories are given. The effective and suitable provisions such as adequate ventilation by the circulation of fresh air, walls and roofs required temperature *etc.* shall be made in every factory for securing and maintaining in every workroom. Every factory shall be kept clean and free from effluvia arising from any drain privy or other nuisance. The floor of every workroom shall be cleaned at least once in every week by washing, using disinfectant where necessary or by some other effective methods. The effective arrangements shall be made in every factory for the disposal of wastes and effluent due to the manufacturing process carried on therein.

3.2.3 Bangladesh Era (1971-2012)

Like all other nations of the world Bangladesh also acted to the global call for the protection and conservation of natural environment and ecology. The people of Bangladesh who could not afford to introduce modern technological benefits in many respect responded to the need with limited resources and their own environment friendly indigenous technologies and wisdom.

Bangladesh as well as other countries of the Indian subcontinent holds the similar laws in all aspects inherited from the British ruler. After the independent in 1971, Government of Bangladesh tried to develop its law and order situation for the development of the country. Laws for the environmental conservation and development are enacted like other sectors of the country though as a newborn country, Bangladesh faced several problems such as food shortage, infrastructure, law and order situation, political unrest, unemployment, scarcity of resources and capital and so on. The government of Bangladesh had taken some important initiatives such as enactment of the Environment Pollution Control Ordinance, 1977 for the conservation and improvement of the environment *etc.* Later on, some other Acts and Ordinances were passed to provide legal mechanism for the development of environment in Bangladesh. But environmental problems were taken in serious consideration by the government in the 1990s. During this period, the Government enacted the landmark environmental laws in Bangladesh, because these laws are enacted considering in all aspects such as norms, values, and economic

condition *etc.* of Bangladesh. The Environment Pollution Control Ordinance, 1977 was repealed in 1995 through the landmark environmental Act called "Bangladesh Environment Conservation Act", 1995 for its inadequacy.

Principles of Environmental Laws on Biodiversity

Besides, the Government of Bangladesh has enacted and amended some other environmental laws such as: The Bangladesh Environment Conservation (Amendment) Act, 2000, the Bangladesh Environment Conservation (Amendment) Act, 2002, the Environment Conservation Rules, 1997, and its Gazette Notification, 2002, the 'Environment Court Act, 2000, the Environment Court (Amendment) Act, 2002, the Environment Court (Amendment) Act, 2003. Moreover, The Environment Policy and Action Plan, 1992) is formulated and passed by the Government of Bangladesh. The history of environmental laws in Bangladesh is briefly discussed hereby.

The Agricultural Pesticides Ordinance, 1971

The Agriculture Pesticides Ordinance was passed in 1971 and amended in 1980 and 1984 in order to regulate the import, manufacture, formulation, sale, distribution and use of pesticides. There are definitions about adulterated, advertise, brand, formulation, fungi, guarantee, insect and pesticides in this Act. "'adultered" means when used with reference to a pesticide, any pesticide the strength or purity of which falls below the professed standard or quality which is expressed on its label or under which it is sold or a pesticide any valuable ingredient of which has been wholly or partially extracted; "advertise" means to make known by publications or distribution of any advertisement, circular or other notice; "brand" means the trade name applied by an importer, manufacturer, formulator or vendor to the goods imported, manufactured or sold by him; "formulation" means the process by which a pesticide is converted, by mixing with other substances, into a form in which it is ready to be used; "fungi" means all rusts, smuts, mildews, moulds, yeasts, and similar forms of plant life prescribed in this behalf and includes bacteria affecting plant life; "guarantee" means the statement indicating the strength, effectiveness and other qualities of a brand of a pesticide which an importer, manufacturer, formulator, vendor or person holding stock for sale of a brand of a pesticide is required to submit under stock for sale of a brand of a pesticide is required to submit under the rules at the time of applying for the registration of the brand; "insect"

means any of the small invertebrate animals commonly known as insects and includes such forms of animal life as may be prescribed; "pesticide" means any substance or mixture of substance used or represented as a means for preventing, destroying repelling, mitigating or controlling, directly or indirectly, any insect, fungus, bacteria organism, nematodes, virus, weed, rodent, or other plant or animal pest but does not include a substance which is a drug within the meaning of the Drugs Act, 1940.

The Bangladesh Malaria Eradication Board Order, 1972

This Order was passed in order to provide for the establishment of a Board for eradication of malaria from Bangladesh and prevention of its reappearance therein and matters connected therewith or incidental thereto. This Board shall formulate schemes and adopt co-coordinated measures, survey of the country, medical examination, and treatment of persons, delimitation of malarious areas *etc.*, for eradication of malaria. Any person authorized by the board may apply insecticides, collect mosquitoes, check insecticides deposits, take blood films and do such other acts as are considered necessary to eradicate or prevent malaria or to collect information relating to malaria and for any such purpose enter into any premises. Similar Acts such as Vaccination Act, 1880 and Epidemic Disease Act, 1897 were enacted in British era.

The Bangladesh Inland Water Transport Corporation Order, 1972

This Order was passed in order to set up an Authority for development, maintenance and control of inland water transport and of certain inland navigable waterways in Bangladesh. Under this Order, the Authority will perform the functions such as carryout river conservancy works including river training works for navigational purposes and for provision of aids to navigation, including marks, buoys, lights semaphore signal, disseminate navigational and meteorological information, maintain pilotage and hydrographic survey services *etc.* Purposes of this Order are to facilitate, development, control etc.; of the navigations and its ways.

The Bangladesh Land Holding Limitation Order, 1972

This Order has been passed in order to provide for the reduction of maximum quantity of land that may be held by a family or a body in Bangladesh and for matters ancillary thereto. The salient features of this order are: no family or body is not entitled or to keep land not more than one (100) hundred bighas and excess of one hundred bighas land should be

surrendered to the Government; no family or body shall have the right to buy if he keeps one hundred bighas land. If he remains this land, the right of purchasing power shall be extinguished and ways of transferring shall never be applicable. The limitation of having one hundred bighas (100) shall not applicable to Wakf, debutter or any other religious or charitable purposes. The limitation of one hundred bighas land shall not applicable if he transfers the land to a co-operative society of farmers, land used for cultivation of tea, rubber or coffee or covered by orchards, an industrial concerned unconditionally.

The Statute of the Indo-Bangladesh Joint River Commission, 1972

Under Article 4, the Commission has, in particular, five functions of which four are about flood control. The remaining one is about the effective joint efforts of both the countries in maximizing the benefits from common river systems. Besides these particular functions, it shall- perform such other functions as the two Governments may by mutual agreement, direct it to do. Bangladesh has to share above 30 rivers with other neighboring countries such as India, Myanmar, and Bhutan *etc.* Since these rivers are mostly shared with India, a Joint River Commission was formed in 1972 to carry out a comprehensive survey of the river system shared by two countries. In this statute bilateral importance is given mainly to flood control, which may cause an adverse impact to the water bodies and to the living resources lying in such water bodies. Giving emphasize only on the flood control aspect without giving regard to other aquatic resources such as fish, prawn and other aquatic organisms and their productivity, may cause degradation in Bangladesh part.

The Bangladesh Malaria Eradication Board Order, 1972 and the Prevention of Malaria (Special Provisions), 1978

These two Acts contain almost the identical provisions on the disease malaria. The government may by order prohibits from washing, white washing, plastering, painting or applying any other surface treatment with respect to any buildings or other premises sprayed with insecticide within a period of 5 months from such spraying. It is commonly known that for eradicating malaria disease, the insecticide like DDT is widely used. When DDT is sprayed in any premise, the adjacent water body of any such premise may be contaminated due to minfall and this cause severe destruction of the aquatic habitat. Even the insecticides are being sprayed into the water bodies to eradicate this disease, which is also actively accountable for the depletion of fish and aquatic organisms. The

Local Government laws such as City Corporation laws, Paurashava laws and union Parishad laws *etc.*, contain almost the same provisions for self-local government administration in Bangladesh. The local government bodies are responsible' for ensuring sarifation of its respective areas and may make measures for this purpose. The authorities shall adequate arrangements for the removal, collection and disposal from refuse Irom all public streets, latrines, urinals and all buildings and land which include land covered with water. The authorities will also construct, maintain, 'control environment pollution free. But it is not implemented properly and water pollution is occurred frequently. Water pollution is the major causes of degradation of aquatic resources and habitats of surrounding wetlands of urban area. As the laws have no provision regarding the manner of disposing the wastes, the aquatic eco-system is in a threatened position in urban area. Water quality is required for fisheries, which should be maintained, and the wetlands having significant fisheries areas are being destroyed. These laws do not speak of provisions for tackling this situation for the conservation of the fisheries resources in Bangladesh.

The Bangladesh Wildlife (Preservation) Order, 1973

The Government of Bangladesh to conserve and develop wild life in Bangladesh passes this Order. There are definitions of capture, dealer, game reserve, hunt, license, national park, officer, private game reserve, trophy, wild animal, wildlife sanctuary in this Order. "The Bangladesh Wildlife Conservation Advisory Board" is established under this Order for carryout the purposes of this Act. This law provides for the preservation, conservation and management of wildlife in Bangladesh. The earlier laws on wildlife preservation, namely, the Elephant preservation Act, 1879, the Wild Bird and Animals protection Act, 1912 and the Rhinoceros Preservation Act, 1932 have been repealed and their provision are suitably incorporated in this law. Some wild animals such as Crab, Indian Bull Frog, Green Frog, Cricket Frog, Leopard Cat, Jungle Cat *etc.*, prescribed in the First and Third schedule of this Order, shall not be hunted, killed or captured. The Government through notification in the official Gazette may declare the wildlife sanctuary and its areas. Under this Order, restriction imposes on entrance or inhabit of any person into wildlife sanctuary, cultivate, damage or destroy any vegetation, hunt, kill, or capture of any animal, introduce any exotic species of animal, cause any fire, pollute water flowing in or through a wildlife sanctuary *etc.*

The Government may also declare national park where the acts such as hunting, killing or capturing any wild animal, firing any gun or doing any other act, which may disturb any wild life, shall restrict. Filling, tapping, burning, clearing or breaking up any land for cultivation, polluting water flowing in and through the national park, construction of access roads *etc.*; shall not be allowed in a national park. In addition, no person shall hunt any wild animal by means of a set-gun; drop spear, deadfall gun trap, an explosive projectile bomb, grenade, electrical contrivances, a baited hook or any other trap *etc.*, and no person shall import into Bangladesh any live wild animal of an endemic or exotic species. This law is really a landmark for wildlife development and conservation in Bangladesh.

Bangladesh Fisheries Development Corporation Act, 1973

This Act was passed in 1973 for the establishment of Bangladesh Fisheries Development Corporation and later on it was amended in 1984. Under this Act," fish" means any species of fish or aquatic plants and animals including whale, seals, porpoises, dolphins, turtles, shellfish, oysters, crustaceans, frogs, ascidians and spawns and eggs of such animals or plants or plants grown either in salt water or fresh water. "Fishing boat" means a vessel of whatever size, and in whatever way propelled, which is for the time being employed in fishing. 'Fishing industry" means capturing, preservation, distribution and marketing of fish, and includes processing, manufacturing ring and disposal of fish and fish by- products; construction of fishing crafts, fishing nets and factories for fishing nets and gears and establishment and operation of refrigeration units, fish markets, fish ports and fish landing terminals and any matter incidental or ancillary thereto. Under this Act, there shall be a Corporation called "The Bangladesh Fisheries Development Corporation" for carrying out for the purposes of this Act.

Removal of Wrecks and Obstructions in Inland Navigable Water Ways Rules, 1973

This Rule was passed in 1973 to develop inland navigation. Inland navigable waterways includes all rivers, canals, any lake, haors, beels, shores, river ports, landing ghats and terminals maintained and operated by the authority on any of the above mentioned waterways, where vessels can play during any part of a year. 'Obstruction' means any impediment to the use of inland navigable waterways by any means and 'Vessel' means anything made for the conveyance by water of human being or of property and 'Wreck' means and includes the following when found in the inland navigable waterways or on the shore thereof. If any wreck or obstruction is found or reported in any inland navigable

waterways so as to impede or likely to impede navigation, the Authority may cause the wreck or obstruction to be raised, removed or destroyed. Similar Act named The Obstructions in Fairways Act 1881 was passed in British era for regulating and developing the waterways of inland navigation.

The Territorial Water and Maritime Zone Act, 1974

This Act was passed for providing the declaration of the territorial water and maritime zones. The territorial water and maritime zones are defined as the conservation zone, contiguous Zone, continental shelf, economic zone in this

Act. Under this Act, the government may specify the baseline with a view to the maintenance of sovereign, navigation, productivity of the living resources and other natural resources of the seas and may take measures to protect resources of the sea from indiscriminate exploitation, depletion or destruction. Besides, with a view to prevent and control marine pollution and preserving the quality and ecological balance in the marine environment in the high seas adjacent to the territorial waters may take such measures as it deems appropriate for this purpose. For the implementation of the territorial Water and Maritime Zone Act, the Government has formulated and passed the Territorial Water and Maritime Zones Rules in 1977 conducting procedural matters such as establishment of the sovereignty, regulation of foreign ships in the territorial waters, scientific research on marine resources, conservation of marine environment including pollution control and resource exploration of the zone, required construction and maintain within the economic zone installations, artificial island, regulation of the economic exploitation of marine resources by authorized persons. Under this Act, government may declare any territorial water as economic reserve zone for exploring and exploitation. Moreover, government may take necessary measures to conserve, develop, regulate any marine resources, foreign navigations and explore the resources for the development of the country.

The Bangladesh Petroleum Act, 1974

This Act was passed for the exploration, development, exploitation, production, processing, refining and marketing of petroleum. Under this Act, the government shall have, within the territory, continental shelf and economic Zone of Bangladesh, exclusive right to explore, develop, exploit, produce, process, refine and market petroleum. In this regard, the

Government may take steps such as to carry out geological and other surveys for the exploration of petroleum, to carryout drilling and other prospecting operations to prove and estimate the reserves of petroleum, to inspect the installation, well, plants, appliances and works operated or maintained by person engaged in petroleum operation *etc.*

The Jute Research Institute Act, 1974

This Act was passed in1974 and amended in 1983 and 1996. Under this Act, Jute Research Institute is established for carryout the some functions i.e. to promote agricultural, technological and economic research on Jute and allied fibers and their manufactures and dissemination of results thereof - to organize production, testing and supply of improved pedigree of jute seeds and multiplication procurement and their distribution to recognize organizations, selected growers and such other agencies as may be approved by the Board; to setup research centers, sub-stations, pilot projects and farms in different regions of the country for carrying out research on different problems of jute and allied fibers crops, jute products and allied materials; to establish project areas for demonstration of new varieties of jute developed by the Institute and to train the farmers for cultivation of those varieties of jute; to do and perform such other activities as may be necessary for the purposes of this Act.

The Bangladesh Petroleum Corporation Ordinance, 1976

This Ordinance was passed in order to provide for the establishment of the Bangladesh Petroleum Corporation. The functions of the corporation are to acquire lands *etc.*, import crude petroleum and other refined petroleum products, set up refineries and ancillary facilities, import lubricating oil, both in the from of base stock, necessary additives and other chemicals as well as finished products, manufacture blended lubricating products, *etc.* The Corporation may acquire lands *etc.*; for carrying out the purposes of the Ordinance, by purchasing, lease, exchange *etc.* The functions of this Ordinance shall be regulated subject to the provisions of the Petroleum Act, 1974.

The Chittagong Hill Tracts Development Board Ordinance, 1976

This Ordinance was passed in 1976 in order to provide for the establishment of a Development Board for the Chittagong Hill Tracts. Its functions are to prepare projects and schemes for the development of the Chittagong Hill Tracts and to execute approved

projects *etc.* In this Ordinance, any land required by the board for carrying out its functions and shall be deemed to be needed for a public purpose and such land may be requisitioned or acquired by the Government or the Deputy Commissioner as the case may be in accordance with any law for the time being in force in Bangladesh.

The Inland Shipping Ordinance, 1976

This Ordinance was passed in order to provide for survey, registration and control of navigation of vessels playing on inland waters. Dangerous goods, inland ship, inland water, mercantile purpose *etc.*, is defined in this Ordinance. 'Inland ship' means every description of vessel ordinarily playing on inland waters and propelled wholly or in part by steam, liquid fuel, electricity or any other mechanical powers and includes a sailing boat, dumb barge and other craft which is not so propelled but is towed or pushed by a vessel so propelled. Every inland ship other than inland ships owned by the Defense Services, which piles or seeks to play or is used or intended to be used for any service, on inland waters shall be required to be surveyed and registered under this Ordinance. Except for the purpose of proceeding to the assistance of any vessel, craft or person in distress, no inland ship shall proceed on any voyage or be used for any service when there is hoisted or announce a danger signal of storm or where there is reasonable apprehension of a storm and no inland ship shall proceed on any voyage or be used for any service for mercantile purpose. No person shall by setting any fishing net or by any other means, cause obstruction to navigation of any inland ship in any navigable water route.

The Chittagong and Mongla Port Authority Ordinance, 1976

This ordinance contains almost similar provisions and the provisions are jointly discussed. Both the Port Authorities have some good provisions for the conservation of ports from pollution and safe navigation, which also have some positive impacts on aquatic resources living in the adjacent water. The river should be clear, deepening and improving for which the fish and fish species can move freely and grow quickly. Although these Ordinances have provisions for loading and unloading of goods from vessels but due to the non-compliance of these provisions, the water is being polluted. Hence, the strict enforcement of law is must to maintain and conserve the ports as well as the fisheries resources.

The Bangladesh Agricultural Research Institute Ordinance, 1976

Under this ordinance the Bangladesh Agriculture Research Institute was established in order to conduct research on agriculture in Bangladesh. This institute shall perform some activities i.e. to undertake research for ensuring stable and productive agriculture through scientific management of land and water, evolution of new varieties agricultural products and development of appropriate technology and pest management methods; to provide the farmers with the information necessary for carrying out their farming business efficiently; to set up research centre, substation, project area and farms in different regions of the country for carrying out research on various problems of agriculture.

The Territorial Waters and Maritime Zones Rules, 1977

This Rules prohibits any explosive substances, spill oil from ships *etc.* that may damage the marine environment. But in practice, it is found that the water pollution from oil spills or any explosive or poison from other sources and chemical effluent of the adjoining industry is occurred frequently causing serious destruction of fish and other aquatic resources. Particularly, the juvenile fish of various species are depleting due to incurable diseases caused by such water pollution. Another reason of depletion is the unauthorized catching of fish by persons not having license that deprives licensee from getting the financial benefit for which they obtained license. The fine imposed in the Rules is very nominal comparing to damage done to water resources and various living resource dependant on water.

The Rural Electrification Board Ordinance, 1977

This Ordinance was passed providing for the establishment of the Rural Electrification Board. The functions of this Board is to take measures for the effective use of electricity to foster rural development with special emphasis on increase of use of electric power for economic pursuits, such as development of agriculture and establishment of rural industries and assisting the disadvantaged sections of the community for augmenting their income and standard of living.

The Seeds Ordinance, 1977

(ORDINANCE NO. XXXIII OF 1977).

An Ordinance to provide for regulating the quality of certain seeds for sale and for matters connected therewith.

Whereas it is expedient to provide for regulating the quality of certain seeds for sale for matters connected therewith;

NOW, THEREFORE, in pursuance of the Proclamations of the 20th August, 1975, and the 8th November, 1975, and in exercise of all powers enabling him in that behalf, the President is pleased to make and promulgate the following Ordinance :-

1. This Ordinance may be called the Seeds Ordinance, 1977.

a. 2. In this Ordinance unless there is anything repugnant in the subject or context,- "agriculture" means food and fibre crop production and includes horticulture; "Board" means the National Seed Board constituted under sub-section (1) of section 3;

b. "Certification Agency" means a Seed Certification Agency established under section8; "container" means a box, bottle, tin, barrel, case, receptacle, sack, bag, wrapper or other thing in which any article or thing is placed or packed;

c. "export" means taking out of Bangladesh to a place outside Bangladesh;

d. "import" means bringing into Bangladesh from a place outside Bangladesh; "kind" means one or more related species or sub-species or crop plants each individually or collectively known by one common name, such as, cabbage, paddy and wheat;

e. "notified kind or variety", in relation to any seed, means any kind or variety thereof notified under section 5;

f. "Non-notified kind or Variety" in relation to any Seed means any kind or variety not notified under section 5;]

g. "prescribed" means prescribed by rules made under this Ordinance;

h. "Seeds" means, except those used for drugs and narcotics, any of the following classes of seeds used for sowing or planting-

i. seeds of food crops including edible oil seeds and seeds of fruits and vegetables; seeds of fibre crops;

j. seeds of flower and ornamental plants;

k. seeds of forage crops;

l. and includes seedlings, and tubers, bulbs, rhizomes, root cuttings, all types of grafts and other vegetatively propagated materials;]

m. "Seed Analyst" means a Seed Analyst appointed under section 12;

n. "Seed Dealer" means a person or a company or an organization involved in production of seeds or carrying on the business of importing, selling, hoarding for sale, bartering or otherwise supplying any seed of any kind or variety for agricultural purpose: rovided that, farmer producing or hoarding seeds partly for his own use and partly for sale in the local hats and bazars by himself or through any other person, in small quantities shall not be treated as Seed Dealer.

o. "Seed Inspector" means a Seed Inspector appointed under section 13;

p. "Seed Laboratory" means the Government Seed Laboratory established or, as the case may be, declared under section 4; and

q. "variety" means a sub-division of a kind identifiable by growth, yields, plant, fruit, seed or other characteristics.

National Seed Board

(1) The Government shall, as soon as may be after the commencement of this Ordinance, constitute a Board to be called the National Seed Board to advise the Government on matters arising out of the administration of this Ordinance and to carry out the other functions assigned to it by or under this Ordinance.

(2) The Board shall consist of the following members, namely-

a. Secretary, Ministry of Agriculture, who shall also be the Chairman of the Board;

b. Vice Chancellor, Bangladesh Agricultural University (BAU), Mymensingh;

c. Executive Chairman, Bangladesh Agricultural Research Council (BARC), Dhaka;

d. Chairman, Bangladesh Agricultural Development Corporation (BADC), Dhaka;

e. Director General, Department of Agricultural Extension (DAE), Dhaka;

f. Director General, Bangladesh Rice Research Institute (BRRI), Gazipur;

g. Director General, Bangladesh Agricultural Research Institute (BARI), Dhaka;

h. Director General, Bangladesh Jute Research Institute (BJRI), Dhaka;

i. Director General, Bangladesh Institute of Nuclear Agriculture (BINA), Mymensingh;

j. Director General, Bangladesh Sugarcane Research Institute (BSRI), Pabna;

k. Executive Director, Cotton Development Board, Dhaka;

l. Member Director (Seed), Bangladesh Agriculture Development Corporation (BADC), Dhaka;

m. Director, Seed Certification Agency (SCA), Gazipur;

n. Director, Soil Resource Development Institute (SRDI);

o. Director, Plant Protection Wing, Department of Agricultural Extension (DAE);

p. a representative of the Ministry of Finance (Finance Division), not below the rank of Joint Secretary;

q. a representative of the Private Seed Dealers and Merchants Association;

r. a representative of the Private Seed Growers;

s. a representative from the farmer's community; and

t. Director General (Seed), Ministry of Agriculture, Dhaka-Member Secretary.

(3) Omitted by section 3 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005).

(4) The Government shall provide the Board with such clerical and other staff as it may consider necessary.

(5) The Government shall, by notification in the official Gazette, publish the [5][names and designations] of all the members of the Board and thereupon the Board shall be deemed to be constituted.

(6) [Omitted by section 3 of the Seeds (Amendment) Act, 1997 (Act No. XIII of 1997).]

(7) The Government may, at any time, terminate the appointment of a member of the Board without assigning any reason. The tenure of the members of the Board representing Private Seed Dealers and Merchants, Private Seed Growers, and Farmer's Community shall be for a period of three years.

(8) When a member of the Board dies, resigns or otherwise ceases to be a member, the vacancy shall be filled by fresh appointment.

(9) No person shall be, or shall continue to be, a member who-

(a) is or at any time has been convicted an offence which, in the opinion of the Government, is an offence involving moral turpitude; or

(b) is of unsound mind and stands so adjudged by a competent Court; or

(c) is or has at any time been adjudged insolvent; or

(d) absents himself from three consecutive meetings of the Board without leave of absence from the Chairman.

(10) The Board may appoint one or more committees consisting wholly of members of the Board or wholly of other persons or partly of members of the Board and partly of other persons, as it thinks fit, for the purpose of discharging such of its functions as may be delegated to such committee or committees by the Board.

(11) The Board may, subject to the previous approval of the Government, make by-laws for regulating its own procedure and the procedure of a committee appointed by it under sub-section (10) and the conduct of all business to be transacted by it or a committee.

(12) No act or proceeding of the Board shall be invalid merely on the ground of the existence of any vacancy in, or any defect in the constitution of, the Board.

Government Seed Laboratory

4. The Government may [establish Seed Laboratory] to be called the Government Seed Laboratory or declare, by notification in the official Gazette, any Seed Laboratory as the Government Seed Laboratory for the purposes of this Ordinance.

Power to specify kinds or varieties of seeds

5. (1) The Government shall regulate the quality of seed of any kind or variety to be sold and used for the purposes of agriculture. If the Government after consultation with the Board is of opinion that it is necessary or expedient to regulate sale, distribution, bartering or otherwise supplying, and import of seed of any kind or variety, it may, by notification in the Official Gazette, specify such kind or variety to be a notified kind or variety for the purposes of this Ordinance and different kinds or varieties may be notified for different areas.

(2) New varieties of non-notified crops developed by public or private agencies will be subject to approval and certification by the Board before being released.

(3) New varieties of notified crops developed by public agencies will be subject to approval by, and be registered with the Board before being released.

(4) Varieties of non-notified crops those are imported or locally developed by a private agency shall be registered with the Board giving prescribed cultivar description.

(5) In the event of a seed of any kind or variety is found to be harmful or potentially harmful to agriculture in any way, the Board may prohibit the sale, distribution, bartering, or otherwise supplying, import and use of that variety and may take any other action in the interest of agriculture.

(6) Any proposal for release of new varieties of notified crops shall be examined by a Technical Committee headed by the Executive Vice-Chairman. Bangladesh Agricultural Research Council (BARC), and consisting of representatives of National Agricultural Research System (NARS). Seed Certification Agency, Department of Agricultural Extension (DAE), Bangladesh Agricultural Development Corporation (BADC), private sector Seed Growers and Farmers Associations and make recommendation to the Board.

(7) Proposal for release of new varieties of non-notified crops developed by any public agency shall be subject to examination by the Technical Committee formed under sub-section (6).

Power to specify the standards of seed quality

6. After consultation with the Board, the Government may, by notification in the official Gazette, specify-

(a) the standard regarding the germination percentage, purity percentage, moisture content and such other components of seed quality with respect to any seed of any kind or variety.
(b) the mark or label to indicate that such seed conforms to the standard specified under clause (a) and the particulars which such mark or label may contain.

Regulation of sale of seeds of notified kinds or varieties

7. No Seed Dealer shall carry on the business of selling, keeping for sale, offering to sell, bartering or otherwise supplying any seed of any notified kind or variety, unless- (a) such kind or variety of seed is registered with the Board; (aa) for the purpose of this Ordinance every Seed Dealer shall be registered with the Board; b) such seed is identifiable as its kind or variety;

(c) such seed conforms to the standards of seed quality and the container of such seed bears, in the prescribed manner, the mark or label containing the correct particulars thereof specified under clauses (a) and (b) of section 6; (d) he complies with such other requirements as may be prescribed.

Labeling of Seeds

7A. Seed packaging in containers shall have a label containing batch identification, net weight or count, minimum germination percentage, physical purity, name and address of the company packaging the seed, and the date of packaging.

Seed Certification Agency

8. (1) The Government may, by notification in the Official Gazette, establish a Certification Agency to be called the Seed Certification Agency (SCA) to carry out the functions entrusted to it by or under this Ordinance.

(2) The functions of SCA shall among other things include: (a) to advise seed producers on production, processing and quality control of seeds; (b) to carry out post market quality control through inspection, testing; (c) to collect data or information on seed production, processing and quality control for use by the Board; (d) to certify all Breeder and Foundation seed of controlled crops; (e) to certify seeds for seed enterprises as a service, if resources permit; (f) to co-ordinate the variety evaluation and release mechanism for notified crops; (g) to advise NSB on the de-notification of varieties for reasons of poor performance or disease and pest susceptibility; (h) to help DAE in the promotion and use of improved seed of HYV's among farmers; (i) to collect samples of truthfully labeled seeds throughout the country and check their declared standards through appropriate tests; and (j) to enforce the provisions of the Seed Ordinance, 1977 and take appropriate legal measures against the offenders.

Grant of certificate by the Certification Agency

9. (1) Any person selling, keeping for sale, offering to sell, bartering or otherwise supplying any seed of any kind or variety] may, if he desires to have such seed certified by the Certification Agency, apply to the Certification Agency for grant of a certificate for the purpose.

(2) Every application under sub-section (1) shall be made in such form, shall contain such particulars and shall be accompanied by such fees as may be prescribed.

(3) On receipt of any such application for the grant of a certificate, the Certification Agency may, after such enquiry as it thinks fit and after satisfying itself that the seed to which the application relates conforms at least to the minimum limits of germination and purity specified for that seed under clause (a) of section 6, grant a certificate in such form and on such conditions as may be prescribed.

Revocation of certificate

10. If the Certification Agency is satisfied, either on a reference made to it in this behalf or otherwise, that-

(a) the certificate granted by it under section 9 has been obtained by misrepresentation as to any essential fact, or

(b) the holder of the certificate has, without reasonable cause, failed to comply with the conditions subject to which the certificate has been granted or has contravened any of the provisions of this Ordinance or the rules made thereunder, then, without prejudice to any other penalty to which the holder of the certificate may be liable under this Ordinance, the Certification Agency may, after giving the holder of the certificate an opportunity of showing cause, revoke the certificate.

11. (1) Any person aggrieved by a decision of the Certification Agency under section 9 or section 10 may, within thirty days from the date on which the decision is communicated to him and on payment of such fees as may be prescribed, prefer an appeal to such authority as may be specified by the Government in this behalf: Provided that the appellate authority may entertain an appeal after the expiry of the said period of thirty days if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time.

(2) On receipt of an appeal under sub-section (1), the appellate authority shall, after giving the appellant an opportunity of being heard, dispose of the appeal as expeditiously as possible.

(3) Every order of the appellate authority under this section shall be final.

Seed Analyst

12. The Government may, by notification in the official Gazette, appoint such persons as it thinks fit, having the prescribed qualifications, to be Seed Analyst and define the areas within which they shall exercise jurisdiction.

Seed Inspectors

13. (1) The Government may, by notification in the official Gazette, appoint such persons as it thinks fit, having the prescribed qualifications, to be Seed Inspectors and define the areas within which they shall exercise jurisdiction.

(2) Every Seed Inspector shall be deemed to be a public servant within the meaning of section 21 of the Penal Code (Act XLV of 1860) and shall be officially subordinate to such authority as the Government may specify in this behalf.

Powers of Seed Inspectors

14. (1) The Seed Inspector may-

(a) take samples of any seed of [18][any kind or variety] from- (i) any person selling such seed; or (ii) any person who is, in the course of conveying, delivering or preparing to deliver such seed to a purchaser or a consignee; or (iii) a purchaser or a consignee after delivery of such seed to him;

(b) send such sample for analysis to the Seed Analyst for the area within which such sample has been taken;

(c) exercise such other powers as may be necessary for carrying out the purposes of this Ordinance or any rule made thereunder.

(2) Where any sample of any seed of [19][any kind or variety] is taken under clause (a) of sub-section (1), its cost, calculated at the rate at which such seed is usually sold to the public, shall be paid on demand to the person from whom it is taken.

(3) The power conferred by this section includes power to break open any container in which any seed of [20][any kind or variety] may be contained or to break open the door of any premises where any such seed may be kept for sale:

Provided that the power to break open the door shall be exercised only after the owner or any other person in occupation of the premises, if he is present therein, refuses to open the door on being called open to do so.

(4) Where the Seed Inspector takes any [21][action] under clause (a) of sub-section (1), he shall, as far as possible, call not less than two persons to be present at the time when such action is taken and take their signatures on a memorandum to be prepared in the prescribed form and manner.

(5) The provisions of the Code of Criminal Procedure, 1898 (Act V of 1898) shall, so far as may be, apply to any search or seizure made this section as they apply to any search or seizure made under the authority of a warrant issued under section 98 of the said Code.

Procedure to be followed by Seed Inspectors

15. (1) Whenever a Seed Inspector intends to take sample of any seed of [22][any kind or variety] for analysis, he shall-

(a) give notice in writing, then and there, of such intention to the person from whom he intends to take sample;

(b) except in special cases provided by rules made under this Ordinance, take three-representative samples in the prescribed manner and mark and seal or fasten up each sample in such manner as its nature permits.

(2) When samples of any seed of [23][any kind or variety] are taken under sub-section (1), the Seed Inspector shall-

(a) deliver one sample to the person from whom it has been taken;

(b) send in the prescribed manner another sample for analysis to the Seed Analyst for the area within which such sample has been taken; and

(c) retain the remaining sample in the prescribed manner for production in case any legal proceedings are taken or for analysis by the Seed Laboratory under sub-section (2) of section 16, as the case may be.

(3) If the person from whom the samples have been taken refuses to accept one of the samples, the Seed Inspector shall send intimation to the Seed Analyst of such refusal and thereupon the Seed Analyst receiving the sample for analysis shall divide it into two parts and shall seal or fasten up one of those parts and shall cause it, either upon receipt of the sample or when he delivers his report, to be delivered to the Seed Inspector who shall retain it for production in case legal proceedings are taken.

(4) Where a Seed Inspector takes any action under clause (c) of sub-section (1) of section 14-

(a) he shall use all despatch in ascertaining whether or not the seed contravenes any of the provisions of section 7 and if it is ascertained that the seed does not so contravene, forthwith revoke the order passed under the said clause or, as the case may be, take such action as may be necessary for the return of the stock of the seed seized;

(b) if he seized the stock of the seed, he shall, as soon as may be, inform a Magistrate and take his orders as to the custody thereof;

(c) without prejudice to the institution of any prosecution, if the alleged offence is such that the defect may be removed by the possessor of the seed, he shall, on being satisfied that the defect has been so removed, forthwith revoke the order passed, any record, register, document or any other material object under clause (d) of sub-section (1) of section 14, he shall, as soon as may be, inform a Magistrate and take his orders as to the custody thereof.

Report of Seed Analyst

16. (1) The Seed Analyst shall, as soon as may be, after the receipt of the sample under sub-section (2) of section 15, analyse the sample at the Seed Laboratory and deliver, in such form as may be prescribed, one copy of the report of result of the analysis to the Seed Inspector and another copy thereof to the person from whom the sample has been taken.

(2) After the institution of a prosecution under this Ordinance, the accused may, on payment of the prescribed fee, make an application to the Court for sending any of the samples mentioned in clause (a) or clause (c) of sub-section (2) of section 15 to the Seed Laboratory for its report and on receipt of the application, the Court shall first ascertain that the mark and the seal or fastening as provided in clause (b) of sub-section (1) of section 15

are intact and may then despatch the sample under its own seal to the Seed Laboratory which shall thereupon send its report to the Court in the prescribed form within one month from the date of receipt of the sample, specifying the result of the analysis.

(3) The report sent by the Seed Laboratory under sub-section (2), shall supersede the report given by the Seed Analyst under sub-section (1).

(4) Where the report sent by the Seed Laboratory is produced in any proceedings, it shall not be necessary to produce in such proceedings any sample or part thereof taken for analysis.

Import and Export of Seeds

[24][17. (1) No person shall export or import or cause to be exported or imported any seed of any kind or variety unless it conforms to the standards of seeds quality, and the container of such seeds bears, in the prescribed manner, the mark or label containing the correct particulars thereof specified for that seed under section 6.

(2) Seeds of approved varieties of all notified crops may be imported for commercial sale. Registered seed growers may be permitted to import small quantities of such varieties not approved by NSB for the purpose of research and adaptability testing.

(3) There shall be no restriction on import of seeds of non-notified crops, except for ensuring prescribed quality.

(4) All imported seeds shall be subject to the provisions of the Destructive Inspects and Pests Act, 1914 (Act No. II of 1914).]

Recognition of seed certification agencies of foreign countries

18. On the recommendation of the Board, the Government may, by notification in the official Gazette, recognise any seed certification agency established in any foreign country [25][for the purposes] of this Ordinance.

Cognizance of Offences

[26][19. Notwithstanding anything contained in the Code of Criminal Procedure, 1898 (Act No. V of 1898), no court shall take cognizance of any offence punishable under this Ordinance except upon a complaint in writing, made by a Seed Inspector.]

Place and Procedure of trial

[27][19A. Notwithstanding anything contained in the Code of Criminal Procedure, 1898 (Act No. V of 1898) an offence punishable under this Ordinance may be tried at any place within the local jurisdiction of the metropolitan magistrate or of the magistrate of the first class.

Penalty

19B. If any person contravenes any provision of this Ordinance or any rule made there under, or prevents a Seed Inspector from taking sample under this Ordinance or prevents him from exercising any other power conferred upon him by or under this Ordinance, he shall, on conviction, be punishable-

(a) for the first offence, with imprisonment for a term no exceeding thirty days or with fine which may extend to taka five thousand, and

(b) in the event such person having been previously convicted of any offence under this section, with imprisonment for a term not exceeding ninety days or with fine which may extend to taka twenty thousand.

Special Provision regarding fines

19C. Notwithstanding anything contained in Section 32 of the Code of Criminal Procedure, 1898 (Act No. V of 1898), it shall be lawful for any metropolitan magistrate or magistrate of the first class to pass a sentence of fine under this Ordinance exceeding ten thousand taka.]

Forfeiture of property

20. When any person has been convicted under this Ordinance for the contravention of any of the provisions of this Ordinance or the rules made thereunder, the seed in respect of which the contravention has been committed may, if the Court so orders, be forfeited to the Government.

Offence by companies

21. (1) Where an offence under this Ordinance has been committed by a company, every person who at the time the offence was committed was in charge of, and was responsible to, the company for the conduct of the business of the company as well as the company

shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly:

Provided that nothing contained in this sub-section shall render any such person liable to any punishment under this Ordinance if he proves that the offence was committed without his knowledge or that he exercised all due diligence to prevent the commission of such offence.

(2) Notwithstanding anything contained in sub-section (1), where an offence under this Ordinance has been committed by a company and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of, any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

Explanation.-For the purposes of this section,-

(a) "company" means any body corporate and includes a firm or other association of individuals; and

(b) "director", in relation to a firm, means partner in the firm.

Protection of action taken in good faith

22. No suit, prosecution or other legal proceeding shall lie against the Government or any officer of the Government for anything which is in good faith done or intended to be done under this Ordinance.

Power to make rules

23. (1) The Government may, by notification in the official Gazette, make rules to carry out the purposes of this Ordinance.

(2) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for-

(a) the functions of the Board and the travelling and daily allowances payable to members of the Board and of the committee;

(b) the functions of the Seed Laboratory;

(c) the functions of the Certification Agency;

(d) the manner of marking or labelling the container of seed of any notified kind or variety;

(e) the requirements which may be complied with by a person carrying on the business referred to in section 7;

(f) the form of application for the grant of a certificate under section 9, the particulars it may contain, the fees which shall accompany it, the form of the certificate and the conditions subject to which the certificate may be granted;

(g) the form and manner in which and the fee on payment of which an appeal may be preferred under section 11 and the procedure to be followed by the appellate authority in disposing of the appeal;

(h) the qualifications and duties of Seed Analysts and Seed Inspectors;

(i) the manner in which samples may be taken by the Seed Inspectors, the procedure for sending such samples to the Seed Analysts or the Seed Laboratory and the manner of analysing such samples;

(j) the form of report of the result of the analysis, and the fees payable in respect of such report;

(k) the records to be maintained by a person carrying on the business referred to in section 7 and the particulars which such records shall contain; and (l) any other matter which is to be or may be prescribed.

Clause (hh) was inserted by section 2 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

Clause (j) was substituted by section 2 of the Seeds (Amendment) Act, 1997 (Act No. XIII of 1997)

Clause (kk) was substituted by section 2 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

Sub-section (2) was substituted by section 3 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

The words "names and designations" were substituted for the words "names or designations" by section 3 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005

Sub-section (7) was substituted by section 3 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

The words "and any person so appointed shall hold office for the unexpired term of his predecessor" were omitted by section 3 of the Seeds (Amendment) Act, 1997 (Act No. XIII of 1997)

The words "establish Seed Laboratory" were substituted for the words "establish a Seed Laboratory" by section 4 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005) Section 5 was substituted by section 5 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

Section 6 was substituted by section 4 of the Seeds (Amendment) Act, 1997 (Act No. XIII of 1997)

The words "any kind or variety" were substituted for the words "any notified kind or variety" by section 6 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005) Section 7 was substituted by section 5 of the Seeds (Amendment) Act, 1997 (Act No. XIII of 1997)

Clause (a) was substituted by section 7 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

Clause (aa) was inserted by section 7 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

Section 7A was inserted by section 8 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

Section 8 was substituted by section 9 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

The words “any kind or variety” were substituted for the words “any notified kind or variety” by section 10 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

The words “any kind or variety” were substituted for the words “any notified kind or variety” by section 11 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

The words “any kind or variety” were substituted for the words “any notified kind or variety” by section 11 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

The words “any kind or variety” were substituted for the words “any notified kind or variety” by section 11 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

The word “action” was substituted for the word “section” by section 6 of the Seeds (Amendment) Act, 1997 (Act No. XIII of 1997)

The words “any kind or variety” were substituted for the words “any notified kind or variety” by section 12 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

The words “any kind or variety” were substituted for the words “any notified kind or variety” by section 12 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

Section 17 was substituted by section 13 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

The words “for the purposes” were substituted for the words “of the purposes” by section 14 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

Section 19 was substituted by section 15 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

Sections 19A, 19B and 19C were inserted by section 16 of the Seeds (Amendment) Act, 2005 (Act No. XXVI of 2005)

International Centre for Diarrheas Disease Research Bangladesh Ordinance, 1978

This Ordinance was passed in order to provide for the establishment of an international research centre called the 'International Centre for Diarrheas Disease Research, Bangladesh' for carrying out the purposes of this Ordinance. The aims and objectives of the Centre is to function as an institution to undertake and promote study, research and dissemination of knowledge in diarrhea diseases and it is directly related to the subjects of nutrition and fertility with a view to developing improved methods of health care and for the prevention and control of diarrhea diseases and improvement of public health programs with special relevance to developing countries. The Centre shall have the responsibilities such as to control clinical research, laboratory and animal experiments, epidemiological and survey research, field investigation, demonstration projects, public health *etc.*

The Prevention of Malaria (Special Provision) Ordinance, 1978

This Ordinance was passed in order to take measures for the prevention of malaria and for matters connected therewith. For the purposes of prevention of malaria, the Government or any person authorized by it in this behalf may formulate schemes, and adopt co-coordinated measures for prevention of malaria, lay down the policies in accordance with which the Directorate of Health Services shall execute any such schemes or measures. The Government or any person authorized or empowered has the power to order any person to undergo medical examination as required for the prevention of malaria. And treatment to prohibit from washing, whitewashing, plastering, painting or applying any other surface treatment with respect to any building or other premises sprayed with insecticide during a period of five months from such spraying and prohibit doing of anything with respect to any engineering, agricultural and industrial projects, which may increase the extent and spread malaria.

The Attia Forest Protection Ordinance, 1982

This Ordinance was passed in order to make provisions for the protection of the Attia Forest in the districts of Dhaka and Tangail. Under this Ordinance, the constitution of the reserved forest is mentioned. It signifies that notwithstanding anything contained to the

contrary in the Forest Act, 1927 or in any other law for the time being in force or in any judgment, decree or order, the lands comprising of 59648.70 acres constituting a reserved forest known as the Attia Forest. All suits, appeals, petitions applications and other legal proceedings pending immediately before the commencement of this Ordinance in Court like civil, criminal or revenue Court and including the High Court and the Appellate Division are disposed of those cases.

The Bangladesh Veterinary Practitioners Ordinance, 1982

This Ordinance was passed in order to make provisions for the regulation, control and registration of veterinary practitioners in Bangladesh. Under this Ordinance, a Veterinary Council named Bangladesh Veterinary Council has formed and for matters connected therewith. For veterinary practices, the Veterinary practitioner has to register under Council as veterinary practitioner. Without fulfilling the requirements of this Ordinance, no veterinary practitioner will be competent to hold any veterinary appointment in a veterinary institution, hospital, dispensary or abattoir maintained or aided by the Government or any local authority. In this Ordinance, no person shall be entitled other than registered practitioner to recover any fee or charge any fee for any veterinary advice or attendance or for the performance of any operation or for any medicine supplied unless he shall prove upon the trial that he is a duly registered veterinary practitioner. Only the veterinary practitioner shall practice or hold himself out as practicing the veterinary medicine or surgery.

The Acquisition and Requisition of Immovable Property Ordinance, 1982

This Ordinance deals with the property and compensation awarded by the authority for public purposes. But in fact, during the acquisition of land, the Government is not consider the environmental aspects such as bio-diversities, ecosystems *etc.*, of those particular areas. Environmental consequences such as fish and fish species degradation did not considered under the Act.

The National Archives Ordinance, 1983

Under this Ordinance, the 'National Archives' was established in order to provide for the collection, preservation, maintenance and administration of permanent records and achieves of the Government. An advisory Council for the National Achieves called the 'National Achieves Advisory Council' shall be established under -this Ordinance. This

Advisory Council will make advice to the Government on all matters relating to the-location, preservation and use of public achieves, custody and transfer of public records, inspection and preservation of documents and manuscripts of historical or cultural or literary value in private possession, inspection by members of the public achieves. In addition, editing and publishing of public achieves and private manuscripts *etc.* The Government will appoint a Director who will take all necessary measures for the conservation of public achieves such as the restoration and conservation of public archives in a suitable manner and make photographic reproductions or duplicate copies of any public achieves where necessary *etc.*

The Bangladesh Jatiya Jadughar Ordinance, 1983

Under this Ordinance, a 'National Museum' called the 'Bangladesh Jatiya Jadughar' was established. It is a body corporate, having perpetual succession and a common seal, with power to acquire, hold and dispose of property, both movable and immovable, and shall file cases by the said name and to be sued. It shall be a Board for administering and develop the Jadughar. The functions of the Board is to regulate the Jadughar, to collect, preserve and display the antiquities works of arts, ethnological specimens, relics of the liberation struggle of Bangladesh, specimens of flora and fauna, traditional crafts and artifacts, products of intellectual activities, audio-visual documentary evidence and such other objects and items related to the cultural and natural heritage of Bangladesh. Also, to collect, preserve and display material evidence of different aspects of various world civilizations, to arrange facilities for research on the collections of the Jaduqhar and to publish and sell periodicals, books, anthologies and reproductions of objects *etc.*

Fish and Fish Product (Inspection and Quality Control) Ordinance, 1983

This Ordinance was passed in order to provide for inspection and quality control of fish and fish products in Bangladesh. The 'Container, Fish, Fish Products, Fresh Fish, Fish Processing and Fish Packing Plant and Establishment. 'Inspection, 'Processing' and 'Quality Control' is defined in this Ordinance. The 'Container' means any type of receptacle, package, wrapper of confining bank used in packing or marketing of fish and fish products. 'Fish' includes all cartilaginous and bony fishes, prawn, shrimp, amphibians, tortoise, turtles, crustacean animals, coelenterates mollusks, echinoderms and frogs at all stages of their life history. 'Fish products' includes any products or by-products of fresh fish. 'Fish processing and Fish Packing Plant and Establishment' means any place

where fish or fish products is processed for export or stored for export or for internal marketing. 'Inspection' means physical examination of fish processing and packing plants with regard to hygiene and sanitation and, physical, chemical and bacteriological examination of fish and fish products. 'Processing' includes clearing, filleting, icing, packing, canning, freezing, smoking, salting, cooking, pickling, drying or preparing fish in any other manner for marketing. 'Quality control 'means the technique by which conformity of a product to establish standard is assured.

The Bangladesh Irrigation Water Rate Ordinance, 1983

This Ordinance was passed in order to consolidate and amend the law relating to the imposition of a water rate for supply, regulation or storage of water for irrigation or drainage. In this Ordinance "Board" means the Bangladesh Water Development Board constituted by the Bangladesh water- and power Development Board Order, 1972. "Canal" means any canal, channel, including field channel, plot channel and intake channel, river, stream, water course, reservoir, pump and tube wells constructed, installed, maintained or controlled by the Government or by the Board or by the Corporation for supply, regulation or storage of water for the purpose of irrigation or drainage, and includes any work, embankment, structure, supply or escape channel connected with any canal, channel or reservoir, and any land on the banks of any canal a defined in this clause. "Corporation" means the Bangladesh Agricultural Development Corporation established under the Bangladesh Agricultural Corporation Ordinance, 1961 (E.P. Ordinance XXXVII of 1961). Under section 4 of subsection (1), whenever the Government is of opinion that lands within any area be benefited or are likely to be benefited by water supplied or regulated by the Government or by the Board or by the Corporation through any canal during any financial year, the Government may, by notification, declare its intention to impose in such area, hereinafter referred to as the notified area, a water rate for such financial year. It is provided that the water rate so specified for a crop season shall not exceed such rate as may be prescribed.

The Marine Fisheries Ordinance, 1983

This Ordinance was passed in 1983 in order to make provisions for the management, conservation, and development of marine fisheries in the Bangladesh fisheries waters and to deal with certain matters connected therewith. Some definitions are underlined in this law such as,–"Bangladesh Fisheries Waters" means the territorial waters and economic

zone of Bangladesh as declared by the Government under the Territorial Waters and Maritime Zones Act, 1974 (XXVI of 1974), and any other marine waters over which has, or claims to have, jurisdiction under law with respect to the management, conservation and development of the marine living resources. "Fish" means any aquatic animal, whether piscine or not, and includes any shellfish, crustacean, turtle or aquatic mammal, and the young, fry, eggs and spawn thereof. "Fishery" means one or more stocks of fish that can be treated as a unit for the purposes of conservation and management. "Fishing" means catching, taking or killing fish by any method, and includes attempting to catch, take or kill fish by any method "Fishing vessel" means any vessel used for fishing or for processing carriage storage of fish, and includes any vessel used in support of or ancillary to, fishing operations but doesn't include any vessel carrying fish as part of a general cargo unless that vessel is engaged in operation in support of, or ancillary to, fishing operations." Foreign fishing vessel" means any fishing vessel other than a local fishing vessel. 'Local fishing vessel' means any fishing vessel-(I) wholly owned by one or more persons who are citizens of Bangladesh; or (ii) wholly owned by any company, society or other association of persons established under the law of Bangladesh of which at least 51 percent of the shares are held by citizens --' Bangladesh and includes any fishing vessel registered in Bangladesh and operating under Bangladesh flag under joint venture or any other approved arrangements. (iii) Wholly owned by the Government or by a statutory corporation established under a law of Bangladesh. "Skipper", in relation to fishing vessel, means the person for the time being having command or charge of the vessel.

The Livestock Research Institute Ordinance, 1984

Under this Ordinance, 'the Livestock Research Institute' was established for carrying out the purposes of this Ordinance. The objectives and functions of the institute is to: identify and solve the basic livestock problems of the country through research, develop suitable method for quick diagnosis and treatment of various livestock diseases, study epidemiology on the existing situation of various bacterial, viral, fungal and parasitic diseases and find their pathogenic effects on the productivity of animals. Further, the institute will take steps to develop suitable breed of livestock, poultry and develop appropriate technology for production of suitable biologics for improving the management practices, which will ensure better health and production of animals and birds. Identifying poisonous plants and their effects on animal health and their remedy, improve livestock production technology *etc.*

The Fisheries Research Institute Ordinance, 1984

This fisheries research institute Ordinance is passed in 1984 to provide for the establishment of Fisheries Research Institute. This Ordinance may be called the Fisheries Research Institute Ordinance, 1984. In this Ordinance, unless there is anything repugnant in the subject or context- "Board" means the Board of Governors of the Institute, "Chairman" means the Chairman of the Board, Institute means the Fisheries Research institute established under section, "Member" means a member of the Board and "Prescribed" means prescribed by rules or regulations made under this Ordinance.

The Land Reforms Ordinance, 1984

It is an Ordinance relating to the reform of land law, land tenure, land holding and transfer with a view to maximizing production and ensuring a better relationship between landowners and bargadars. This Ordinance has reformed the existing laws and has established the relationship through those modifications and obligations. This Ordinance ascertains the boundaries of responsibilities and duties between the landowner and the bargadars. If they violate these rules it will be violation of law. As this law is passed aiming at the serving of the sustainable use of land for the betterment of the nations. So, it is a milestone for achieving the sustained of land use in the country. The salient features - the landowner has to provide land to the bargadars through a contract. This contract has some ingredients such as terms and conditions of the contract, termination, crops sharing *etc.*, for both the parties.

The Bangladesh Oil, Gas and Mineral Corporation Ordinance, 1985

Under this Ordinance, a corporation named the 'Bangladesh Oil, Gas and Mineral Corporation', which may also be called the 'Petrobangla', was established for carrying the purposes of this Ordinance. In this Act, 'Mineral' means all minerals whether in a solid, liquid or gaseous state and rock resources, metal or non-metal including coal, limestone, clay, sand, metalliferous ore and non-metallic mineral and any other naturally occurring substance which may be used either in its original form or after processing for economic purposes. It clarifies that rules and regulations, the general direction and administration of the affairs and business of the affairs and business of the corporation shall vest in a Board of Directors, which may exercise all powers and do all acts and things, which may be

exercised or done by the Corporation. The functions of the Corporation are to undertake research and development programs on the field of oil, gas and minerals and prepare and implement of such programs for the exploration and development of oil, gas and mineral resources *etc.* The corporation shall have the power to undertake research for alternative use of natural gas, carry out geological, geophysical and other surveys for further exploration and development of oil, gas and mineral resources, plans, promote and develop of cement industries in the country. In the Ordinance, the government reserves the rights of the utilization and preservation of natural resources such as gas and other minerals for sustainable development of the country.

The Protection and Conservation of Fish Rules, 1985

This fish Rules is passed in 1985 for the execution of the Protection and Conservation of Fish Act, 1950. Under section 3 of this Act, the Government has enacted the some rules i.e. no person shall conduct fishing except the following restrictions; every year from July to December, no person shall catch fish not exceeding the limit of the size of 23 centimeters (9") of fish like katla, rui, mrigel, kalbaus *etc.*; every year from November to April, no person shall catch fish not exceeding the limit of the size of 23 centimeters (9") of hilsha which is known as "Jatka"; every year from February to June no person shall catch fish not exceeding the limit of the size of 30 centimeters of fish such as silan, Boal. This type of fishing and transportation are prohibited; every year from November to April, no person shall catch fish not exceeding the limit of the size of 23 centimeters (9") of Pangas; license should be collected through the proper authority (At present District Fisheries Officers) in exchange of specified fees for pisciculture and if it is not possible, it shall not be taken any step for processing, fishing of any size of rui, katla, mrigel, kalbaus *etc.* from the statutory 27 rivers, khal *etc.*; every year from April to August, Shol, Ghazar, swarm breeding of Taki fish, conjugal fish shall not be taken any step for fishing or destruction from the marshes, which have connection with the normal river, water bodies, khal, beel *etc.*; temporary or permanent bridge or any infrastructure shall not be built for irrigation or flood control or drainage; fishing shall not be conducted through the permanent fixed engines in the river, water bodies, canal, beel. If it is not followed its regulations then the fixed engines shall be removed, seized, and forfeited; fishing cannot

be possible using explosive substances. No step shall be taken for fish destruction; no use of pesticides in inland water bodies for fishing; environmental pollution, commercial wastage, or in other causes shall not be taken in consideration for fish destruction; the current net meaning that the gill net, 4.5 centimeters of length or breadth or less than of it are prohibited; fishing and swarm in the adjacent areas of the seas are prohibited.

The Ground Water Management Ordinance, 1985

This Ordinance was passed in order to manage the ground water resources for agricultural production. Under this Ordinance, aquifer, deep tube well, deep-set hand pumped tube well and shallow tube well is defined. In this Act, "Aquifer" means a body of saturated soil at any depth below ground level that can store and transmit sufficient quantity of water to the wells. "Deep tube well" means a tube well called as such operated by a submersible pump set or turbine pump coupled with a prime mover capable of pumping ground water when the pumped water level depth is more than 7 meters. "Deep set hand pumped tube well" means a hand pumped well used for either irrigation or water supply where the pump valve is set below the surface and operated remotely by a pump rod operated from the surface and is capable of pumping ground water when the pumped water level depth is more than 8 meters. "Static water level" means the depth from the ground level to the saturated water level beneath the ground surface where no pumping has taken place. "Suction lift hand pumped tube well" means hand pumped well used for either irrigation or potable water supply when the pump valve are situated above ground level but is only capable of operation when the vertical distance between the pump valve and pumped water level depth is within 8 meters. "Tube well" means a deep tube well shallow tube well, suction lift hand pumped well or deep set hand pumped well used for irrigation or water supply.

Rangamati Hill District Local Government Parishad Act, 1989

Under this Act, 'the Rangamati Parbattya District Local Government Parishad' was established for carrying out the purposes of this Ordinance. The meaning of the tribal people in hill tracts is defined by this Ordinance. The Parishad shall perform all activities on the basis of its executive powers and can take every measure in this regard. The Parishad will formulate programs and can implement it in accordance with its

jurisdiction. Illegal entry or occupation by any person in any public roads and public used places prohibits in this ordinance. The Parahad will deal with the functions such as to coordinate the development activities of the local authorities of the districts, to implement projects taken by the local authorities, review and auditing its accounts, helping, cooperating and encouraging them for implementation. The Parishad will establish hospital, primary Medicare center and dispensary *etc.* constitute mobile team of doctors? training to the nurses, prevent and control malaria and infectious diseases, adopt family planning programs and implementation, setup public health center; formulate public health policy *etc.*, develop the public health and its policy formulation and implementation, and introduction of the public health education. The Parishad will develop agriculture, establish and maintain agriculture farm, introduce modern technology and equipment for agriculture and lend this to the farmer, develop and conserve the forests and. forest resources that does not maintain by the government, take initiatives to cultivate fallow land, conserve forestland in rural areas. It will develop irrigation systems without interruption of the Kaptai hydropower plant, introduce and develop agricultural education, maintain, conserve and rescue occupied land and develop drainage for wetland, sow and maintain different tree plants on the public roads and other common places for afforestation.

The Parishad will initiate different programs for the development and promotion of animal husbandry such as establishment of animal hospital and ins maintenance, store up animal foods, conservation of domestic animals, development and maintenance of grazing land, prevention, elimination and controlling of animal diseases. It will work for establishment and maintenance of dairy farm, establishment of milk village and healthy house for animals, poultry farm, and last of all will initiates the development and maintenance the domestic animals and poultry in the hill tracts.

In addition, it will work for fisheries and fishery farming development, industry and trade development, education and educational institute development, social welfare and cultural development, archeological conservation, initiates for establishing the information center for various purposes *etc.* Another important task will be done by this local authority is to keep law and order, operate administration and dispose of the offences.

It is noted that the Government has established two more local government Parishad Acts such as the Khagra Chari Parbattya District Local Government Parishad and the Bandarban Parbattya district local Government Parishad with the same objectives and functions of the Rangamati Parbattya District Local Government Parishad.

Brick Burning (Control) Act, 1989

ACT NO.8 OF 1989

This Act was passed in 1989 and amended it in 1992 and in 2001 for the safeguard of the forest product and for the purposes of controlling the brick burning. Under this Act, no license should be given for constructing brickfield within three kilometers from the Upazilla headquarter, the protected and vested and acquired or acquisitioned forestland of the government, City Corporation, Municipality, residential areas, fruits garden. It is stated that no person shall use fuel wood for brick burning.

An Act made to control the burning of bricks.

Whereas it is expedient to make provision for the control of the burning of bricks;

Therefore it is enacted as follows:-

1. Short title and commencement

(1) This Act may be called the Burning of Bricks (Control) Act, 1989.

(2) This Act shall come into force on the 17th Asharh, 1396/1st July, 1989, accordingly.

2. Definitions.- Unless there is anything repugnant in the subject or context, in this Act-

a. "Firewood" means wood usable as firewood;

b. "Rule" means a rule made under this Act;

c. "Person" means any company, committee or group of persons, whether statutory or not;

d. "Licence" means a licence given under this Act.

3. Supremacy of the Act.- This Act shall have effect, notwithstanding anything contained in any other laws for the time being in force.

4. Licence for burning bricks.

a. No person may burn bricks without a licence given under this Act.

b. An application must be put forward to the chairman of the Upazila Parishad of the District in which bricks are to be burnt, for a licence as mentioned in subsection (1), in a form determined by rule, and by paying a fee.

c. Being satisfied with the accuracy of the matters mentioned in the application, the chairman of the Upazila Parishad shall grant the licence in a form specified by rule.

d. The licence for burning bricks shall be valid for five years from the date of its issue; but if within the said period any person holding a licence violates any provision of this Act, or any rule under the said provision, or any of the conditions contained in the licence, the chairman of the Upazila Parishad may cancel the licence:-

Provided that the licence may not be cancelled without giving the person holding the licence the opportunity of showing reasons against the proposed cancellation of the licence.

5. Prohibition of burning bricks with firewood.- No person may use firewood for burning bricks.

6. Inspection.- The chairman of the Upazila Parishad or any person entitled to do so by the Government or the chairman may without any order inspect any brick factory in order to inquire if any sections of this Act have been violated or not.

7. Punishment.- Any person violating any provision of this Act, or any rule under such provision, or any conditions mentioned in the licence, shall be punishable with sentence to imprisonment up to six months, or with a fine up to 10000 Taka, or with both punishments.

8. Filing suits.- No suit shall be filed in any court against offences under this Act without the written accusation of the chairman of the Upazila Parishad or a person put into charga by him for this purpose.

9. Power to make rules.- The Government may by notification in the official Gazette make rules for the purpose of this Act.

Water Resources Planning Act, 1992

The water resources development and its utilization is ensured through this Act. 'The Water Resources Planning Institute' was established through the Gazette notifications. The general conducts and administration of the organization will be vested to the Board of Governors of the Institute and the powers and functions of this Board will the same as the Institute has. Under the provision, the institute shall carry out the activities such as to formulate environmentally balanced water resource Master Plan for water resources development, to formulate national strategies and policies for scientific use and conservation of water resources.

The Institute will give advice to other concern institutions engaged in water resources development, utilizations and preservation, to give assistance to any other organizations engaged in the development, utilization and conservation of water resources for conducting survey and in this respect, special survey will be conducted on any matter of water resource development, if necessary. Moreover, the Institute will take initiatives to collect and review the information related to the utilization of water resources and adopt measures for publicity, to arrange and hold the National, and prior approval of the Government, International seminars, conference and workshop on water resource development and utilization.

The Chingri Chas Avikar Ain (Shrimp Culture Extra Tax Act), 1992

The Chingri Chas Avikar (Shrimp Culture Extra Tax Act) Ain was passed in 1992 and the objective of this Act is to impose extra tax in the areas of Chingri Chas benefitted land. In this law, the Avikar (extra tax), Owner of the Land, and Water Development Board means the 'Water Development Board Bangladesh' constituted under the Water Development Board Order, 1992 (President Order No. 59 of 1972) is defined. The provision S 52 of this law are discussed here.

The Chingri Chas Avikar Rules (The Shrimp Culture Extra Tax Rules), 1993

The Chingri Chas Avikar Rules (Shrimp Culture Extra Tax Rules) was passed in 1993 for the implementation of the Chingri Chas Avikar Ain (Shrimp Culture Extra Tax Act), 1992.

The Coast Guard Act, 1994

The Coast Guard Act establishes for formation and development of the coast guard force in Bangladesh. There shall be a "Coast Guard Department" and a "Coast Guard Force" for carrying out the purposes of this Act. The functions of this coast guard force are to protect the national interest of territorial waters and Maritime Zones of Bangladesh to prevent illegal fishing in maritime zones, to prevent illegal entrance in and illegal going out through the territorial waters and maritime zones of Bangladesh. The Coast Guard will enforce any order by the Court or warrant by any other authority or any other order by concern authority on the matters of any ship comes in territorial waters of Bangladesh or any person staying in that ship. It will investigate the environmental pollution activities in the territorial waters of Bangladesh and to take preventing measures for it, ensure the security of persons working in the territorial waters of Bangladesh, prevent drugs smuggling and smugglings. Coast Guard will participate in relief and rescue activities during natural disaster and rescue ship and men and goods in ship from accident-affected ship, take necessary arrangement for publicity the disaster warning messages with other information through the radio or any other media during the natural disaster. It will help the naval force during the war, petrol in the territorial waters of Bangladesh, assist concern authorities to ensure security of the sea ports, restrain and control destructive and terrorist activities occurs in the territory of waters of Bangladesh and cooperate other authorities regarding this matters, and carryout other work ordered by the Government.

The Bangladesh Environment Conservation Act, 1995

An Act to provide for conservation of the environment, improvement of environmental standards and control and mitigation of environmental pollution. Whereas it is necessary and expedient to provide for conservation of the environment, improvement of the environmental standards, and control and mitigation of environmental pollution;

It is hereby enacted as follows:

1. Short title and commencement.-

(1) This Act may be called the Bangladesh Environment Conservation Act, 1995.

(2) It shall come into force on such date as the Government may, by notification in the Official Gazette, 'specify and it shall be brought into force in different areas on different dates.

Defination:

"conservation of environment" means improvement of the qualitative and quantitative characteristics of different components of environment as well *as* prevention of degradation of those components; "Department" means the Department of Environment established under section 3 of this Act;

"Director General" means Director General of the Department; "ecosystem" means the inter-dependent and balanced complex association of all components of the environment which can support and influence the conservation and growth of all living organisms;

The Director General shall be appointed by the Government and the terms and conditions of his service shall also be determined by the Government. For proper performance of the functions of the Department, necessary officers and employees shall be appointed in the manner and on the terms and conditions prescribed by rules.

4. Power and functions of the Director General.-

(1) Subject to the provisions of this Act, the Director General may take such measures as he considers necessary and expedient for the conservation of the environment, and improvement of environmental standards, and for the control and mitigation of environmental pollution, and he may issue necessary directions in writing to any person for the discharge of his duties under this Act.

(2) In particular and without prejudice to the generality of the foregoing power, such measures may include all or any of the following:

(a) co-ordination with the activities of any authority or agency having relevance to the objectives of this Act;

(b) prevention of probable accidents which may cause environmental degradation and pollution, undertaking safety measures and determination of remedial measures for such accidents and issuance of directions relating thereto;

(c) giving advice or, as the case may be, issuing directions to the concerned person regarding the environmentally sound use, storage, transportation, import and export of a hazardous substance or its components.

(d) conducting inquiries and undertaking research on conservation, improvement and pollution of the environment and rendering assistance to any other authority or organization regarding those matters;

(e) searching any place, examining any equipment, manufacturing or other processes, ingredients, or substance for the purpose of improvement of the environment, and

control and mitigation of pollution; and issuance of direction or order to the appropriate authority or person for the prevention, control and mitigation of environmental pollution; (collection and publication of information about environmental pollution;

(g) advising the Government to avoid such manufacturing processes, commodities and substances as are likely to cause environmental pollution;

(h) carrying out programs for observation of the quality of drinking water and preparation of reports thereon, and rendering advice or, as the case may be, issuing direction to the concerned persons to follow standards for drinking water.

(3) A direction issued under this section may include matters relating to closure, prohibition or regulation of any industry, undertakings or processes, and the concerned person shall be bound to comply with such direction:

Provided that the

a) Director General shall, before issuing a direction of closure or prohibition of an industry, undertaking or process, send to the owner or occupier thereof a written notice so that the gets reasonable opportunity to make that industry, undertaking or process environmentally sound; and

b) where the Director General considers it appropriate, he may also specify in the notice that actions under sub-section (2) of section 4A may be taken if, pursuant to the notice, measures are not taken to make the relevant activities environmentally sound:

(4) A time limit may be specified by the Director General for carrying out a direction issued under this section.

4A. Assistance from law enforcing agencies and other authorities.-

a. The Director General or a person authorized by him may, for the purpose of exercising any power or performing any function under this Act, request any law enforcing agency, or any other Government or statutory authority to render necessary assistance, and upon such request that agency or authority shall render the assistance.

b. Where the Director General issues a direction for closure, prohibition or regulation of an industry, undertaking or process under section 4(3) and the owner or occupier thereof does not comply with the direction, the Director General may direct the provider of electricity, gas, telephone or water or all such services or any other service provided to the industry, undertaking or process to disconnect the service.

c. Where a direction is issued under sub-section (2), the concerned person or institution shall be bound to take necessary action as specified in the direction.

5. Declaration of ecologically critical area.-

ii. If the Government is satisfied that an area is in an environmentally critical situation or is threatened to be in such situation, the Government may, by notification in the official 'Gazette, declare such area as an ecologically critical area.

iii. The Government shall, in the notification published under subsection (1) a in a separate notification, specify the activities or processes that cannot be initiated or continued in an ecologically critical area.

6. Restrictions regarding vehicles emitting smoke injurious to environment.-

1. A vehicle emitting smoke or gas injurious to health or environment shall not be operated nor shall such vehicles be switched on except for the purpose of test-operation for stopping the emission of such smoke or gas Explanation.- In this section "smoke or gas injurious to health or environment" means any smoke or gas which exceeds the standards fixed by rules.

2. For the purposes of sub-section (1), the Director General or any person authorized by him may test any vehicle at any place or may stop a vehicle in motion for testing, and instantly test it or detain it for necessary period or may, if any vehicle violates that sub-section, seize it and other related documents, or may give necessary direction for testing the vehicle.

3. A report of the test under sub-section (2) shall be admissible as evidence in the proceedings of a court.

4. For the violation of sub-section (1) or a direction given under subsection (2), the driver or, as the case may be, the owner or both shall be liable.

6A. **Restrictions on manufacture,** sale etc. of **articles injurious to environment.-** If, on the advice of the Director General or otherwise, the Government is satisfied that all kinds or any kind of polythene shopping bag, or any Government is satisfied that all kinds or any kind of polythene shopping bag, or any other article made of polyethylene or polypropylene, or any other article is injurious to the environment, the Government may, by notification in the official Gazette, issue *a* 'direction imposing absolute ban on the manufacture, import, marketing, sale, demonstration for sale, stock, distribution, commercial carriage or commercial use, or allow the operation or management of such activities under conditions specified in the notification, and every person shall be bound to comply with such direction :

7. Remedial measures for injury to ecosystem.-

1) If it appears to the Director General that any act or omission of a person *is* causing or has caused, directly or indirectly, injury to the ecosystem or to a person or group of persons, the Director General may determine the compensation and direct the firstly mentioned person to pay it and in an appropriate case also direct him to take corrective measures, or may direct the person to take both the measures; and that person shall be bound to comply with the direction.

2) If a person, to whom *a* direction under sub-section (1) has been issued, fails to comply with the direction, the Director General may file a suit for compensation in the competent court or file a criminal case for failure to comply with the direction or file both kinds of cases.

3) For the purposes of determination of compensation or corrective measures under sub-section (1), the Director General may engage any specialist and other persons.

4) The Government may direct the Director General to take any action under this section and to submit a report thereon.

Information to the Director General regarding environmental degradation or pollution.-

1) Any person affected or likely to be affected as a result of pollution or degradation of the environment may, in the manner prescribed by rules, apply to the Director General for remedy of the damage or apprehended damage.

2) The Director General may hold a public hearing and take other measures for disposing of an application made under this section.

9. Discharge of excessive environmental pollutant etc.-

1) Where, due to an accident or other unforeseen incident, the discharge of any environmental pollutant occurs or is likely to occur in excess of the limit prescribed by the rules, the person responsible and the person in charge of the place of occurrence shall take measures to control or mitigate the environmental pollution.

2) The persons referred to in sub-section (1) shall immediately inform the Director General of the occurrence or the likelihood of such occurrence *as* mentioned in that sub-section.

3) On receipt of information under this section with respect to the accident or other incident, the Director General shall take necessary remedial measures to control or mitigate the environmental pollution, and the said person shall be bound to render assistance and co-operation as required by the Director General.

4) The expenses incurred with respect to remedial measures to control and mitigate the environmental pollution under this section shall be payable to the Director General and may be realized from the persons referred to in sub-section (1) as public demand.

10. Power of entry etc.-

(1) Subject to the provisions of this section, any person generally or specially authorized in this behalf by the Director General shall have the right to enter any building or other place at all reasonable times, with such assistance as he considers necessary for the following purposes, namely to perform his duties under this Act or rules; to inspect any activity carried out at such place or building under this Act or rules or a notice, order or direction issued thereunder; to test or verify any equipment, industrial plant, record, register, document or any other significant material; to conduct a search of a building or place if such person has reason to believe that an offence has been committed in that building or place in contravention of this Act or rule or any notice, order or direction issued thereunder; to seize any equipment, industrial plant, record, register, document or other material that may be used as evidence of the commission of any offence punishable under this Act or rules. The person operating any industry, activity or process or the person handling any hazardous substance shall be bound to render all assistance to the said authorised person in discharging his duties under this Act. The provisions of the Code of Criminal Procedure, 1898 (Act V of 1898) shall be followed in conducting any search and seizure under this section.

11. Power to collect samples etc.-

1) A person authorised in this behalf by the Director General may, in the manner prescribed by rules, collect from any factory, premises or other place any sample of air, water, soil or other substance for analysis.

2) Subject to the provisions of sub-section (3) or (4), as the case may be, the report of a sample collector or the report of a laboratory or both the reports shall, in relation to a sample collected under this section, be admissible as evidence in the concerned proceedings.

3) Subject to the provisions of sub-section (4), the person collecting the sample under sub-section (1) shall serve, in the manner prescribed by rules, a notice to the occupier of the place or his agent specifying his intention to collect any sample; collect samples in presence of that occupier or his agent place the sample in a container and seal the container after recording signatures of himself and of the

occupier or his agent on the container; prepare a report on the collection of the sample and record signatures of himself and of the occupier or his agent; (e) without delay send the container to the laboratory specified by the Director General.

4) Where, after issuing a notice under clause (a) of sub-section (3), the sample collector collects the sample under sub-section (1), but the occupier or his agent remains absent at the time of collecting sample or being present refuses to put signature on the container of the sample and report, then the collector shall, in the presence of two witnesses, secure the container by putting his own signature and seal the sample, and without delay send the samples to the laboratory 'specified by the Director General for analysis and shall state the fact of willful absence of the occupier or his agent or, as the case may be, of his refusal.

Environmental Clearance Certificate.- No industrial unit or project shall be established or undertaken without obtaining, in the manner prescribed by rules, an Environmental Clearance Certificate from the Director General. Formulation of environmental guidelines.- The Government may, by notification in the official Gazette from time to tine, formulate and publish environmental guidelines relating to the control and mitigation of environmental pollution, conservation and improvement of the environment. 14. Appeal.- (1) Any person aggrieved by a notice, order or direction issued under this Act or rules may, within 30 days from the date of issuance of the notice, order or direction, appeal to the 'Appellate Authority constituted by the Government Section 11(2) was substituted by section 6 of Act 9 of 2002.

Provided that the Appellate Authority may, if it is satisfied that for some unavoidable reason the aggrieved person could not file the appeal within that time, extend the period for filing the appeal by a period not exceeding thirty days. The Appellate Authority constituted under sub-section (1) may consist of one or more members:

Provided that where the Appellate Authority consists of more than one member, the Government shall appoint one of the members to be the Chairman of the Authority.

An appeal filed under this section shall be disposed of within 3 months from the date of its filing.

Penalties.- (1) For violation of a provision or for non-compliance of a direction, or for the activities specified in the following Table, the penalty mentioned against them may be imposed :

Penalty that may be imposed

Imprisonment not exceeding 10 years or fine not exceeding 10 lac tab or both. Imprisonment not exceeding 10 years or fine not exceeding 10 lac tab or both. In case of first offence, a fme not exceeding taka 5 (five) thousand; in case of second offence, a fme not exceeding taka 10 (ten) thousand; in case of each subsequent offence, an mprisonment not exceeding 1 year or a fme not exceeding tab 10 (ten) thousand or both.

15A. Confiscation of materials and equipments involved in offence, Where a person is found guilty and sentenced under section 15, all equipments or parts thereof, transport, substance or any other thing used in the commission of the offence may be confiscated under order of the court.

15B. Claim for compensation.- Where a person or a group of persons or the public suffers loss due to violation of a provision of this Act or the rules made thereunder or a direction issued under section7, the Director General may file a suit for compensation on behalf of that person, group or the public.

17. **Offences committed by companies.**

1) Where a company violates any provision of this Act or fails to perform its duties in accordance with a notice issued under this Act or the rules or fails to comply with an order or direction, then the owner, director, manager, secretary or any other officer or agent of the company, shall be deemed to have violated such provision or have failed to perform the duties in accordance with the notice or failed to comply with the order or direction, unless he proves that the violation or failure was beyond his knowledge or that he exercised due diligence to prevent such violation or failure. Explanation.- For the purposes of this section - "company" means any statutory public authority, registered company, partnership firm, and association or organisation, director, in relation to a commercial establishment, also includes any partner or member of the board of directors.

2) Where a company mentioned in sub-section (1) is a body corporate, such company, part from any person charged and convicted under that sub-section, may also be charged and convicted under that sub-section in the same proceedings, but the penalty of fine only may be imposed on such company in a criminal proceedings.

18. **Cognizance of offence and claim for compensation-**

No court shall take cognizance of an offence or receive any suit for compensation under this Act except on the written report of an Inspector of the Department or any other person authorized by the Director General:

Provided that if the competent court is satisfied that a person presented a written request to the said Inspector or authorized person to accept a complaint about an offence or a claim for compensation and no action was ittken within 60 (sixty) days after such request, and that the complain or claim deserves to be taken into cognizance for the purpose of trial, then the court may, after giving the Inspector or the authorized person or the Director General a reasonable opportunity of being heard, directly receive the complaint or claim for compensation without such written report, or may, if it considers appropriate, direct the said Inspector or the authorized person to investigate the offence or claim.

19. **Action taken in good faith.-**

No civil or criminal case or other legal proceeding may be instituted against the Government, Director General, or any other person of the Department for any action which caused or is likely to cause injury to any person, if such action is taken in good faith under this Act or rules.

20. Delegation of Power.-

1) The Government may delegate to the Director General or any other officer any of its powers under this Act or rules.

2) The Director General may 'delegate to any other officer of the Department any of his powers under this Act or rules.

21. Power to make rules.-

1) The Government may, by notification in he official **2**Gazette, make rules for carrying out the purposes of this Act

2) In particular and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters:

a. determination of the standards of air, water, sound, soil and other components of the environment in relation to different areas for different purposes : Provided that the Government may, by notification in the official Gazette, for a specified period suspend the application of such landard, generally or individually, in respect of industries or projects existing at the time of commencement of this Act;

b. regulation of the establishment of industries and other development activities for conservation of environment; determination of safe procedures for the use, storage and transportation of hazardous substances,

c. determination of safety and remedial measures for prevention of accidents which may cause pollution of the environment, of the standards for effluent and discharge; procedures for assessment of the environmental impact of various projects and activities, and procedures for their review and approval; procedures for protection of the environment and ecosystem;

d. determination of fees for obtaining environmental clearance certificates and other services.

22. Repeal and saving.-

1) The Environment Pollution Control Ordinance, 1977 (Act XIII of 1977) is hereby repealed.

2) Notwithstanding such repeal, anything done or any action taken under the repealed Ordinance shall be deemed to have been done under the provisions of this Act.

3) The Department of Environment existing before the commencement of this Act shall be deemed to have been established under section 3, and the Director General and other officers and employees of that Department

The Bangladesh Environment Conservation Act was passed in 1995 for conservation, development of the environmental quality and standard, and for controlling and mitigating environment pollution in Bangladesh. The Government passes the 'Environment Conservation Rules (The Environment Conservation Act, 1995) in 1997 for the implementation of 'Bangladesh Environment Conservation Act." These rules formulate the procedural matters for the execution of the Environment Conservation Act, 1995. Another Act passes called 'Environment Court Act, 2000 in the light of 'Bangladesh Environment Conservation Act, 1995. Under this Act, two Environment Courts (The Environment Court Act, 2000) shall establish in order to dispose of offences relating to environmental problems and pollution (The Environment Court Act, 2000), in the areas of Dhaka and Chittagong. In addition, these courts will work for the other parts of country for the protection and development of environment and it will also meets the environmental hazards such as different pollution, wetland degradations, water logging, biodiversity degradation ecosystems depletion *etc*., in Bangladesh. The Environment Court Act, 2000 is passed based on 'the Bangladesh Environment Conservation Act, 1995 and the 'Bangladesh Environment Conservation Rules, 1997.

The Fertilizer (Regulation) Order, 1995

This Order was passed under the Essential Commodities Act, 1957 for the purposes of regulating the import, manufacture, sale, storing and distribution of license for the above-mentioned objectives. A technical sub-committee newly introduced for advice to the Government and setting up of standards for the fertilizers in the country and assesses their impact on the environment. As Bangladesh is an agro based country, so the chemical fertilizers are used hugely for agriculture production but it is observed that it is going on without compliance of the rules prescribed for the use of the chemical fertilizers. It is regret, because the chemical fertilizer is as harmful as the chemical pesticide on the environment. All kinds of chemicals pollute water mixing with it during the washing of the rainwater. The farmers repeatedly use chemical fertilizers, which are very harmful not only for soil but also injurious impact on fish, other aquatic resources and habitats of the environment. In the country, the technical subcommittee remains rightly but the effectiveness of this committee is quite doubted and questionable because they are hardly found in the implementation procedural areas. It is observed that most of the concerned officers are not interested in collecting information from the field-based research. So it is quite difficult for Bangladesh to develop agriculture in sustainable way.

Water Supply and Sewerage Authority Act, 1996

Under the Water Supply and Sewerage Authority Act, 1996, the authority may frame schemes for, construction, improvement and maintenance sewerage works for collection, pumping, treatment and disposal of sanitary sewerage and industrial waste; collection and disposal of garbage and trash; and construction and maintenance of drainage works. But due to insufficient treatment plant untreated sewerage pollutes localized water bodies near drainage outfall like Rivers, Canals, Beels, or any other open water bodies *etc*. Standard water quality is essential for the development and conservation of fish species and other aquatic resources. In urban areas of Bangladesh, the sewerage systems cover only a few percentage of the city population. The highly polluting load of human excreta partially sinks in the soil but largely reach the low lying areas and the water bodies in and around the cities. In addition, the authority is not at all concerned about the industries effluents. Those are discharging their untreated toxic wastes directly into the water bodies. Thus, it is a constant threat to the aquatic life and aquatic ecosystems of the surrounding water bodies of urban areas.

The Bangladesh Agricultural Research Council Act, 1996

This Act bears a long history before the enactment of this Act, because this Act was passed in 1973 by the name of 'Bangladesh Agricultural Research Council Order, 1973. Later on, this Act was amended in the year of 1976 and 1988 and 1996 respectively. Under the Act the Bangladesh Agricultural Research Council (BARC) is established and the main purpose of this council is to conduct research. In this Act, agriculture includes all kinds of plants, crop production and harvesting, conservation and their initial processing and uses including fruits and with their functions, relating to the promotion of forest resources and conservation, animal husbandry, fertilization, crustaceans and any other aquatic aquaculture *etc*.

The Bangladesh Rice Research Institute Act (Amended in 1996)

This Act was Passed in 1973 and amended in 1996. Under this Act, Rice Research Institute is established for carrying out research to improve cultivation of lands and production and evolution of improved varieties of rice and for matters connected therewith of incidental thereto. In this Act, the Rice Research institute will perform the

functions such as carryout research on various aspects of rice improvement and production, establish researches centre and sub-stations in different regions of Bangladesh for carrying out research on different problems, establish project areas for demonstration of new varieties of rice developed by the Institute and training of farmers for the cultivation of these varieties of rice, publish annual reports, monographs, bulletins and such others literatures relating to rice research and the activities of the institute, establish a laboratory and a library in the institute, train extension officers and progressive farmers in modern improved techniques of rice production.

The Bangladesh Institute of Nuclear Agriculture Ordinance (Amended in 1996)

This Ordinance was passed in 1984 and has amended in 1996. Under this Ordinance the Bangladesh Institute of Nuclear Agriculture is established at Mymensingh. For the implementation of the Ordinance, the institute shall perform the following functions- to undertake research adopting nuclear techniques for the purpose of ensuring a stable and productive agriculture through evolution of new varieties of crops, scientific management of land and water, development of appropriate technology to improve quality and quantity of crops, and development of methods for control of disease and insect and management of pest, to undertake agronomic and soil-plant studies, to carry out demonstration tests or trial runs of new varieties of crops and their management practices.

The Fish and Fish Product (Inspection and Quality Control) Rules, 1997

The Government passes the Fish and Fish Product (Inspection and Quality) Rules in 1989 start with under the section 15 of the Fish and Fish Product (Inspection and Quality Control) Rules are repealed under the same section of the same Ordinance in 1997, which is still in enforcement without any changes from that time. The Landed Centre, Unhealthful Fish, Cured Fish, Canned Fish, Polluted Fish, Drained Weight, Inspector, Rotten, Drinkable Water, and Processing Industry, Service Centre and Health or Salubrity Certificate, *etc.* are defined in this Rule. The Department of Fisheries has three fish inspection and quality control stations located at Khulna, Chittagong and Dhaka facilitated with testing laboratories.

The Environment Conservation Rules, 1997

In exercise of the powers conferred by section 20 of the Bangladesh Environment Conservation Act, 1995 (Act 1 of 1995), the Government is pleased to make the following Rules:

1. **Short Title** . – These Rules may be called the Environment Conservation Rules, 1997.

Definitions. – In these Rules, unless there is anything contrary to the subject or context

"Act" means Bangladesh Environment Conservation Act, 1995 (Act I of 1995).

"Department" means the Department of Environment established under sub-section (1) of section 3 of the Act;

"Form" means a form appended to these Rules.

"local authority" means the City Corporation in relation to a metropolitan area, the Municipality in relation to a municipal area and the Union Parishad in relation to a rural area;

"parameter" means the characteristics of a standard.

"Schedule" means a schedule appended to these Rules.

"section" means a section of the Act.

Declaration of Ecologically Critical Area

(1) The Government shalltake the following factors into consideration while declaring any area as Ecologically Critical Area under sub-section (1) of section 5.

a. human habitat; The definitions are re-arranged in English alphabetical order with reference to the relevant clause of rule 2 as in the Bangla text.
b. ancient monument
c. archeological site
d. forest sanctuary
e. national park
f. game reserve
g. wild animals habitat
h. wetland
i. mangrove
j. forest area
k. bio-diversity of the relevant area; and
l. other relevant factors

(2) The Government shall, in accordance with the standards referred to in rules 12 and 13, specify the activities or processes which can not be continued or initiated in an Ecologically Critical Area.

14. **Vehicles emitting smoke injurious to health and otherwise harmful**

The owner of a vehicle using petrol, diesel and gas as fuel shall, before registration of the vehicle or renewal of its fitness certificate under the Motor Vehicles Ordinance, 1983 (LV of 1983), hereinafter referred to as the said Ordinance, ensure that a catalytic converter or a diesel particulate filter is fitted in the vehicle.

(2) If a vehicle is not fitted with the apparatus mentioned in sub-rule

(1) and if it violates the standards specified in schedule 6 or, as the case may be, 7, the vehicle shall be deemed to be a vehicle emitting smoke harmful to the environment or injurious to health.

5. **Application relating to pollution or degradation of environment**

Any person affected or likely to be affected as mentioned in sub-section (1) of section 8 may apply to the Director General in Form-1 for remedy of the damage or apprehended damage.

(2) The Director General shall, within three months of receiving an application under sub-rule (1), dispose it of in accordance with sub-section (2) of section 8.

6. **Notice for collection of Sample.** – An officer intending to collect a sample under sub-section (3) of section 11 shall send to the occupier of the concerned place or his agent a notice in accordance with Form-2 about his intention.

1 Rule 4 was substituted by MoEF Notification No. SRO 29-Law/2002 of 16 February 2002.

7. **Procedure for issuing Environmental Clearance Certificate**

(1) For the purpose of issuance of Environmental Clearance Certificate, the industrial units and projects shall, in consideration of their site and impact on the environment, be classified into the following four categories:

a. Green

b. Orange – A

c. Orange – B and

d. Red

(2) Industries and projects included in the various categories as

specified in sub-rule (1) have been described in Schedule – 1.

(3) Environmental Clearance Certificate shall be issued to all existing industrial units and projects and to all proposed industrial units and projects falling in the Green Category.

(4) For industrial units and projects falling in the Orange – A, Orange –

B and Red categories, firstly a Location Clearance Certificate and thereafter an Environmental Clearance Certificate shall be issued:

Provided that the Director General may, without issuing a Location Clearance Certificate at the first instance, directly issue Environmental Clearance Certificate if he, on the application of an industrial unit or project, considers it appropriate to issue such certificate to the industrial unit or project.

(5) The entrepreneur of the concerned industrial unit or project shall apply to the concerned Divisional Officer of the Department in Form-3 along with appropriate fees as specified in Schedule-13.

(6) The following documents shall be attached with an application made under sub-rule 5.

(a) **For Green Category:**

i. general information about the industrial unit or project;

ii. exact description of the raw materials and the manufactured product; and

iii. no objection certificate from the local authority;

(b) **For Orange- A Category:**

i. general information about the industrial unit or project;
ii. exact description of the raw materials and the manufactured product;
iii. no objection certificate from the local authority;

iv. process flow diagram;
v. Layout Plan (showing location of Effluent Treatment Plant);
vi. effluent discharge arrangement;
vii. outlines of the plan for relocation, rehabilitation (if applicable);
viii. other necessary information (if applicable)

(c) **For Orange- B Category:**

(i) report on the feasibility of the industrial unit or project (applicable only for proposed industrial unit or project)

(ii) report on the Initial Environmental Examination of the industrial unit or project, and also the process flow diagram, Layout Plan (showing location of Effluent Treatment Plant), design of the Effluent Treatment Plant (ETP) of the unit or project (these are applicable only for a proposed industrial unit or project)

(iii) report on the Environmental Management Plan (EMP) for the industrial unit or project, and also the Process Flow Diagram, Layout Plan (showing location of Effluent Treatment Plant), design of the Effluent Treatment Plant and information about the effectiveness of the ETP of the unit or project, (these are applicable only for an existing industrial unit or project)

(iv) no objection certificate from the local authority

(v) emergency plan relating adverse environmental impact and plan for mitigation of the effect of pollution

(vi) outline of the relocation, rehabilitation plan (where applicable)

(vii) other necessary information (where applicable).

(d) **For Red Category:**

(i) report on the feasibility of the industrial unit or project (applicable only for proposed industrial unit or project)

(ii) report on the Initial Environmental Examination

(iii) (IEE) relating to the industrial unit or project, and

(iv) also the terms of reference for the Environmental

Impact Assessment of the unit or the project and its Process Flow Diagram; or Environmental Impact Assessment report prepared on the basis of terms of reference previously approved by the Department of Environment, along with the Layout Plan (showing location of Effluent Treatment Plant), Process Flow Diagram, design and time

schedule of the Effluent Treatment Plant of the unit or project, (these are applicable only for a proposed industrial unit or project); (iii) report on the Environmental Management Plan (EMP) for the industrial unit or project, and also the Process Flow Diagram, Layout Plan (showing location of Effluent Treatment Plant), design and information about the effectiveness of the Effluent Treatment Plan of the unit or project (these are applicable only for an existing industria l unit or project);

(iv) no objection certificate of the local authority:

(v) emergency plan relating adverse environmental impact and plan for mitigation of the effect of pollution;

(vi) outline of relocation, rehabilitation plan (where applicable);

(vii) other necessary information (where applicable);

(7) If an application for an Environmental Clearance Certificate for an industrial unit or project of Green Category is made under sub-rule (5) along with the relevant documents specified in sub-rule (6), then, within 15 days of the receipt of the application, the certificate shall be issued or the application shall be rejected mentioning appropriate reason for such rejection.

(8) If an application is made under sub-rule (5) along with the relevant documents specified in sub-rule (6), then in the case of an Orange- A Category industrial unit or project, within thirty days of the receipt of the application, and in the case of an Orange-B or Red Category industrial unit or project, within sixty days of the receipt of the application, a Location Clearance Certificate shall be issued or the application shall be rejected mentioning appropriate reasons for such rejection.

(9) Upon receiving Location Clearance Certificate under Sub-rule (8), the entrepreneur–

(a) may undertake activities for land development and infrastructure development;

(b) may install machinery including ETP (applicable for industrial units or projects of range-A and Orange-B Category only);

(c) shall apply for Environmental Clearance Certificate upon completion of the activities specified in clauses (a) and (b), and, without the Environmental Clearance Certificate, shall not have gas line connection, and shall not start trial production in the industrial

unit, and in other cases shall not operate the project (applicable for Orange-A and Orange-B Category industrial units or projects only);

(d) shall submit for approval of the Department the EIA report prepared on the basis of program outlined in IEE Report along with time schedule and ETP design (applicable only for Red Category industrial units or projects);

(10) Where an application is received under clause (c) of sub-rule (9), Environmental Clearance Certificate shall, within fifteen working days in case of industrial unit or project of Orange-A Category and within 30 working days in case of industrial unit or project of Orange-B Category, be issued to the entrepreneur or the application shall be rejected mentioning appropriate reasons.

(11) Where an application is received under clause (d) of sub-rule (9) in relation to an industrial unit or project of Red Category, the EIA report along with the time schedule and ETP design shall, within sixty working days, be approved or the application shall be rejected mentioning appropriate reasons;

(12) After EIA is approved under sub-rule (11), the entrepreneur – (a) may open L/C for importing machineries which shall include machineries relating to ETP; and (b) shall, after installation of ETP, apply for Environmental Clearance Certificate without which he shall not have gas line connection and shall not start trial production in case of an industrial unit, and in other cases shall not start operation of the project.

(13) Where an application under clause (a) of sub-rule (12) is received in relation to an industrial unit or project of Red Category, Environmental Clearance Certificate shall be granted to the concerned entrepreneur within thirty working days, or the application shall be rejected mentioning appropriate reasons.

(14) Where an application is received under sub-rule (5) along with the documents specified in sub-rule (6), Environmental Clearance Certificate shall, within thirty working days in case of an industrial unit or project of Orange-A Category and within sixty working days in case of Orange-B and Red Category, be issued to the concerned entrepreneur or the application will be rejected mentioning appropriate reasons.

17A. **Procedure for issuance of Pollution under Control Certificate**

The owner of a vehicle shall, after causing the vehicle to be fitted with the apparatus mentioned in sub-rule (1) of rule 4 and before registration of the vehicle under the said Ordinance, or, as the case may be, before renewal of the fitness certificate, collect the Pollution under Control Certificate in accordance with Form-4.

17B. **Restriction on importation etc. of catalytic converter and diesel particulate filter**

The importer of catalytic converters or diesel particulate filters shall, before importation and marketing thereof, take written approval of the Director General by demonstrating and proving its effectiveness.

8. **Validity period of Environmental Clearance Certificate**

(1) The period of validity of an Environmental Clearance Certificate shall be, in case of Green Category, three years from the date of its issuance and in other cases one year.

(2) Each Environmental Clearance Certificate shall have to be renewed at least thirty days before expiry of its validity period.

9. **Appeal**

(1) In the petition of an appeal under section 14, the grounds of the appeal against the relevant notice, order or direction shall be stated clearly and briefly.

(2) Each appeal shall be accompanied by the following documents:-

(a) a certified copy of the notice, order or direction against which appeal is filed;

(b) a copy of the Environmental Clearance Certificate (if any);

(c) a Treasury Chalan showing proof of deposit of the appeal fee of Taka one thousand; and

(d) any other paper relevant to the appeal.

10. **Procedure to be followed by Appellate Authority**

1. The Appellate Authority shall fix a date of hearing of the appeal keeping in view of their office work load and the time required to serve notice on the parties.
2. The Appellate Authority shall send to the office against whose notice, order or direction the appeal has been filed a notice mentioning the date of hearing along with a copy of the petition of appeal.

3. For the purpose of disposing an appeal, the Appellate Authority may, at any time, call for all necessary papers and information from the appellant or the opposite party.

11. **Procedure for hearing of appeal**

1) The submission of the appellant in support of the appeal shall be heard on the date fixed for hearing or, if it is adjourned, on a subsequent date.

2) The Appellate Authority may dismiss the appeal if the appellant does not appear upon call for hearing on such date.

3) If the appellant is present but the opposite party is absent, the appeal shall be heard ex-parte.

4) If the appeal is dismissed under sub-rule (2), the appellant may, within the next thirty working days, again apply to the Appellate Authority for allowing the appeal.

5) The Appellate Authority, after hearing the parties or, as the case may be one of the parties, may approve, modify or set aside the disputed notice, order or direction.

6) The Appellate Authority shall record proper reasons in support of their decision, and shall specify the remedy to which the appellate is entitled.

7) Copy of the order of the Appellate Authority shall be sent as soon as possible to the concerned office of the Department and to the Director General.

12. **Determination of environmental standards.–** For carrying out the purposes of clause (a) of sub-section (2) of section 20, the standards for air, water, sound, odor and other components of the environment shall be determined in accordance with the standards specified in Schedules - 2, 3, 4, 5, 6,7 and 8.

13. **Determination of the standards for discharge and emission of waste**

For carrying out the purposes of clause (e) of sub-section (2) of section 20, the standard limits of the discharge of liquid waste and gaseous emission shall be determined in accordance with the standards specified in Schedules 9, 10 & 11, and the standards of the discharge or emission of wastes of various industrial units shall be determined in accordance with standards specified in Schedule -12.

14. **Fees for Environmental Clearance Certificate and its renewal**

The fees for issuance of Environmental Clearance Certificate and its renewal under these Rules shall be payable in accordance with Schedule -13.

15. **Various services and their fees**

(1) Upon application of any person or organization, the Department shall supply analysis report of the samples of water, liquid waste, air and sound and also the information or data derived from such analysis.

(2) For services under sub-rule (1), appropriate fees are payable as described in Schedule -14.

16. **Procedure for payment of fees. –** Fees payable under these Rules shall be deposited with the Bangladesh Bank or a Government Treasury by a Treasury Chalan in favour of the Director General under the Head "65 Miscellaneous Income-tax-free Revenue", and the copy of the Treasury Chalan shall be attached to the relevant application.

17. **Information of special incident.–** If, at any place, discharge or emission of environment pollutants occur in excess of the prescribed standards or if any place is under threat of facing such discharge or emission as a result of any accident or unforeseen incident, then the person or persons in charge of that place shall immediately inform the Director General of the occurrence or the threat.

FORM – 1

Application for remedy

Director General,
Department of Environment,
Government of the People's Republic of Bangladesh,
E-16, Agargaon, Dhaka-1207.

From:
.....
.....

Sir,

I am a person affected, or in apprehension of being affected, by environmental pollution or environmental degradation and hence applying for remedy under subsection.

1) of section-8 of the Bangladesh Environment Conservation Act, 1995, in respect of the following environmental damage/apprehended environmental damage:

1. Name of the person/persons affected or in apprehension of being affected by environmental pollution or environmental degradation.....
2. Reasons, how affected.
3. Site, where affected.
4. Description of damage/apprehended damage.
5. Time, when affected.
6. Name, address, etc., of person/persons/organization involved in causing the damage.
7. Remedy applied for.

Date ..... Signature .....

FORM – 2

Notice of intention for collection of sample

Whereas it is necessary to collect sample of solid waste/waste water/gaseous emission/soil/any pollutant for analysis, on..... (date), at ..... hours, from..... of your industrial unit or project;

Therefore, you are hereby notified of the intention for collection of sample, and you/your appropriate representative are required to be present at the industrial unit or project on the date for putting signature on the container of the sample, and for rendering assistance in collection of the sample.

Sample Collection Officer
Name-
Designation-
M/S.....
.....
.....

Describe the source/location of effluent, waste, stack, etc., from where sample would be collected.

FORM – 3

Application for Environmental Clearance Certificate

Director/Deputy Director,
Department of Environment,
Dhaka Division/Chittagong Division/Khulna Division/Rajshahi Division (Bogra).

Sir,

I do hereby apply for Environmental Clearance Certificate for my proposed industrial unit or project, or for the existing industrial unit or project, and enclose papers and furnish information as follows :

1. (a) Name of the industrial unit or project Address of location of the industrial unit or project
   (b) Address of present office

2. (a) Proposed industrial unit or project : Expected date of starting construction : : Expected date of completion of construction :
   : Expected date of trial production in case of industrial unit, in other cases, date of starting operation of the project:
   (b) Existing industrial unit or project : Date of starting trial production in case of industrial unit, in other cases, date of starting operation of the project:

3. Name of product and quantity to be produced (daily/monthly/yearly):

4. (a) Name of raw materials and quantity required (daily/monthly/yearly):
   (b) Source of raw material :

5. (a) Quantity of water to be used daily :
   (b) Source of water :

6. (a) Name of fuel and quantity required (daily/monthly/yearly):
   (b) Source of fuel :

7. (a) Probable quantity of daily liquid waste :
   (b) Location of waste discharge :
   (c) Probable quantity of daily emission of gaseous substance:
   (d) Mode of emission of gaseous substance:

8. Mouza (village) map indicating “Daag” (plot) number and “Khatiyan” (land tax account) number:

9. Approval of Rajdhani Unnayan Katripakkhya/Chittgong Development Authority/Khulna Development Authority/ Rajshahi Development Authority (if applicable):

10. (a) Design & time schedule of proposed Effluent Treatment Plant:
    (b) Fund allocated :
    (c) Area :

11. Process Flow Diagram :

12. (a) Location map of industrial unit or project :
    (b) Layout plan (with location of Effluent Treatment Plant):

13. (a) IEE/IEA report* (if applicable) :
    (b) Environmental Management Plan* (if applicable):

14. Feasibility Report (if applicable): Seal Signature of the entrepreneur

Name :
Address:
Phone :
Date :

-: Declaration :-

I do hereby declare that all information provided by me in this application are true to the best of my knowledge and no information has been concealed or distorted herein.

(Name & signature of entrepreneur)

***** Each page be countersigned by the person who fills out this application form and by the entrepreneur.

FORM – 4

Pollution under Control Certificate

It is hereby certified that vehicle No ..... of Mr. ..... of ..... (address) emits the following gaseous substances as measured at two-thirds of the maximum rotating speed of the vehicle :-

Parameter Unit Limit of Standards Measurement taken

Black Smoke Hartridge Smoke Unit (HSU) 65
Carbon Monoxide gm/k.m. 24 percent area 04
Hydrocarbon gm/k.m. 02 ppm 180
Oxides of Nitrogen gm/k.m. 02 ppm 600
(2) The measurements so taken do not exceed the standards specified in Schedule-6.
(3) This Certificate shall remain valid till .....
Signature of Director
General/Authorized Officer
Seal
Department of Environment

SCHEDULE – 1

Classification of industrial units or projects based on its location and impact on environment.

(A) GREEN Category

1. Assembling and manufacturing of TV, Radio, etc.
2. Assembling and manufacturing of clocks and watches.
3. Assembling of telephones.
4. Assembling and manufacturing of toys (plastic made items excluded).
5. Book-binding.
6. Rope and mats (made of cotton, jute and artificial fibers).
7. Photography (movie and x-ray excluded).
8. Production of artificial leather goods.
9. Assembling of motorcycles, bicycles and toy cycles.
10. Assembling of scientific and mathematical instruments (excluding manufacturing).
11. Musical instruments.
12. Sports goods (excluding plastic made items).
13. Tea packaging (excluding processing).
14. Re-packing of milk powder (excluding production).
15. Bamboo and cane goods.
16. Artificial flower (excluding plastic made items).
17. Pen and ball-pen.
18. Gold ornaments (excluding production) (shops only).
19. Candle.
20. Medical and surgical instrument (excluding production).
21. Factory for production of cork items (excluding metalic items).
22. Laundry (excluding washing).

Foot Notes:

a. Units of all kinds of cottage industries other than those listed in this Schedule shall remain outside the purview of Environmental Clearance Certificate (Unit of cottage industry means all industrial units producing goods or services in which by full-time or part-time labour of family members are engaged and the capital investment of which does not exceed Taka 5 (five) hundred thousand).

b. No industrial unit listed in this Schedule shall be located in any residential area.

c. Industrial units shall preferably be located in areas declared as industrial zones or in areas where there is concentration of industries or in vacant areas.

d. Industrial units likely to produce sound, smoke, odor beyond permissible limit shall not be acceptable in commercial areas.

(B) ORANGE-A Category

1. Dairy Farm, 10 (ten) cattle heads or below in urban areas and 25 cattle heads or below in rural areas.
2. Poultry (up to 250 in urban areas and up to 1000 in rural areas).
3. Grinding/husking of wheat, rice, turmeric, pepper, pulses (up to 20 Horse Power).
4. Weaving and handloom.
5. Production of shoes and leather goods (capital up to 5 hundred thousand Taka).
6. Saw mill/wood sawing.
7. Furniture of wood/iron, aluminum, etc.,(capital up to 5 hundred thousand Taka).
8. Printing Press.
9. Plastic & rubber goods (excluding PVC).
10. Restaurant.
11. Cartoon/box manufacturing/printing packaging.
12. Cinema Hall.
13. Dry-cleaning.
14. Production of artificial leather goods (capital up to 5 hundred thousand Taka).
15. Sports goods.
16. Production of salt (capital up to 10 hundred thousand Taka).
17. Agricultural machinery and equipment.

18. Industrial machinery and equipment.
19. Production of gold ornaments.
20. Pin, U Pin.
21. Frames of spectacles.
22. Comb.
23. Production of utensils and souvenirs of brass and bronze.
24. Factory for production of biscuit and bread (capital up to 5 hundred thousand Taka).
25. Factory for production of chocolate and lozenge. (capital up to 5 hundred thousand Taka).
26. Manufacturing of wooden water vessels.

(C) ORANGE-B Category

1. PVC items.
2. Artificial fiber (raw material).
3. Glass factory.
4. Life saving drug (applicable to formulation only).
5. Edible oil.
6. Tar.
7. Jute mill.
8. Hotel, multi-storied commercial & apartment building.
9. Casting.
10. Aluminum products.
11. Glue (excluding animal glue).
12. Bricks/tiles.
13. Lime.
14. Plastic products.
15. Processing and bottling of drinking water and carbonated drinks.
16. Galvanizing.
17. Perfumes, cosmetics.
18. Flour (large).
19. Carbon rod.
20. Stone grinding, cutting, polishing.
21. Processing fish, meat, food.

22. Printing and writing ink.
23. Animal feed.
24. Ice-cream.
25. Clinic and pathological lab.
26. Utensils made of clay and china clay/sanitary wares (ceramics).
27. Processing of prawns & shrimps.
28. Water purification plant.
29. Metal utensils/spoons etc.
30. Sodium silicate.
31. Matches.
32. Starch and glucose.
33. Animal feed.
34. Automatic rice mill.
35. Assembling of motor vehicles.
36. Manufacturing of wooden vessel.
37. Photography (activities related to production of films for movie and x-ray).
38. Tea processing.
39. Production of powder milk/condensed milk/dairy.
40. Re-rolling.
41. Wood treatment.
42. Soap.
43. Repairing of refrigerators.
44. Repairing of metal vessel.
45. Engineering works (up to 10 hundred thousand Taka capital.)
46. Spinning mill.
47. Electric cable.
48. Cold storage.
49. Tire re-treading.
50. Motor vehicles repairing works (up to 10 hundred thousand Taka capital).
51. Cattle farm: above 10 (ten) numbers in urban area, and above 25 (twenty five) numbers in rural area.
52. Poultry: Number of birds above 250 (two hundred fifty) in urban area and above 1000 (one thousand) in rural area.
53. Grinding/husking wheat, rice, turmeric, chilly, pulses – machine above 20 Horse Power.

54. Production of shoes and leather goods, above 5(five) hundred thousand Taka capital.
55. Furniture of wood/iron, aluminum, etc., above 5(five) hundred thousand Taka capital.
56. Production of artificial leather goods, above 5(five) hundred thousand Taka capital.
57. Salt production, above 10(ten) hundred thousand Taka capital.
58. Biscuit and bread factory, above 5 (five) hundred thousand Taka capital.
59. Factory for production of chocolate and lozenge, above 5(five) hundred thousand Taka capital.
60. Garments and sweater production.
61. Fabric washing.
62. Power loom.
63. Construction, re-construction and extension of road (feeder road, local road).
64. Construction, re-construction and extension of bridge (length below 100 meters).
65. Public toilet.
66. Ship-breaking.
67. G.I. Wire.
68. Assembling batteries.
69. Dairy and food.

Foot Notes:

(a) No industrial unit included in this list shall be located in any residential area.

(b) Industrial units shall preferably be located in areas declared as industrial zones or in areas where there is concentration of industries or in vacant areas.

(c) Industrial units likely to produce sound, smoke, odor beyond permissible limit shall not be acceptable in commercial areas.

(D) RED Category

1. Tannery.
2. Formaldehyde.
3. Urea fertilizer.
4. T.S.P. Fertilizer.

5. Chemical dyes, polish, varnish, enamel.
6. Power plant.
7. All mining projects (coal, limestone, hard rock, natural gas, mineral oil, etc.)
8. Cement.
9. Fuel oil refinery.
10. Artificial rubber.
11. Paper and pulp.
12. Sugar.
13. Distillery.
14. Fabric dying and chemical processing.
15. Caustic soda, potash.
16. Other alkalis.
17. Production of iron and steel.
18. Raw materials of medicines and basic drugs.
19. Electroplating.
20. Photo films, photo papers and photo chemicals.
21. Various products made from petroleum and coal.
22. Explosives.
23. Acids and their salts (organic or inorganic).
24. Nitrogen compounds (Cyanide, Cyanamid etc.).
25. Production of plastic raw materials (PVC, PP/Iron, Polyesterin etc.)
26. Asbestos.
27. Fiberglass.
28. Pesticides, fungicides and herbicides.
29. Phosphorus and its compounds/derivatives.
30. Chlorine, fluorine, bromine, iodine and their compounds/derivatives.
31. Industry (excluding nitrogen, oxygen and carbon dioxide).
32. Waste incinerator.
33. Other chemicals.
34. Ordnance.
35. Nuclear power.
36. Wine.
37. Non-metallic chemicals not listed elsewhere.

38. Non-metals not listed elsewhere.
39. Industrial estate.
40. Basic industrial chemicals.
41. Non-iron basic metals.
42. Detergent.
43. Land-filling by industrial, household and commercial wastes.
44. Sewage treatment plant.
45. Life saving drugs.
46. Animal glue.
47. Rodenticide.
48. Refractories.
49. Industrial gas (Oxygen, Nitrogen & Carbon-dioxide).
50. Battery.
51. Hospital.
52. Ship manufacturing.
53. Tobacco (processing/cigarette/Biri-making).
54. Metallic boat manufacturing.
55. Wooden boat manufacturing.
56. Refrigerator/air-conditioner/air-cooler manufacturing.
57. Tyre and tube.
58. Board mills.
59. Carpets.
60. Engineering works: capital above 10 (ten) hundred thousand Taka.
61. Repairing of motor vehicles: capital above 10 (ten) hundred thousand Taka.
62. Water treatment plant.
63. Sewerage pipe line laying/relaying/extension.
64. Water, power and gas distribution line laying/relaying/extension.
65. Exploration/extraction/distribution of mineral resources.
66. Construction/reconstruction/expansion of flood control embankment, polder, dike, etc.
67. Construction/reconstruction/expansion of road (regional, national & international).
68. Construction/reconstruction/expansion of bridge (length 100 meter and above).
69. Murate of Potash (manufacturing).

Foot Notes:

(a) No industrial unit included in this list shall be allowed to be located in any residential area.

(b) Industrial units shall preferably be located in areas declared as industrial zones or in areas where there is concentration of industries or in vacant areas.

(c) Industrial units likely to produce sound, smoke, odor beyond permissible limit shall not be acceptable in commercial areas.

(d) After obtaining location clearance on the basis of Initial Environment Examination (IEE) Report, the Environmental Impact Assessment (EIA) Report in accordance with the approved terms of reference along with design of ETP and its time schedule shall be submitted within approved time limit.

SCHEDULE – 2

Standards for Air

Density in microgram per cusec meter Sl.

No.

Categories of Area Suspended Particulate Maters (SPM)

Sulphurdioxide

Carbon

Monoxide

Oxides

Nitrogen

a. Industrial and mixed 500 120 5000 100

b. Commercial and mixed 400 100 5000 100

c. Residential and rural 200 80 2000 80

d. Sensitive 100 30 1000 30

Notes:

(1) At national level, sensitive area includes monuments, health center, hospital, archeological site, educational institution, and government designated areas (if any).
(2) Industrial units located in areas not designated as industrial areas shall not discharge pollutants which may contribute to exceeding the standard for air surrounding the areas specified at Sl. nos. c and d above.
(3) Suspended Particulate Matter means airborne particles of a diameter of 10 micron or less.

SCHEDULE – 3

Standards for Water

[See Rule 12]

(A) Standards for inland surface water Best Practice based classification Parameter

pH BOD mg/l

DO mg/l

Total Coliform number/100

a. Source of drinking water for supply only after disinfecting: 6.5-8.5 2 or less 6 or above 50 or less
b. Water usable for recreational activity : 6.5 – 8.5 3 or less 5 of more 200 or less
c. Source of drinking water for supply after conventional treatment : 6.5 – 8.5 6 of less or more 5000 or less
d. Water usable by fisheries: 6.5 – 8.5 6 of less 5 or more ---
e. Water usable by various process and cooling industries : 6.5 – 8.5 10 or less 5 or more 5000 or less
f. Water usable for irrigation: 6.5 – 8.5 10 or less 5 or more 1000 or less

Notes:

1. In water used for pisiculture, maximum limit of presence of ammonia as Nitrogen is 1.2 mg/l.
2. Electrical conductivity for irrigation water – 2250 □mhoms/cm (at a temperature of 25^0C); Sodium less than 26%; boron less than 0.2%.

(B) Standards for drinking water Sl. No. Parameter Unit Standards 1 2 3 4

1. Aluminum mg/l 0.2
2. Ammonia (NH3) ,, 0.5
3. Arsenic ,, 0.05
4. Balium ,, 0.01
5. Benzene ,, 0.01
6. BOD5 20^0C ,, 0.2
7. Boron ,, 1.0
8. Cadmium ,, 0.005
9. Calcium ,, 75
10. Chloride ,, 150 – 600
11. Chlorinated alkanes carbontetrachloride ,, 0.01 1.1 dichloroethylene ,, 0.001
12. 1.2 dichloroethylene ,, 0.03 tetrachloroethylene ,, 0.03 trichloroethylene ,, 0.09
13. Chlorinated phenols - pentachlorophenol mg/l 0.03 - 2.4.6 trichlorophenol ,, 0.03
14. Chlorine (residual) ,, 0.2
15. Chloroform ,, 0.09
16. Chromium (hexavalent) ,, 0.05
17. Chromium (total) ,, 0.05
18. COD ,, 4
19. Coliform (fecal) n/100 ml 0
20. Coliform (total) n/100 ml 0
21. Color Hazen unit 15
22. Copper mg/l 1
23. Cyanide ,, 0.1
24. Detergents ,, 0.2
25. DO ,, 6
26. Fluoride ,, 1
27. Hardness (as CaCO3) ,, 200 – 500
28. Iron ,, 0.3 – 1.0
29. Kjeldhl Nitrogen (total) ,, 1
30. Lead ,, 0.05
31. Magnesium ,, 30 – 35
32. Manganese ,, 0.1
33. Mercury ,, 0.001

34. Nickel ,, 0.1
35. Nitrate ,, 10
36. Nitrite ,, ^{0}01
37. Odor ,, Odorless
38. Oil and grease ,, 0.01
39. pH ,, 6.5 – 8.5
40. Phenolic compounds ,, 0.002
41. Phosphate ,, 6
42. Phosphorus ,, 0
43. Potassium ,, 12
44. Radioactive materials Bq/l 0.01 (gross alpha activity)
45. Radioactive materials Bq/l 0.1 (gross beta activity)
46. Selenium mg/l 0.01
47. Silver ,, 0.02
48. Sodium ,, 200
49. Suspended particulate matters ,, 10
50. Sufide ,, 0
51. Sulfate ,, 400
52. Total dissolved solids ,, 1000
53. Temperature □C 20-30
54. Tin mg/l 2
55. Turbidity JTU 10
56. Zinc mg/l 5

SCHEDULE – 4

Standards for Sound Sl. Category of areas Standards determined at dBa unit

No. Day Night

a. Silent zone 45 35
b. Residential area 50 40
c. Mixed area (mainly residential area, and also simultaneously used for commercial and industrial purposes) 60 50
d. Commercial area 70 60
e. Industrial area 75 70

Notes:

1. The time from 6 a.m. to 9 p.m. is counted as daytime.
2. The time from 9 p.m. to 6 a.m. is counted as night time.
3. Area up to a radius of 100 meters around hospitals or educational institutions or special institutions/ establishments identified/to be identified by the Government is designated as Silent Zones where use of horns of vehicles or other audio signals, and loudspeakers are prohibited.

SCHEDULE – 5

Standards for Sound originating from Motor Vehicles or Mechanized Vessels Category of Vehicles Unit Standards Remarks

*Motor Vehicles (all types) dBa 85 As measured at a distance of 7.5 meters from exhaust pipe.

100 As measured at a distance of 0.5 meter from exhaust pipe.

Mechanized Vessels dBa 85 As measured at a distance of 7.5 meters from the vessel which is not in motion, not loaded and is at two thirds of its maximum rotating speed. 100 As measured at a distance of 0.5 meter from the vessel which is in the same condition as above.

* At the time of taking measurement, the motor vehicle shall not be in motion and its engine conditions shall be as follows:

(a) Diesel engine – maximum rotating speed.

(b) Gasoline engine –at two thirds of its maximum rotating speed and without any load.

(c) Motorcycle – If maximum rotating speed is above 5000 rpm; twothirds of the speed, and if maximum rotating speed is less than 5000 rpm, three-fourth of the speed.

SCHEDULE – 6

Standards for Emission from Motor Vehicles Parameter Unit Standard Limit

Black Smoke Hartridge Smoke Unit (HSU) 65

Carbon Monoxide gm/k.m. 24 percent area 04

Hydrocarbon gm/k.m. 02 ppm 180

Oxides of Nitrogen gm/k.m. 02 ppm 600

* As measured at two thirds of maximum rotating speed.

SCHEDULE – 7

Standards for Emission from Mechanized Vessels

Parameter Unit Standard Limit

Black Smoke* Hartridge Smoke Unit

(HSU)

65

* As measured at two thirds of maximum rotating speed.

SCHEDULE – 8

Standards for Odor Parameter Unit Standard Limit

Acetaldehyde ppm 0.5 – 5

Ammonia ,, 1 – 5

Hydrogen Sulfide ,, 0.02 – 0.2

Methyl Disulfide ,, 0.009 – 0.1

Methyl Sulfide ,, 0.01 – 0.2

Styrene ,, 0.4 – 2.0

Trim ethylamine ,, 0.005 – 0.07

SCHEDULE – 9

Standards for Sewage Discharge

Parameter Unit Standard Limit

BOD miligram/l 40

Nitrate ,, 250

Phosphate ,, 35

Suspended Solids (SS) ,, 100

Temperature Degree Centigrade 30

Coliform number per 100 ml 1000

SCHEDULE – 10

Standards for Waste From Industrial Units or Projects Waste Sl. No.

Parameter Unit Places for determination of standards Inland Surface Water

Public Sewerage system connected to treatment at second stage Irrigated Land

1. Ammonical Nitrogen (as elementary N) mg/l 50 75 75
2. Ammonia (as free ammonia) ,, 5 5 15
3. Arsenic (as) ,, 0.2 0.05 0.2
4. BOD5 at 20oC ,, 50 250 100
5. Boron ,, 2 2 2
6. Cadmium (as CD) ,, 0.50 0.05 0.05
7. Chloride ,, 600 600 600
8. Chromium (as total Cr) ,, 0.5 1.0 1.0
9. COD ,, 200 400 400 10 Chromium (as hexavalent Cr) 0.1 1.0 1.0
10. Copper (as Cu) ,, 0.5 3.0 3.0
11. Dissolved Oxygen (DO) ,, 4.5 – 8 4.5 – 8 4.5 – 8
12. Electro-conductivity (EC) micro mho/ cm
13. 200 1200 1200
14. Total Dissolved Solids ,, 2,100 2,100 2,100
15. Fluoride (as F) ,, 2 15 10
16. Sulfide (as S) ,, 1 2 2
17. Iran (as Fe) ,, 2 2 2
18. Total Kjeldahl Nitrogen (as N) ,, 100 100 100
19. Lead (as Pb) ,, 0.1 1.0 0.1
20. Manganese (as Mn) ,, 5 5 5
21. Mercury (as Hg) ,, 0.01 0.01 0.01
22. Nickel (as Ni) ,, 1.0 2.0 1.0
23. Nitrate (as elementary N) mg/l 10.0 Not yet Fixed 10
24. Oil and Grease ,, 10 20 10
25. Phenolic Compounds (as C6H5OH) ,, 1.0 5 1

26. Dissolved Phosphorus (as P) ,, 8 8 15
27. Radioactive substance To be specified by Bangladesh Atomic Energy Commission
28. pH 6 – 9 6 – 9 6 – 9
29. Selenium (as Se) mg/l 0.05 0.05 0.05
30. Zinc (as Zn) Degree 5 10 10
31. Total Dissolved Solids ,, 2,100 2,100 2,100
32. Temperature Centig rade 40 40 40- Summer 45 45 45- Winter
33. Suspended Solids (SS) mg/l 150 500 200
34. Cyanide (as Cn) ,, 0.1 2.0 0.2

Notes:

1) These standards shall be applicable to all industries or projects other than those specified under the heading "Standards for sectorwise industrial effluent or emission."
2) Compliance with these standards shall be ensured from the moment an industrial unit starts trial production, and in other cases, from the moment a project starts operation.
3) These standards shall be inviolable even in case of any sample collected instantly at any point of time. These standards may be enforced in a more stringent manner if considered necessary in view of the environmental conditions of a particular situation.
4) Inland Surface Water means drains/ponds/tanks/water bodies/ditches, canals, rivers, springs and estuaries.
5) Public sewerage system means treatment facilities of the first and second stage and also the combined and complete treatment facilities.
6) Irrigable land means such land area which is sufficiently irrigated by waste water taking into consideration the quantity and quality of such water for cultivation of selected crops on that land.
7) Inland Surface Water Standards shall apply to any discharge to a public sewerage system or to land if the discharge does not meet the requirements of the definitions in notes 5 and 6 above.

SCHEDULE – 11

Standards for Gaseous Emission from Industries or Projects

Sl.No. Parameters Standard present in a unit of mg/Nm3 1 2 3

1. Particulate

(a) Power plant with capacity of 200 Megawatt or above 150

(b) Power plant with capacity less than 200 Megawatt. 350

2. Chlorine 150

3. Hydrochloric acid vapor and mist 350

4. Total Fluoride F 25

5. Sulfuric acid mist 50

6. Lead particulate 10

7. Mercury particulate 0.2

8. Sulfur dioxide kg/ton acid

(a) Sulfuric acid production (DCDA* process) 4

(b) Sulfuric acid production (SCSA* process) 10

(* DCDA: Double Conversion, Double Absorption;

SCSA: Single Conversion, Single Absorption.)

Lowest height of stack for dispersion of sulfuric acid (in meter).

(a) Coal based power plant

(1) 500 Megawatt or above 275

(2) 200 to 500 Megawatt 220

(3) Less than 200 Megawatt 14(Q)0.3

(b) Boiler

(1) Steam per hour up to 15 tons 11

(2) Steam per hour more that 15 tons 14(Q)0.3

9. Oxides of Nitrogen

(a) Nitric acid production 3 kg/ton acid

(b) Gas Fuel based Power Plant 50 ppm

(1) 500 Megawatt or above 50 ppm

(2) 200 to 500 Megawatt 40 ppm

(3) Below 200 Megawatt 30 ppm

(c) Metallurgical oven 200 ppm

10. Kiln soot and dust mg/Nm3

(a) Blast Furnace 500

(b) Brick Kiln 1000

(c) Coke oven 500

(d) Lime Kiln 250

SCHEDULE – 12

Standards for Sector-wise Industrial Effluent or Emission

(A) Fertilizer Plant Nitrogenous fertilizer plant Effluent (liquid waste) Parameters Standard presence in a unit of mg/l

As Nitrogen 50 (New) 100 (Old)

Total Kjieldahl Nitrogen 100 (Old) 250 (New) pH 6.5 – 8

Chromium at discharge point of the chromate removal plant (as total Cr) 0.5

Hexavalent Chromium 0.1

Suspended Solids 100

Oil and Grease 10

Wastewater flow 10m3/t Urea

Gaseous Emission Source Parameters Standard of presence in a unit of mg/Nm3

Urea Prilling Tower Particulate 150 dry de dusting 50 wet de dusting and new plant

Phosphatic Effluent (liquid waste) Parameters Standard of presence in a unit of mg/l

Fluoride at the exhaust of Fluoride removal plant (as F) 10

Phosphate (as P) 5

Suspended Solids Chromium at the discharge point of 100

Chromate removal plant (as Cr)

Total 0.5

Hexavalent Cr 0.1

Oil and Grease 10

Gaseous Emission Source Parameters Standard of presence in a unit of mg/Nm3

Granulation, Mixing and Grinding section

Particulate 150

Phosphoric acid

preparation

Total Fluoride (as F) 25

Sulfuric acid plant Sulfur dioxide

DCDA 4 kg/t of Sulfuric acid (100%)

SCSA 10 kg/t of Sulfuric acid (100%) Sulfuric acid

(B) Composite textile plant and large processing unit (in which capital investment is more than thirty million Taka) Effluent (liquid waste) Parameters Standard and presence in a unit of mg/l

pH 6.5 – 9

Suspended solids 100

BOD5 20oC 150

Oil and Grease 10

Total dissolved solids 2100

Wastewater flow 100 per kg of fabric processed

Note: BOD limit of 150 mg/l implies only with physico chemical processing. Special parameters based on classification of dyes used Total Chromium, as Cr 2 Sulfide, as S 2

Phenolic compounds, as C6H5OH 5

(C) Pulp and Paper Industry Gaseous Effluent Parameter Standard and presence in a unit of mg/l, except pH

Large plant with production capacity of above 50 tons per day.

Small plant with production capacity of less than 50 tons per day.

pH 6 – 9 6 – 9

Suspended Solids 100 100

BOD5 20oC 30 50

COD 300 400

Wastewater flow 200 cubic meter per ton of paper

200 cubic meter per ton of paper produced of agricultural raw materials.

75 cubic meter per ton of paper produced of wastepaper.

(D) Cement Indus try Gaseous Emission

1. Basic units for manufacturing cement

Source Parameters Standards for presence in a unit of mg/Nm3

All sections Particulate 250

2. Clinker Grinding units

Source Parameters Standards for presence in a unit of mg/Nm3

All sections Particulate

Daily production capacity above 1000 ton 200

Daily production capacity 200-1000 ton 300

Daily production capacity up to 200 ton 400

(E) Boiler of Industrial unit Gaseous Emission Parameters Standards for presence in a unit of mg/Nm3

1. Soot and particulate (fuel based)

(a) Coal 500

(b) Gas 100

(c) Oil 300

2. Oxides of Nitrogen (fuel based)

(a) Coal 600

(b) Gas 150

(c) Oil 300

(F) Nitric Acid Plant Gaseous Emission Parameters Standards for presence in a unit of mg/Nm3

Oxide of Nitrogen 3 kg/ton of weak nitric acid produced

(G) Distillery Effluent (liquid waste) Parameters Standards for presence in a unit of mg/l

pH 6 – 9

Suspended solids 150

BOD5 20oC 5000 (standard for 2 years transitional period)

500 (standard for 74 years transitional period)

Oil and Grease 10

(H) Sugar Industry Effluent (liquid waste) Parameters Standard for presence in a unit of mg/l

pH 6 – 9

Suspended solids 150

BOD5 20oC 50

Oil and Grease 10

Wastewater per ton of sugarcane crushing (in Cubic meter) 0.5

Gaseous Emission Boiler using baggasse

Particulate, mg/Nm3 Stepgrade 250

Pulsating/ 500

horse

shoe

Spreader

(I) Tannery Industry Effluent (liquid waste) Parameters Standard for presence in a unit of mg/l

pH 6 – 9

Suspended solids 150

BOD5 20oC 100

Sulfide (as S) 1

Total Chromium (as Cr) 2

Oil and Grease 10

Total dissolved solids 2100

Wastewater per ton of hide processing (in cubic meter)

(J) Food Processing, Fish Canning, Dairy, Starch and Jute Industries Effluent (liquid waste) Parameters Maximum Limit of Values in mg/l

Suspended solids 6 – 9

BOD5 20oC 150

Wastewater flow 100

Starch 8 Cubic Meter per Ton of raw materials

Jute processing 1.5 Cubic Meter per Ton product

Dairy products 3 Cubic Meter per Ton of Milk

(K) Crude Oil Refinery Gaseous Emission Parameter Source Standards for maximum presence Unit

Sulfur dioxide Distillation 0.25 kg/ton

Catalytic Cracker 2.5 kg/ton

Effluent (liquid waste) Parameters Standards for maximum presence Unit

Suspended solids (SS) 100 mg/l

Oil and Grease 10,,

BOD5 20oC 30,,

Phenol 1,,

Sulfide (as S) 1 ,,

Wastewater flow 700 Cubic Meter/1000 Ton of treated crude oil

1 "SCHEDULE – 13

Fees for Environmental Clearance Certificate or Renewal

1. Industrial unit or project

Investment (in Taka) Fees for Environmental

Clearance Certificate (in Taka)

Certificate

Renewal Fee

(a) Between Tk. 100,000 and 5,00,000 Tk. 1,500 One-fourth of the fees in Column (2).

(b) Between Tk. 5,00,000 and 10,00,000 Tk. 3,000 -Do-

(c) Between Tk. 10,00,000 and 50,00,000 Tk. 5,000 -Do-

(d) Between Tk. 50,00,000 and 10,000,000 Tk. 10,000 -Do-

1 Schedule-13 was substituted by Notification S.R.O. No. 234-Law/2002 dated 24/08/2002 and came into force on 26/08/2002 being the date of publication in Bangladesh Gazette extraordinary issue.

(e) Between Tk. 10,000,000 and 2,00,000,000 Tk. 25,000 One-fourth of the fees in Column (2).

(f) Between Tk. 2,00,000,000 and 5,00,000,000 Tk. 50,000 -Do-

(g) Above Tk. 5,00,000,000 Tk. 1,00,000 -Do-

1 SCHEDULE – 14

Fees to be realized by the Department of Environment for supplying various analytical information or data or test results of samples of water, effluent, air and sound.

(A) Sample of water or effluent

Parameter Fee (in Taka)

1. Coliform 1,000
2. Chlorine 500
3. Total hardness 500
4. Iron 800
5. Calcium 800
6. Magnesium 800
7. Colour 150
8. Electrical Conductivity (EC) 200
9. pH 200
10. Suspended Solids (SS) 600
11. Total Solids (TS) 400
12. Total Dissolved Solids (TDS) 400
13. Ammonia Nitrogen 800
14. Arsenic 1,000
15. Boron 800
16. Cadmium 1,000
17. COD 800
18. BOD 800
19. Chloride 500
20. Chromium, Hexavalent 1,000
21. Chromium, Total 1,000
22. Cyanide 800
23. Fluoride 800
24. Lead 1,000

25. Mercury 1,000
26. Nickel 1,000
27. Organic Nitrogen 800
28. Oil and Grease 600
29. Phosphate 800
30. Phenol 800
31. Sulfate 800
32. Zinc 1,000
33. Temperature 150
34. Turbidity (GTU) 200
35. Turbidity (NTU) 200
36. P-Alcanity 500
37. T-Alcanity 400
38. Acidity 400
39. Carbon dioxide 400
40. Calcium Hardness 500
41. DO 600
42. Nitrate 800
43. Nitrite 800
44. Silica 600

(B) Sample of Air

Parameter Fee (in Taka)

1. S.P.M. 1,000
2. Sulfur dioxide 1,000
3. Nitrous dioxide 1,000
4. Carbon Monoxide 600
5. Lead 1,000

(C) Sample of Sound

Parameter Fee (in Taka)

1. Sound 400

(D) For Supplying Analytical Information or Data

1. Annual information or data about Surface Water (except river water) and Ground Water collected by monitoring stations of Dhaka Division/Chittagong Division and Sylhet Division/Khulna Division and Barisal Division/Rajshahi Division.

a. For Government organizations 4,500
b. For Others 9,000

2. Annual information or data about river water collected by monitoring stations of Dhaka Division/Chittagong Division and Sylhet Division/ Khulna Division and Barisal Division/Rajshahi Division.

a. For Government organizations 6,000
b. For Others 9,000

3. Annual information or data about Air collected by monitoring stations of Dhaka Division/Chittagong Division and Sylhet Division/Khulna Division and Barisal Division/Rajshahi Division.

a. For Government organizations 3,500
b. For Others 6,000"

National Water Policy 1999

Water is central to the way of life in Bangladesh and the single-most important resource for the well-being of its people. It sustains an extremely fragile natural environment and provides livelihood for millions of people. Unfortunately, it is not infinite and cannot be treated as a perpetual free gift of nature to be used in any manner chosen. The unitary nature of water makes its use in one form affect the use in another. Its availability for sustenance of life, in both quantitative and qualitative terms, is a basic human right and mandates its appropriate use without jeopardising the interest of any member of the society. Availability of water, including rainwater, surface water, and groundwater, in usable forms calls for its sustainable development, a responsibility that has to be shared collectively and individually by members of the society. Private users of water are the principal agents for its development and management and private investments need to be actively promoted in the water sector, ensuring equal opportunity to all. However, development of water resources often requires large and lumpy capital investment and generates economies of scale, which justifies public sector involvement. Government's

role also becomes important because of the necessity of protecting the needs of the society at large and addressing important environmental as well as social issues such as poverty alleviation and human resources development. Water resources management in Bangladesh faces immense challenge for resolving many diverse problems and issues. The most critical of these are alternating flood and water scarcity during the wet and the dry seasons, ever-expanding water needs of a growing economy and population, and massive river sedimentation and bank erosion. There is a growing need for providing total water quality management (checking salinity, deterioration of surface water and groundwater quality, and water pollution), and maintenance of the eco-system. There is also an urgency to satisfy multi-sector water needs with limited resources, promote efficient and socially responsible water use, delineate public and private responsibilities, and decentralise state activities where appropriate. All of these have to be accomplished under severe constraints, such as the lack of control over rivers originating outside the country's borders, the difficulty of managing the deltaic plain, and the virtual absence of unsettled land for building water structures.

The water policy provided hereunder, lays down the broad principles of development of water resources and their rational utilisation under these constraints. It will help guide both public and private actions in the future for ensuring optimal development and management of water that benefits both individuals and the society at large.

2. Declaration of National Water Policy

As water is essential for human survival, socio-economic development of the country and preservation of its natural environment, it is the policy of the Government of Bangladesh that all necessary means and measures will be taken to manage the water resources of the country in a comprehensive, integrated and equitable manner. The policies enunciated herein are designed to ensure continued progress towards fulfilling the national goals of economic development, poverty alleviation, food security, public health and safety, decent standard of living for the people and protection of the natural environment.

The National Water Policy will be reviewed periodically and revised as necessary. It will guide management of the country's water resources by all the concerned ministries, agencies, departments, and local bodies that are assigned responsibilities for the development, maintenance, and delivery of water and water related services as well as the private users and developers of water resources.

3. Objectives of National Water Policy

The water policy of the government aims to provide direction to all agencies working with the water sector, and institutions that relate to the water sector in one form or another, for achievement of specified objectives. These objectives are broadly:

a. To address issues related to the harnessing and development of all forms of surface water and ground water and management of these resources in an efficient and equitable manner

b. To ensure the availability of water to all elements of the society including the poor and the underprivileged, and to take into account the particular needs of women and children

c. To accelerate the development of sustainable public and private water delivery systems with appropriate legal and financial measures and incentives, including delineation of water rights and water pricing

d. To bring institutional changes that will help decentralise the management of water

e. resources and enhance the role of women in water management

f. To develop a legal and regulatory environment that will help the process of decentralisation, sound environmental management, and improve the investment climate for the private sector in water development and management

g. To develop a state of knowledge and capability that will enable the country to design future water resources management plans by itself with economic efficiency, gender equity, social justice and environmental awareness to facilitate achievement of the water management objectives through broad public participation

4. National Water Policy

The policies set forth herein are considered essential for addressing the objectives of improved water resources management and protection of the environment. Every public agency, every community, village and each individual has an important role to play in ensuring that the water and associated natural resources of Bangladesh are used judiciously so that the future generations can be assured of at least the same, if not better, availability and quality of those resources.

4.1 River Basin Management

Basin planning provides the most rational basis of development of water resources under the influence of one or more major rivers. International river basins, however, such as the Ganges basin, the Brahmaputra basin, and the Meghna basin present special problems. Due to its location as the lower-most riparian, Bangladesh has no control over the rivers entering through its borders. The adverse effects of this are the floods and water scarcity, which occur frequently. Although the 1996 Treaty on Sharing of the Ganges Waters with India has brought some relief to the drought-prone area of the southwest, the water shortage problem during the dry season is likely to aggravate in the Ganges and other basins with rising demands of the increasing population. It is, however, encouraging to note that the relevant provision of the treaty will provide the basis in the futrue for discussion on sharing of waters of the common rivers.

It may take considerable effort and time for Bangladesh to work out joint plans for different river basins with other co-riparian countries. As a long-term measure, therefore, it is the policy of the government to undertake essential steps for realising basin-wide planning for development of the resources of the rivers entering its borders.

The Government will endeavour to enter into agreements with co-riparian countries for sharing the waters of international rivers, data exchange, resource planning and long-term management of water resources under normal and emergency conditions of flood, drought and water pollution. While moving towards the attainment of basin-wide plans in the long run, it will also be necessary for Bangladesh to concentrate on the development of individual hydrological areas to meet short and intermediate term requirements.

The policy of the Government of Bangladesh, in the short and intermediate term, for fostering international cooperation in water management is, in italies letter, to:

a. Work with co-riparian countries to establish a system for exchange of information and data on relevant aspects of hydrology, morphology, water pollution, ecology, changing
b. watershed characteristics, cyclone, drought, flood warning, etc., and to help each other
c. understand the current and emerging problems in the management of the shared water sources.
d. Work with co-riparian countries for a joint assessment of all the international rivers flowing through their territories for better understanding of the overall basins' potentials.

e. Work jointly with co-riparian countries to harness, develop, and share the water resources of the international rivers to mitigate floods and augment flows of water during the dry season.

f. Make concerted efforts, in collaboration with co-riparian countries, for management of the catchment areas with the help of afforestation and erosion control for watershed preservation and reduction of land degradation.

g. Work jointly with co-riparian countries for the prevention of chemical and biological pollution of the rivers flowing through these countries, by managing the discharge of industrial, agricultural and domestic pollutants generated by human action.

h. Seek international and regional cooperation for education, training, and research in water management.

4.2 Planning and Management of Water Resources

The Government recognizes that the process of planning and managing water resources requires a comprehensive and integrated analysis of relevant hydrological, topographical, social, political, economic, environmental and institutional factors across all related water-using sectors.

The intricate nature of drainage systems within the country requires that activity for planning and management of the nation's river systems is undertaken within the context of hydrological regions. The principal river systems create natural boundaries for these regions. The hilly areas of the east form another hydrological region.

Henceforth, to address these issues the policy of the Government will be as follows:

a. The Water Resources Planning Organisation (WARPO) will delineate the hydrological regions of the country, based on appropriate natural features, for planning the development of their water resources.

b. WARPO will prepare, and periodically update, a National Water Management Plan (NWMP) addressing the overall resource management issues in each region and the whole of Bangladesh, and providing directions for the short, intermediate, and long runs. The plan will be executed by different agencies as determined by the Government from time to time.

c. The NWMP and all other related plans will be prepared in comprehensive and integrated manner, with regard for the interests of all water-related sectors. The planning methodology will ensure co-operation across sectors and people's participation in the process.

Within the macro framework of the NWMP:

d. Sector agencies of the Government and local bodies will prepare and implement subregional and local water-management plans in conformance with the NWMP and approved Government project appraisal guidelines. The Executive Committee of the National Water Resources Council (ECNWRC) will resolve any interagency conflict in this regard.

e. The Bangladesh Water Development Board (BWDB) will implement all major surface water development projects and other FCDI projects with command area above 1000 hectares. The Local Government will implement FCDI projects having a command area of 1000 hectares or less after identification and appraisal through an interagency Project Appraisal Committee.

f. Any interagency dispute will be resolved by means prescribed by the Government.

g. The participation of all project affected persons, individually and collectively, will be

h. ensured in the planning, design, implementation, and operation and maintenance (O&M) of publicly funded surface water resources development plans and projects. Local

i. Governments (Parishads) will be the principal agencies for coordinating these efforts.

j. Community level self-help groups (private) and Non-Government Organisations will also be relied on to assist in the participatory process.

The Government will further:

k. Frame rules, procedures, and guidelines for combining water-use and land-use planning

l. Frame, and periodically revise, the rules, procedures and guidelines on all aspects of water management

m. Make social and environmental assessments mandatory in all plan development

Through its responsible agencies, the Government will:

n. Undertake comprehensive development and management of the main rivers through a system of barrages and other structural and non-structural measures

o. Develop water resources of the major rivers for multipurpose use, including irrigation,

p. fisheries, navigation, forestry, and aquatic wildlife

q. De-silt watercourses to maintain navigation channels and proper drainage

r. Delineate water-stress areas based on land characteristics and water availability from all sources for managing dry season demand

s. Take steps to protect the water quality and ensure efficiency of its use

t. Develop early warning and flood-proofing systems to manage natural disasters like flood and drought

u. Designate flood risk zones and take appropriate measures to provide desired levels of protection for life, property, vital infrastructure, agriculture and wetlands. In this regard the following principles will guide future action:

   i. Regions of economic importance such as metropolitan areas, sea and air ports, and export processing zones will be fully protected against floods as a matter of first priority. Other critical areas such as district and upazila towns, important commercial centers, and places of historical importance will be gradually provided reasonable degree of protection against flood. In the remaining rural areas, with the exception of those already covered by existing flood control infrastructure, the people will be motivated to develop different flood proofing measures such as raising of platform for homesteads, market places, educational institutions, community centers, etc., and adjusting the cropping pattern to suit the flood regime.

   ii. In future all national and regional highways, railway tracks, and public buildings and facilities will be constructed above the highest ever-recorded level of flood in the country. This principle will also apply in cases of reconstruction of existing structures of this nature.

   iii. All plans for roads and railways embankment will adequately provide for unimpeded drainage.

   iv. Undertake survey and investigation of the problem of riverbank erosion and develop and implement master plans for river training and erosion control works for preservation of scarce land and prevention of landlessness and pauperisation.

   v. Plan and implement schemes for reclamation of land from the sea and rivers.

4.3 Water Rights and Allocation

The ownership of water does not vest in an individual but in the state. The Government reserves the right to allocate water to ensure equitable distribution, efficient development and use, and to address poverty. The Government can redirect its use during periods of droughts, floods, cyclones, and other natural and man-made disasters, such as contamination of groundwater aquifers that threaten public health and the ecological integrity. Allocation rules will be the formal mechanism for deciding who gets water, for what purpose(s), how much, at what time, for how long, and under what circumstances water use may be curtailed. Rules for water allocation will be developed for in-stream needs (ecological, water quality, salinity control, fisheries and navigation) during low-flow periods; for off-stream withdrawal (irrigation, municipal and industrial, power), and for groundwater recharge and abstraction.

Allocation for non-consumptive use (e.g. navigation) would imply ensuring minimum levels in water bodies used for that purpose.

Henceforth, the policy of the Government to regulate the use of water, where required, will be exercised in the following manner:

a. The Government will exercise its water allocation power in identified scarcity zones on the basis of specified priorities.

b. In general, the priority for allocating water during critical periods in the water shortage

c. zones will be in the following order: domestic and municipal uses, non-consumptive uses (e.g. navigation, fisheries and wild-life), sustenance of the river regime, and other consumptive and non-consumptive uses such as irrigation, industry, environment, salinity management, and recreation. The above order of priority could however be changed on specific socio-economic criteria of an area by local bodies through local consensus.

d. For sustaining rechargeable shallow groundwater aquifers, the Government will regulate the extraction of water in the identified scarcity zones with full public knowledge.

e. Specific drought monitoring and contingency plans will be prepared for each region experiencing recurrent seasonal shortages of water with due consideration to conjunctive use of rainwater, surface water and ground water and alternative ways of satisfying demand. The contingency plan will include action to limit the use of groundwater according to priorities. Appropriate provisions of law should be made to protect specific users' rights in these extreme cases.

f. The Government may empower the local government or any local body it deems fit, to exercise its right to allocate water in scarcity zones during periods of severe drought, and it will monitor the water regime and enforcement of the regulations through specifically designed mechanisms.

g. The Government may confer water rights on private and community bodies to provide secure, defensible and enforceable ownership/usufructuary rights to ground water and surface water for attracting private investment.

h. In specifying surface water rights, the minimum requirement of stream-flow for maintaining the conveyance channel will be ensured.

4.4 Public and Private Involvement

Water resources management requires involvement of the public and private sectors, communities and individuals that benefit from the delivery of water-related services. The ultimate success and effectiveness of public water resources management projects depends on the people's acceptance and ownership of each project. It is important to delineate the roles and responsibilities of every one involved in water resources management. The principle that community resources should be managed by the community concerned, alongwith local government institutions unless a greater national interest prevails, should guide water resource management. It is recognised that women have a particular stake in water management because they are the principal providers and carriers of water, main caretaker of the family's health, and participants in many stages of pre and post harvest activities. The policies of the Government regarding the respective roles of the public and private sectors are:

a. Governmentís investments in water programme will be directed towards creation of public goods or for addressing specific problems of market failure and protecting particular community interests.

b. Policies and programmes of any public agency involving water resources will be coordinated with the policies and programmes of all other public and private bodies to build synergy and avoid conflict.

c. Public water institutions will, to the extent feasible, use private providers of specific water resources services in carrying out their mandates, giving preference to beneficiary groups and organisations.

d. The management of public water schemes, barring municipal schemes, with command area up to 5000 ha will be gradually made over to local and community organisations and their O&M will be financed through local resources.

e. Public water schemes, barring municipal schemes, with command area of over 5000 ha will be gradually placed under private management, through leasing, concession, or management contract under open competitive bidding procedures, or jointly managed by the project implementing agency alongwith local government and community organisations.

f. Ownership of FCD and FCDI projects with command area of 1000 ha or less will gradually be transferred to the local governments, beginning with the ones that are being satisfactorily managed and operated by the beneficiary/ community organisations.

g. Appropriate public and private institutions will provide information and training to the local community organisations for managing water resources efficiently.

h. Enabling environment will be created for women to play a key role in local community organisations for management of water resources.

i. Government, where appropriate, will restructure its present institutions and design all future institutions for efficient implementation of the above policies.

4.5 Public Water Investment

The Government considers that a consistent and uniformly applied analytical framework for project appraisal is essential to equitable, efficient and effective water resources management. A true multi-objective analysis of the water needs of an area, and the formulation of options for investment and management must consider the interrelations among different sources of water, different management schemes and the interaction between needs of different users and purposes. Investments in infrastructure may displace people and disturb ecosystems and, as such, broader water resources planning assessments and specific project appraisals must consider these cross-sectoral implications.

The policy of the Government in this regard is to ensure that:

a. Water resource projects, as far as possible, are developed as multipurpose projects with an integrated multi-disciplinary approach from planning to implementation to monitoring.

b. Planning and feasibility studies of all projects will follow the Guidelines for Project

c. Assessment (GPA), the Guidelines for Peopleís Participation (GPP), the Guidelines for Environmental Impact Assessment (EIA), and all other instructions that may be issued from time to time by the Government.

d. All relevant analytical procedures and evaluation methods, such as mathematical modelling, physical modelling, cost-benefit analysis, risk analysis and multi-criteria decision making are routinely used as part of water resources planning and project appraisal.

e. Public water projects are designed with specific provision for future disinvestment, if and when feasible.

f. Interests of low-income water users, and that of women, are adequately protected in water resource management.

g. There is continuous updating and archiving of water resource data and basic information by relevant public sector agencies.

4.6 Water Supply and Sanitation

The rural areas of Bangladesh suffer from lack of quality drinking water. Surface water supplies are generally polluted and groundwater, which till now had been the best source of safe drinking water, is contaminated with arsenic in many parts of the country. Heavy withdrawals of groundwater for irrigation have also lowered the water table in many areas below the effective reach of hand tubewells. Seepage of agro chemicals into shallow aquifers may also pollute water for human and animal consumption. Salinity intrusions from seawater deep into the land in the southwest are rendering groundwater unfit for consumption. Cities and urban areas too are facing the problem of receding water table due to heavy groundwater extraction. These water supply and sanitation problems have obvious implications for public health. Diarrheal diseases, arising largely from drinking unsafe water, are a leading cause of death in the rural areas. Lack of proper sanitation and drainage facilities, inadequate water supply, and insufficient health and hygiene education are the primary causes of diseases in the urban areas. Lack of access to safe water supply in the rural areas is a special hardship for women who have to carry water over long distances, with significant impact on their health and productivity.

To address these problems, it is the policy of the Government to:

a. Facilitate availability of safe and affordable drinking water supplies through various means, including rainwater harvesting and conservation.

b. Preserve natural depressions and water bodies in major urban areas for recharge of underground aquifers and rainwater management.

c. Mandate relevant public water and sewerage institutions to provide necessary drainage and sanitation, including treatment of domestic wastewater and sewage and replacement of open drains and construction of sewers, in the interest of public health.

d. Empower, and hold responsible, municipalities and urban water and sewerage institutions to regulate the use of water for preventing wastage and pollution by human action.

e. Mandate local governments to create awareness among the people in checking water pollution and wastage.

4.7 Water and Agriculture

Support of private development of groundwater irrigation for promoting agricultural growth will continue, alongside surface water development where feasible. But there will be a renewed focus towards increasing efficiency of water use in irrigation through various measures including drainage-water recycling, rotational irrigation, adoption of water conserving crop technology where feasible, and conjunctive use of groundwater and surface water.

Water allocations in irrigation systems have to be done with equity and social justice. At the same time, serious consideration should be given to non-point pollution of water systems by fertilizer and pesticides that are either leached to the groundwater or washed off the fields to rivers and lakes. For this purpose, the policy of the Government is to:

a. Encourage and promote continued development of minor irrigation, where feasible, without affecting drinking water supplies
b. Encourage future groundwater development for irrigation by both the public and the private sectors, subject to regulations that may be prescribed by Government from time to time.
c. Improve efficiency of resource utilisation through conjunctive use of all forms of surface water and groundwater for irrigation and urban water supply.
d. Strengthen crop diversification programmes for efficient water utilisation.
e. Strengthen the regulatory system for agricultural chemicals that pollute ground and surface water, and develop control mechanism for reducing non-point pollution from agro-chemicals.
f. Strengthen appropriate monitoring organisations for tracking groundwater recharge, surface and groundwater use, and changes in surface and groundwater quality.

4.8 Water and Industry

Excessive water salinity in the southwest region is a major deterrent to industrial growth. Also, pollution of both surface and groundwater around various industrial centers of the country by untreated effluent discharge into water bodies is a critical water management issue. The policy of the Government in this regard is that:

a. Zoning regulations will be established for location of new industries in consideration of fresh and safe water availability and effluent discharge possibilities.

b. Effluent disposal will be monitored by relevant Government agencies to prevent water pollution.

c. Standards of effluent disposal into common watercourses will be set by WARPO in consultation with DOE.

d. Industrial polluters will be required under law to pay for the cleanup of water- body polluted by them.

4.9 Water and Fisheries and Wildlife

Fisheries and wildlife are integral aspects of economic development in Bangladesh and strongly linked to advancement of target groups, poverty alleviation, nutrition, and employment generation. Availability of water for fisheries is thus important from the point of view of sustenance as well as commercial ventures. It is, therefore, the policy of the Government that:

a. Fisheries and wildlife will receive due emphasis in water resource planning in areas where their social impact is high.

b. Measures will be taken to minimise disruption to the natural aquatic environment in streams and water channels.

c. Drainage schemes, to the extent possible, will avoid state-owned swamps and marshes that have primary value for waterfowl or other wildlife.

d. Water bodies like baors, haors, beels, roadside borrow pits, etc. will, as far as possible, be reserved for fish production and development. Perennial links of these water bodies with the rivers will also be properly maintained.

e. Water development plans will not interrupt fish movement and will make adequate provisions in control structures for allowing fish migration and breeding.

f. Brackish aquaculture will be confined to specific zones designated by the Government for this purpose.

4.10 Water and Navigation

Inland navigation is of substantial economic importance to Bangladesh because its numerous watercourses provide the cheapest means of transportation. Siltation, however, has disrupted river communications in many water channels. De-siltation of these channels is required not only to restore their navigational capability but also to assist surface drainage. The policies of the Government in this regard are:

a. Water development projects should cause minimal disruption to navigation and, where necessary, adequate mitigation measures should be taken.

b. Minimum stream-flows in designated rivers and streams will be maintained for navigation after diversion of water for drinking and municipal purposes.

c. Dredging and other suitable measures would be undertaken, wherever needed, to maintain navigational capability of designated waterways.

4.11 Water for Hydropower and Recreation

Bangladesh has limited potential for hydropower due to its flat terrain and the absence of suitable reservoir area. However, it may be possible to build mini hydropower plants at small dam and barrage sites. A major environmental concern of hydropower development is the impediment to a river's natural flow imposed by structures built on it. A hydropower facility may be restrictive for fish movement also.

Use of water for recreational purposes is useful for developing tourism facilities. Introducing these facilities at the sites of reservoirs, lakes, dighis (big ponds), sea resorts, etc. would help the tourism industry of the country. The policy of the Government is therefore that:

a. Mini-hydropower development schemes may be undertaken provided they are economically viable and environmentally safe.

b. Recreational activities at or around water bodies will be allowed provided it is not damaging to the environment.

4.12 Water for the Environment

Protection and preservation of the natural environment is essential for sustainable development. Given that most of the country's environmental resources are linked to water resources, 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 including wetlands, mangrove and other national forests, endangered species, and the water quality. Accordingly, water resource management actions will take care to avoid or minimise environmental damages.

Water quantity and water quality issues are uniquely linked. Poor water quality affects the availability of fresh water for different uses. Contamination of surface water bodies and groundwater aquifers by agricultural pollutants, industrial discharge, domestic pollution,

and non-point source urban runoff exacerbate water quality problems and endanger both natural ecosystem integrity and public health. Other environmental problems include: excessive soil erosion and sedimentation, waterlogging and salinisation of agricultural land, groundwater depletion, watershed degradation and deforestation, reduction of biodiversity, wetland loss, saltwater intrusion, and coastal zone habitat loss.

Henceforth, all agencies and departments entrusted with water resource management responsibilities (regulation, planning, construction, operation, and maintenance) will have to enhance environmental amenities and ensure that environmental resources are protected and restored in executing their tasks. Environmental needs and objectives will be treated equally with the resources management needs. It is, therefore, the policy of the government that all water management agencies and related natural resources departments will:

a. Give full consideration to environmental protection, restoration and enhancement measures consistent with the National Environmental Management Action Plan (NEMAP) and the National Water Management Plan (NWMP).

b. Adhere to a formal environmental impact assessment (EIA) process, as set out in EIA

c. guidelines and manuals for water sector projects, in each water resources development project or rehabilitation programme of size and scope specified by the Government from time to time.

d. Ensure adequate upland flow in water channels to preserve the coastal estuary eco-system threatened by intrusion of salinity from the sea.

e. Protect against degradation and resuscitate natural water-bodies such as lakes, ponds, beels, khals, tanks, etc. affected by man-made interventions or other causes.

f. Completely stop the filling of publicly-owned water bodies and depressions in urban areas for preservation of the natural aquifers and environment.

g. Take necessary steps to remove all existing unauthorised encroachments on rivers and watercourses and to check further encroachments that cause obstructions to water flows and create environmental hazards.

h. Stop unplanned construction on riverbanks and indiscriminate clearance of vegetation on newly accreted land.

i. Encourage massive afforestation and tree coverage specifically in areas with declining water table.

j. Enforce the "polluter pay" principle in the development of regulatory guidelines for all regulatory actions designed to protect public health and the environment.

k. Provide education and information to the industrial and farming communities on selfadministered pollution control mechanisms and their individual and collective responsibilities for maintaining clean water sources.

4.13 Water for Preservation of Haors, Baors, and Beels

Water bodies like haors, baors, and beels are precious assets of Bangladesh with unique regional characteristics. Apart from their scenic beauty, they have great economical and environmental value. Even during extremely dry seasons, when the smaller beels turn into quagmires, the haors and the baors retain considerable amount of water. These water bodies account for a large share of the natural capture fisheries and provide a habitat for a wide variety of aquatic vegetation and birds. They also provide sanctuary to migratory birds during winter. The haors and the beels usually connect to some adjoining river through khals. In the past, many beels have been drained through engineering interventions and turned into cropland for immediate gains. The adverse effects of such interventions have been deleterious to the environment. They have destroyed the fish and aquatic vegetables that thrive in these wetlands and are important in the diet of the rural poor. They have also blocked the flow of wastes, discharged from the flood plains and domestic sources, which naturally move out of the beels through the khals into the river's drainage system. Only submersible dikes have provided tangible benefits in certain haor areas by enabling cultivation of high yielding variety boro rice.

The Government believes that in order to assist the natural processes of groundwater recharge, maintenance of aquatic life and ecological balance, disposal of wastes through the dynamic river system, and for turning the huge water bodies into recreational areas, their planned development is essential.

It is, therefore, the policy of the Government that:

a. Natural water bodies such as beels, haors, and baors will be preserved for maintaining the aquatic environment and facilitating drainage.

b. Only those water related projects will be taken up for execution that will not interfere with the aquatic characteristics of those water bodies.

c. Haors that naturally dry up during the winter will be developed for dry season agriculture.

d. Take up integrated projects in those water bodies for increasing fish production.

e. Natural water bodies will be developed, where possible, for recreational use in support of tourism.

4.14 Economic and Financial Management

Changes are required in the system of prices and other economic incentives affecting water demand and supply in Bangladesh. Unless the users pay a price for water, there will be a tendency to misuse and deplete it under scarcity conditions. Desirable practices such as conjunctive use, water-saving agricultural and industrial technologies, water harvesting, water transfers, and water recycling, both within and between sectors, will emerge only when users perceive the scarcity value of water.

A system of cost recovery, pricing, and economic incentives/disincentives is necessary tobalance the supply and demand of water. Cost recovery of services such as flood control, drainage, irrigation, and wastewater treatment has not been considered adequately. Failure to recover O & M cost leads to decline of service quality and deterioration of the system. This, in turn, makes the consumers less willing to pay for the deteriorating services. An important principle, for the long-term, in this regard is that public service agencies should be converted into financially autonomous entities, with effective authority to charge and collect fees. The participation of users in managing and maintaining water facilities and operations is an important element of financial accountability. It is, therefore, the policy of the Government that:

a. Water will be considered an economic resource and priced to convey its scarcity value to all users and provide motivation for its conservation. For the foreseeable future, however, cost recovery for flood control and drainage (FCD) projects is not envisaged in this policy. In case of flood control, drainage, and irrigation (FCDI) projects water rates will be charged for O&M as per Government rules.

b. Relevant public water supply agencies will be gradually given authority to charge for their services.

c. Recovery of O&M cost will, as far as possible, be made through private collection means such as leasing and other financial options. Beneficiaries and other target groups will be given preference for such contracts.

d. The pricing structure will match the goals and needs of the water provider and the population served. Water rates will be lower for basic consumption, increasing with commercial and industrial use. The rates for surface and groundwater will reflect, to the extent possible, their actual cost of delivery.

e. Water charges realised from beneficiaries for O&M in a project would be retained locally for the provision of services within that project.

f. Effective beneficiary participation and commitment to pay for O&M will be realised at the project identification and planning stages by respective public agencies.

g. Appropriate financial incentives will be introduced for water re-use and conservation, responsible use of groundwater, and for preventing overexploitation and pollution.

4.15 Research and Information Management

Informing policy makers of the choice of appropriate technology to meet policy goals andmake them aware of their significance and impact is an essential requirement of a dynamic water management policy. It is important to reach a common understanding between specialists, planners, politicians and the general public about the changing environment and the optimal ways and means of achieving the national water management goals. As management decisions become increasingly complex and information-sensitive, the demand for supporting research and information management increases.

It is the policy of the Government in this regard to:

a. Develop a central database and management information system (MIS) consolidating information from various data collection and research agencies on the existing hydrological systems, supply and use of national water resources, water quality, and the eco-system. b. Restructure and strengthen, where appropriate, water resource and agriculture research institutions to undertake systematic research and analysis of water and land management issues and problems arising both nationally and internationally.

b. Investigate thoroughly important flood control and management issues, such as the efficacy of coastal polders, for guiding future policy on structural interventions.

c. Investigate important sociological issues, such as the phenomenon of interference with water structures (e.g. public cuts), and the motives and conflicting interests behind them, to assist the process of building public support and acceptance of government water management programmes.

d. Strengthen and promote the involvement of public and private research organizations and universities to:
    i. Develop and disseminate appropriate technologies for conjunctive use of rainwater, ground water and surface water.
    ii. Develop and promote water management techniques to prevent wastage and generate efficiency of water and energy use.
    iii. Produce skilled professionals for water management.

4.16 Stakeholder Participation

Decisions regarding water resources management can affect nearly every sector of the economy and the public as a whole, and stakeholder participation should be established in a form that elicits direct input from people at all levels of engagement. Stakeholder involvement should be an integral part of water resources management, at all stages of the project cycle. Towards that objective there should be a complete reorientation of the institutions for increasing the role of stakeholders and the civil society in decision making and implementation of water projects. The Government has to be at the core of the effort to help build the local institutions and to impart a precise awareness of the issues and an unambiguous understanding of their role in water management. Similarly, Government must lead the effort to ensure greater participation of women in this endeavour.

In order to ensure that all stakeholders actively and fruitfully participate in water resources management decision making at all stages, it is the policy of the Government that:

a. The "Guidelines for People's Participation (GPP) in Water Development Projects" be adhered to as part of project planning by all institutions and agencies involved in public sector management of water resources.
b. Guidelines for formation of water user groups (WUG) and similar community organisations will be formulated.
c. Generally 25 percent of the earthwork of any public water project will be offered to specific target groups or beneficiaries.
d. All opportunities are explored and efforts undertaken to ensure that the landless and other disadvantaged group are directly involved in participatory management of local water resources.
e. New projects proposed by a community or local institution will be considered for implementation on a priority basis only when the beneficiaries have mobilised a certain percentage of the total cost as their contribution to the project.

5. Institutional Policy

The governance and management of the national water resources require a great deal of coordination of existing institutions and in some cases reform and creation of new communitybased institutions. Water resources management extends across many water using sectors as well as political jurisdictions and geographically and hydrologically diverse areas. Properly functioning institutions are essential for effective implementation and administration of the country water and related environmental resource management policies and directives.

The Government will restructure and strengthen, where appropriate, the existing institutions to ensure that the agenda for reform and the action plan is implemented efficiently. Two important principles will govern institutional restructuring. Firstly, there should be separation of policy, planning, and regulatory functions from implementation and operational functions at each level of government. Secondly, each institution must be held accountable for financial and operational performance.

It is the policy of the Government that:

a. The Government will formulate a framework for institutional reforms to guide all water sector related activities. It will periodically review the mandates of all water sector institutions and redefine their respective roles, as necessary, to ensure efficient and effective institutions commensurate with changing needs and priorities.

b. The National Water Resources Council (NWRC) will coordinate all water resources management activities in the country, and particularly:

   i. Formulate policy on different aspects of water resource management.

   ii. Provide directions for optimal development and utilisation of the national water resources.

   iii. Oversee the preparation and implementation of the National Water Management Plan.

   iv. Provide directions on the development of efficient institutions for managing the water resources.

   v. Provide policy directives for appropriate coordination among different water sector agencies.

   vi. Look after any other water resource management matter that may require its attention.

c. The Executive Committee of the National Water Resources Council (ECNWRC) will have the following responsibilities:

   i. It will provide directives on all matters relating to the planning, management, and coordination of water resources across all sectors, as may be required by the NWRC.

   ii. It will guide water management institutions at the national, regional, and local levels in the formulation and implementation of policies and plans for improved water management and investment.

   iii. It will apprise and advise the National Water Resources Council periodically on matters of water resource management.

   iv. iv. It will undertake any other function, as may be required from time to time, by the NWRC.

d. WARPO will be the exclusive government institution for macro-level water resource planning. It will also serve as the Executive Secretariat of the ECNWRC with the following principal responsibilities:

   i. Providing administrative, technical, and legal support to the ECNWRC.

   ii. Advising the ECNWRC on policy, planning, and regulatory matters of water resources and related land and environmental management.

   iii. Preparing and periodically updating the National WaterManagement Plan for approval of the NWRC.

   iv. Setting up and updating the National Water Resources Database (NWRD) and Information Management System.

   v. Acting as a "clearing house" for all water sector projects identified by different agencies and reporting to the ECNWRC on their conformity to the NWMP.

   vi. Undertaking any special study, as may be required by the ECNWRC, for fulfilling the objectives and programmes envisaged in the National Water Policy and the Bangladesh

   vii. Water and Flood Management Strategy. Performing any other function as may be assigned to it from time to time by the Government.

e. The Government will lead the effort towards developing grassroot institutions, in conjunction with the civil society, for managing water resources at community levels.

f. Public water projects will include a training component for transfer of knowledge andtechnology to the users that will be monitored by the executing agency at every stage of the project work.

6. Legislative Framework

Setting the appropriate legislative framework is fundamental to effective implementation of the water policy. The existing legislation related to any form of water management in Bangladesh requires supplementing in a number of key areas. This policy will be given effect through a National Water Code encoding specific provisions of the water policy to facilitate its implementation.

The policy of the Government in this regard is:

a. To periodically review the provisions of the body of laws and regulations that have animpact on water resource management and to recommend changes and amendments in them for efficient coordination of the work of different water-related sub-sectors.

b. To enact a National Water Code revising and consolidating the laws governing ownership, development, appropriation, utilisation, conservation, and protection of water resources.

Playground, Open Place, Park and Natural Watershed Conservation Act, 2000

This Act was passed for conservation of playground, open place, park and watershed of all cities, divisional towns and all municipal areas including all district municipal areas of the country. The definitions of Park, Open Place, Playground, Natural Watershed, scheduled rules under this Act, Authorities for Rajdhani, Chittagong, Khulna and Rajshahi development, Master Plan, Class alternation of such Park *etc.*, is given in this Act.

Under the provisions of this Act, some restrictions impose on the use of such places as classified by the Act. These restrictions are the places which marks as playground, open place, park and Natural watershed shall not be changed its class, or altered, or shall not be used those places for alternative use, or shall not be rented, or leased out, or handed over by any other means.

The Environment Court Act, 2000

Act No. 11 of 2000

[Bangla text of the Act was published in the Bangladesh Gazette, extra-ordinary issue of 10-4-2000 and amended by Act No. 10 of 2002]

An Act to provide for the establishment of environment courts and matters incidental there to-

Where as it is expedient and necessary to provide for the establishment of Environment Courts for the trial of offences relating to environmental pollution and matters incidental thereto;

It is hereby enacted as follows:-

1. **Short title-** This Act may be called the Environment Court Act, 2000.

Definitions- In this Act, unless there is anything contrary to the subject or context-

"Civil Procedure Code" means the Code of Civil Procedure, 1908 (Act V of 1908);

"Criminal Procedure Code" means the Code of Criminal Procedure, 1898 (Act V of 1898);

"Director General" means the Director General of the Department of Environment;

"Environment Appeal Court" means an Environment Appeal Court constituted under this

"Environment Court" means an Environment Court constituted under this Act; **"environmental law"** means this Act, the Bangladesh Environment Conservation Act, 1995 (Act No. 1 of 1995), any other law specified by the Government in the official Gazette for the purposes of this Act, and the rules made under these laws;

"Inspector" means an Inspector of the Department of Environment or any other person authorized by the Director General by a general or special order or a person authorized under any other environmental law to inspect or investigate;

"Special Magistrate" means a Special Magistrate appointed under section

Overriding effect of the Act.- Notwithstanding anything contained to the contrary in any other law for the time being in force, the provisions of this Act shall have effect.

Establishment of Environment Courts.-

(1) For carrying out the purposes of this Act, the Government shall, by notification in the official Gazette, establish one or more Environment Court in each Division. An Environment Court shall be constituted with one judge and, in consultation with the Supreme Court, the Government shall-

(a) appoint an officer of the judicial service of the rank of Joint District Judge, and such Judge shall dispose of cases only under environmental laws; and (b) if it considers necessary, appoint a judge of the rank of Joint District Judge for a Division or a specified part thereof to act as the judge of an Environment Court in addition to his ordinary functions, and the said judge shall, in addition to his ordinary functions, dispose of the cases that fall within the jurisdiction of an Environment Court.

(3) Each Environment Court shall have its seat at the Divisional Headquarter; however, the Government, if it considers necessary, may, by general or specific order published in the official Gazette, specify places outside the Divisional Headquarter where the court can hold its sittings.

(4) If more than one Environment Court are established in any Division, the Government shall, by notification in the official Gazette, specify the territorial jurisdiction of each such Court.

5. **Jurisdiction of Environment Court.-**

(1) Notwithstanding anything contained to the contrary in any other law, a case shall, in accordance with the provisions of this Act, be directly instituted in an Environment Court for trial of an offence or for compensation under an environmental law, and only that court can take cognizance and hold proceedings for trial and disposal of those cases.

(2) An Environment Court shall be competent to impose penalty for offences under section 5A of this Act and under any other environmental law, to confiscate an equipment or part thereof, a transport used in the commission of such offence or an article or other thing involved with the offence, and to pass order or decree for compensation in appropriate cases; and in addition, the said court may in the same judgment make all or any of the following orders keeping in view of the circumstances of the offence or relevant facts:-

a. issuing a direction to the offender or other relevant person not to repeat or continue or, as the case may be, not to do the act or to make the omission which constitutes the offence;

b. issuing a direction to the offender or other relevant person to take such preventive or remedial measures in relation to the injury or probable injury to environment as the court

c. considers appropriate keeping in view of the circumstances of the offence or the relevant facts;

d. in case of a direction under clause (b), specifying a time limit and a further direction to submit within the specified time a report to the Director General or other appropriate authority on the implementation of the direction : Provided that where a direction under clause (b) or (c) is issued, the person directed may apply to the court within 15 days of the judgment for review of such direction and the court shall, after giving the Director General a reasonable opportunity of being heard, dispose of the application within 30 days after it is made.

(3) No Environment Court shall take cognizance of an offence or receive any suit for compensation except on the written report of an Inspector or any other person authorized by the Director General:

Provided that if the Environment Court is satisfied that a person presented a written request to the said Inspector or authorized person to accept a complaint about an offence or a claim for compensation and no action was taken within 60 (sixty) days after such request, and that such complain or claim deserves to be taken into cognizance for the purpose of trial, then the court may, after giving the Inspector or the authorized person or the Director General a reasonable opportunity of being heard, directly receive the complaint or claim for compensation without. such written report, or may, if it considers appropriate, direct the said Inspector or the authorized person to investigate the offence or claim.

5A. **Penalty for violating court's order.-** If a person - (a) violates a direction issued under clause (a) of section 5(2) by repeating or continuing the offence for the commission of which he has been sentenced, he shall be liable to be sentenced with the penalty prescribed for that offence, provided such penalty shall not be less than the one imposed on him at the time of issuance of the direction;

(b) violates a direction issued under clause (b) or (c) of section 5(2), the violation shall be an independent offence for which he shall be liable to be sentenced to an imprisonment not exceeding 3 (three) years or to a fine not exceeding 3 (three) lac taka or to both.

Explanation.- The other provisions of this Act shall apply to the investigation and trial of an offence under this section.

5B. **Trial of certain offences by Special Magistrates.-** Where an environmental law provides for a penalty of an imprisonment not exceeding 2 (two) years or a fine not exceeding 10 (ten) thousand taka or both or confiscation of anything, for the commission of an offence, a Magistrate of the first class or a Metropolitan Magistrate who is appointed to deal only with such cases arising in a specified area or who is assigned to deal with such cases in addition to his ordinary duties, as the Government may specify, shall be competent to try the offences; such Magistrates shall be known as Special Magistrates:

Provided that if such offence is combined with another offence under an environmental law and if both the offences require trial in the same proceedings, then the offences shall be triable in the Environment Court.

5C. **Trial procedure in Special Magistrate's Court.-**

1) No Special Magistrate shall take cognizance of an offence except on a written report of an Inspector :
2) Provided that, if authorized by the Director General in relation to the institution of a particular kind of case triable by such Magistrate, an Inspector may present a report on such offence directly to the Magistrate without following the procedure prescribed in section 7.
3) A Special Magistrate appointed under this Act shall follow the procedure for summary trial as prescribed in the Criminal Procedure Code.

4) A case triable by the court of a Special Magistrate shall be conducted by an Assistant Public Prosecutor or a police officer specified by the Government or an Inspector of the Department of Environment on behalf of the State.

6. **Power of entry, search, etc.-**

1) For the purposes of conducting an inspection of any matter or investigation of an offence under an environmental law, or when directed by the Director General or the Environment Court for assessing compensation under this Act, an Inspector may, at any reasonable time, enter any place, search into, or seize any thing or collect sample from, or inspect, that place.

2) For the purposes of sub-section (1), an Inspector may, whenever he considers necessary, apply to the Environment Court or to any Magistrate for issuance of a search warrant.

3) An Inspector shall, as far as practicable, follow the Criminal Procedure Code and the relevant provisions of the environmental law in conducting a search, seizure or inspection under this section.

7. **Procedure for investigation.-**

1) An offence under an environmental law shall ordinarily be investigated by an Inspector, but the Director General may, by a general or special order, authorize any other officer subordinate to him to investigate any particular kind of offences or a specified offence.

2) The said Inspector or other officer, hereinafter referred to as the investigating officer, shall on the basis of a written complaint or other information, initiate proceedings under this section after obtaining approval of the officer authorized in this behalf by the Director General.

3) The investigating officer shall, before initiating a formal investigation of an offence, inquire into and collect information about the offence, prepare a preliminary report thereon and present it to a higher officer authorized by the Director General in this behalf, and the officer secondly mentioned shall, upon consideration of the relevant facts and circumstances, give his decision within (seven) days as to whether a formal investigation may be initiated or whether no action at all is necessary, and accordingly next actions shall be taken.

4) If a decision is taken to initiate a formal investigation under subsection (3), the investigating officer shall present the said preliminary report to the concerned police station, and it shall be recorded in the police station as a first information

report or ejahar of the offence and thereafter the said investigating officer or, as the case may be, another officer authorized by the Director General shall conduct the investigation.

5) The investigating officer while investigating an offence shall, in relation to that offence, be competent to exercise the same powers as an officer in charge of a police station and he shall, subject to this Act and the rules, follow the Criminal Procedure Code.

6) Any statement recorded, any article seized, any sample or other information collected at the inquiry stage held before formal investigation may be considered and used for the purpose of investigation.

7) The investigating officer shall, after completion of the investigation, obtain the approval of an officer **1**authorized by the Director General in this behalf and submit one copy of the investigation report and the original or attested copies of the supporting documents directly to the environment court or as the case may be to a Special Magistrate if the case is triable by such Magistrate, and shall also keep one copy at his office and present another copy to the police station; and such report shall be deemed to be a police report under section 173 of Criminal Procedure Code.

8) Notwithstanding the provisions of sub-section (3), where the investigating officer has reasons to believe that any document, article or equipment involved with an offence is likely to be removed or destroyed, he may, even before a decision for formal investigation, seize the document, article or equipment, and if the investigator has reasons to believe that the offender is likely to abscond, he may also arrest the offender.

7A. **Assistance from law enforcing agencies and other authorities.-** For the purposes of sections 6 and 7, the investigating officer may request any law enforcing agency or other authority for assistance and the requested agency or authority shall accordingly render assistance.

8. **Procedure and power of Environment Court.-**

1) Unless otherwise provided in this Act, provisions of the Criminal Procedure Code shall be applicable in the case of lodging a compliant about an offence under this Act, trial thereof and the Environment Court shall be deemed to be a criminal court and it shall follow the procedure laid down in the Criminal Procedure Code for trial and disposal of a case triable by the Sessions Court.

2) The Environment Court shall be competent to order the investigating officer or other person investigating to hold further investigation of the offence in relation to which a case is pending before it and also to specify the timelimit for submission of the report of such further investigation.

3) The Environment Court shall be competent to exercise any power conferred on it by this Act or any other environmental law.

4) A case triable by an Environment Court shall be conducted by a Public Prosecutor or an Additional or Assistant Public Prosecutor on behalf of the State:

5) Provided that an Inspector or an officer authorized by the Director General may assist the said prosecutor in conducting the case and if necessary may make his submission before the court.

6) Subject to provisions of this Act, the Civil Procedure Code shall be applicable to the trial and disposal of a case relating to compensation; and the Environment Court, for the purpose of trial and disposal of a suit for compensation, be deemed to be a civil court and shall be competent to exercise all the powers of a civil court.

7) Hearing of a case at the trial stage shall not be adjourned more than three times and the Environment Court shall conclude the trial within one hundred eighty days:

8) Provided that where the trial is not completed within the above time-limit, the Environment Court shall, within 15 days after expiry of that period, inform the Environment Appeal Court of the delay and the reasons for such delay, and shall complete the trial of the case within ninety days after the expiry of the above mentioned one hundred eighty days.

9. **Conversion of fines to compensation.-**

1) Notwithstanding anything contained to the contrary in any other law for the time being in force, the Environment Court may, if it considers necessary, convert fines imposed by it as compensation to be paid to persons affected as a result of the commission of an offence under an environmental law; and the fine or compensation shall be realizable from the person who has been sentenced with the fine.

2) If a claim for compensation is related to an offence under an environmental law in such a manner that the trial of the offence and the claim should be held in the same proceedings, then the Environment Court shall try the offence first and, if the compensation to be awarded is not commensurate with the fine imposed as a penalty of the offence, then the application for compensation can be considered separately.

10. **Authority of Environment Court to inspect.-**

1. If, at any stage of the trial of a case, any question arises relating to any property, object or place of occurrence of an offence the Environment Court can inspect the property, object or the place of occurrence, after serving notice on the parties or their lawyers as to the place and time of inspection.
2. During inspection or immediately thereafter, the Judge shall record the results of the inspection in the form of a memorandum and such memorandum shall be evidence in the trial of the case and such evidence shall not be called in question by any party.

11. **Appeal.-**

1) Notwithstanding anything contained to the contrary in the Civil Procedure Code or the Criminal Procedure Code, no question shall, except in accordance with the provisions of this Act, be raised before any court or other authority on the proceedings, order or decision of, or a decree of compensation passed and penalty imposed by, the Environment Court.
2) A party aggrieved by a Judgment or a decree of compensation passed or a penalty imposed by the Environment Court can file an appeal to the Environment Appeal Court established under section 12 within thirty days of the date of passing the judgment, decree of compensation or penalty, or order of dismissal of a civil suit or an order specified in sub-section (3).
3) An appeal shall lie to the Environment Appeal Court against an order of interim or temporary injunction, an order to maintain status quo, an order granting or refusing bail, an order of framing charge or discharge, and an order of taking cognizance of an offence or refusal thereof passed by an Environment Court; no other interim order shall be appealable nor shall the legality or propriety thereof shall be called in question before the Environment Appeal Court or any other court.

(3A) An appeal shall lie to the Environment Appeal Court against an order of conviction and sentence or acquittal, an order granting or refusing bail, an order of framing charge or discharge, and an order of taking cognizance of an offence or refusal thereof, passed by a Special Magistrate Court; no other interim order passed by such Magistrate shall be appealable nor shall the legality or propriety thereof shall be called in question before the Environment Appeal Court or any other court.

(4) Notwithstanding the provisions of sub-section (1), a party aggrieved by a judgment or decree passed by an Environment Court in a suit for compensation shall not be entitled to file an the appeal against the said judgment or decree without depositing half of the decreed amount with the court which passed the decree.

12. **Environment Appeal Court.-** (1) For carrying out the purposes of this Act, the Government shall, by notification in the Official Gazette, establish one or more than one Environment Appeal Court.

(2) An Environment Appeal Court shall be constituted with one judge and, in consultation with the Supreme Court, the Government shall-

a. appoint an officer of the judicial service of the rank of District Judge and such Judge shall dispose of cases only under environmental law; and

b. if it considers necessary, for a specified area appoint a District and Sessions Judge of a district to act as the judge of an Environment Appeal Court in addition to his ordinary duties, and such a judge shall, in addition to his ordinary duties, dispose of the cases that fall within jurisdiction of an Environmental Appeal Court.

(3) The seat of the Environment Appeal Court shall be in Dhaka or any other place specified by the Government.

(4) For the purpose of disposal of appeals relating to offences, the Environment Appeal Court may exercise all the powers of a Sessions Court as an Appeal Court under the Criminal Procedure Code.

(5) For the purpose of disposal of an appeal relating to a suit for compensation, the Environment Appeal Court may exercise all the powers of an appellate court under the Civil Procedure Code.

2A. **Transfer of cases.-** An Environment Appeal Court may, on an application or other information-

(a) transfer a pending case from one Environment Court to another such court subordinate to it or to retransfer a case;

(b) transfer a pending case form the court of a Special Magistrate to that of another Special Magistrate or to an Environment Court subordinate to it, or retransfer such a case.

13. **Pending cases.-** A case under an environmental law pending in any court immediately before the commencement of this Act, shall be so continued and disposed of in that court as if this Act has not been enacted.

3[13A. **Jurisdiction of Environment Court over offences etc. committed**

earlier.- (1) If a case has not been instituted against an offence committed before the commencement of the Environment Court (Amendment) Act, 2002, the offence can be taken cognizance of by an Environment Court or by a Special Magistrate, as the case may be, on the basis of a written complaint or report of an Inspector or any other person authorized in this behalf by the Director General , and the case can be disposed of according to this Act.

(2) For the purposes of this section, a case instituted on complaint shall not be dismissed under section 247 of the Criminal Procedure Code only on the ground of absence of the complainant.

14. **Power to make rules.-** For carrying out the purposes of this Act, the Government may, by notification in the Official Gazette, make rules.

The Bangladesh Environment Conservation (Amendment) Act, 2010

The Bangladesh Environment Conservation (Amendment) Act was passed on 5th October 2010 for conservation, development of the environmental quality and standard, and for controlling and mitigating environment pollution in Bangladesh. The Government passes the 'Environment Conservation Rules for the implementation of Bangladesh Environment Conservation Act. The Bangladesh Environment Conservation (Amendment) Act, 2010 has been passed with a view to ensuring the empowerment of the government to take any express decisions for saving the environment, to declare any area 'Ecologically Critical', to suit against the violators of the environmental laws. A set of instruction is found in this act related to environment. For executing the environmental laws the punishment has been increased in this act.

Animal Slaughter (Restriction) and Meat (Control) Act, 2011

The House August 25, 2011 passed a bill aimed to control the spread of contagious diseases including anthrax through ensuring animal fitness before slaughtering and controlling meat quality. The new law, Animal Slaughter (Restriction) and Meat (Control) Act, 2011, has provision for punishment with jail term up to maximum one year and fine up to maximum Tk 25,000 or both for violation of the law. The cabinet approved the draft bill of the law in 2010, which was aimed at replacing the Animal Slaughter

(Restriction) and Meat (Control) Act, 1957. The new law has provision to punish those responsible for slaughtering sick animals and marketing of unhygienic meats and meat products, whereas the previous law lacked directives on the same. Besides, hens, ducks and some other animals and birds were not incorporated in the previous law. In the current bill, there are provisions to issue license for operating meat selling centers and meat processing industries. The government will also create a legal structure on export of meat and meat products, the draft law said. Health experts in collaboration with the administration will ensure testing of animals and its meats before these go to the markets. Besides, the persons working in animal slaughtering centers, meat marketing centers and meat products industries will go through regular medical checkup, said the bill.

The Bangladesh Bio-Safety Rules, 2012

The Bangladesh Bio-Safety Rules was passed on 29th August 2012 for conservation, development of the environmental quality and standard, and for controlling and mitigating environment pollution in Bangladesh. The Government passes the 'Environment Conservation Rules for the implementation of Bangladesh Environment Conservation Act. The Bangladesh Bio-Safety Rules, 2012 has been passed with a view to providing definition of the key terms and proper guidelines related to environmental issues, ensuring administrative punishment for the violation of the environmental rules, co-operating with other organizations and agencies for rapid solution, taking projection and preparation to overcome critical situation.

Wildlife (Conservation) Bill, 2012

The Jatiya Sangsad July 8 passed the Wildlife (Conservation) Bill, 2012 in an amended form aimed at protecting the endangered animals as well as plant lives in the country. Environment and Forests Minister piloted the bill in the House that was later passed in voice votes. In his statement attached with the bill, the minister said the very existence of a number of animals are now under severe threat as no adequate measurers were taken to protect wildlife in the pre-independence period. He said eight kinds of amphibians, 58 reptiles, 41 different kinds of birds and 40 species of mammals were identified by International Union for Conservation of Nature (IUCN) as endangered.

The minister informed the House that the government in 1973 framed a law for conservation of the forests. But, since independence no effective measure was taken for conservation of the wildlife. Environment and Forest Minister said Bangladesh as a

signatory to CITES (Convention on International Trade of Endangered Species), CBD (Convention on Biological Diversity), CMS (Convention on Migratory Species of Wild Animals) and Ramsar Convention, needs to update its own laws coherent with the international laws. The bill with many other provisions proposed stern action for violation of the law. It proposed one-year imprisonment and Taka 50,000 fine for such a violation. The law also proposed at least two years and highest seven years imprisonment and minimum Taka one lakh and maximum Taka 10 lakh fine for killing a tiger or elephant.

Ecologically Critical Area Management Rules, 2012

There are more than seventeen area declared as ecologically critical through the country. This rule has been passed in 2012 with a view to ensuring safety of biological diversity, controlling ecosystem, and implementing the relative laws.

Development-Trends of Environment Laws

This graph represents the Development-Trends of Environment Laws Prevailing in Bangladesh (Figure 3.1).

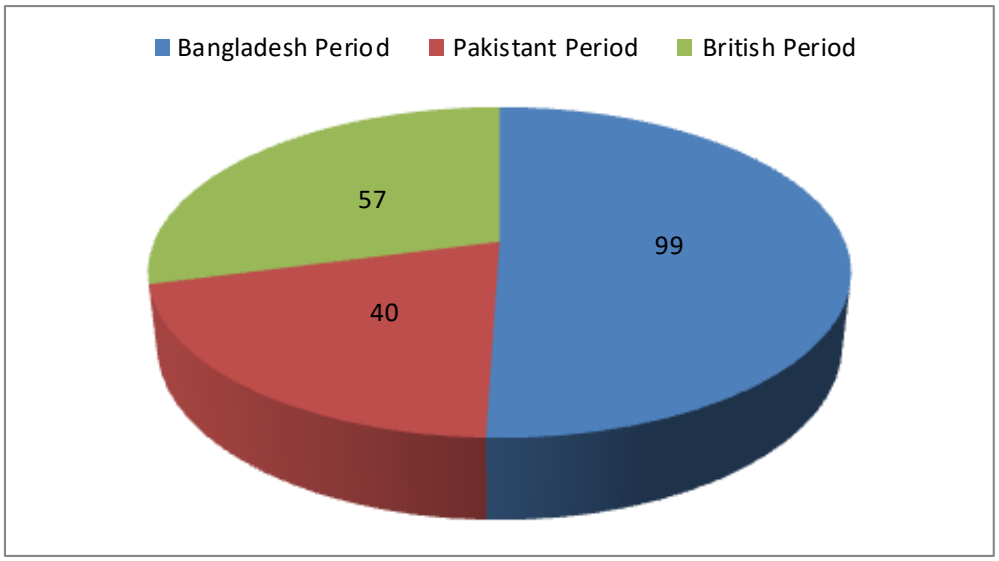


Figure 3.1
Developmental Trends of Environment Laws in Bangladesh

3.3 State of Environmental Law in Bangladesh

The majority of environmental laws in Bangladesh were passed under substantially different population and development conditions. For example, the Factories Act of 1965 and some other health protection laws were designed before industrial pollution and hazardous substances became serious concerns.

The Environment policy of 1992 of Bangladesh has recognized the need for a better and comprehensive approach to address environmental issues. It requires specific actions in the development sectors of the country to facilitate long-term sustainable use of all natural resources. In the industry sector, it provides for EIA for new industries, corrective measures for polluting industries, a ban on establishment of polluting industries and development of environmentally sound and appropriate technology for sustainable and efficient utilization of natural resources.

Very few of the elements of the environmental Policy, however, have yet been translated into laws. The only legislation which specifically deals with environmental issues is the Bangladesh Environmental Conservation Act (ECA), 1995. The Act was passed to provide for conservation and improvement of environmental standards and for controlling and mitigating environmental pollution. It, however, provides very few substantive obligations relating to environmental management of industries.

Among Bangladeshi sectoral laws, environmental issues are seldom referred to and when they are they bear no real substance. For example, Article 6 of the Bangladesh Petroleum Act, 1974 provides that it shall be the duty of any person engaged in any petroleum operation to ensure than the operation is carried out (i) in proper and workmanlike manner and in accordance with good oil-field practice, (ii) in a manner that does not interfere with navigation, fishing, and conservation of resources of the sea and sea-bed and to consider factors connected with the ecology and environment. The Act has not defined what the factors 'connected with the ecology and environment' are and what management elements a company should establish and maintain to discharge its obligations under Article 6.

3.4 Development of Environmental Laws on Biodiversity in Bangladesh

Bangladesh, as high dense populated country, is suffering from various environmental problems such as pollution, land degradation, deforestation, biodiversity degradation, depletion of environmental resources, wetland degradation, urban solid waste management, *etc.* The government of Bangladesh has enacted different laws in different period for conserving and developing the environments. There are around 200 different Acts and Ordinance in Bangladesh for environmental concerns. However, it is remarkable

that some Acts and Ordinance has taken covering different sectors of environmental problems and its mitigating policies. Among them, Environment Policy 1992, Environmental Action Plan 1992, Bangladesh Environment Conservation Act, 1995, Bangladesh Environment Conservation Rules- 1997, Environment Court Act, 2000 are the most noteworthy because it is first of its kind in Bangladesh covering all sectors of environmental problems as well as action plan and policy for mitigating environmental problems in Bangladesh. Recently Govt. of Bangladesh passed two act & two rules in this field such as Environment conservation (amendments) Acts 2010, Biodiversity Act-2012 Bio-Safety Rules 2012, Ecologically Critical Area Management Rules 2012. In this section, sectoral legal mechanism for dealing with and managing the environmental problems is discussed

3.4.1 Development of Agricultural Law (Figure 3.2)

Bangladesh is an agro-based country and predominantly is an agrarian economy (MS Mian, Economics and agricultural development-Bangladesh perspective). Agriculture is one of the most important and largest sectors in the national economy. Agriculture has been playing a crucial role in socio-economic progress and sustainable development through upliftment of rural economy (GOB, Bangladesh Economic Review, 2003&2004, Ministry of finance). About 85 percent people engaged in this sector for their livelihood. The agriculture has long been associated with the development of civilization and the agricultural production in Bangladesh, which has been practiced for thousands of year and supported major civilizations (Saleemul Huq and A Atiq Rahman (eds.), Environmental Aspects of Agricultural Development in Bangladesh (Dhaka: The University Press Limited, 1990). The agricultural research began during the British era in 1880 with the establishment of the Department of Agriculture. The research on three crops such as rice, jute and tea began in 1908, but the progress was very slow. After the independence of Bangladesh, in 1971, a few attempts are drawn to advance agricultural research in the country but it is insignificant in comparison to international standards agricultural research.

In Bangladesh around 24 agricultural Acts is implemented for the conservation and development of the agriculture in Bangladesh. Most of these laws are of British era. Some are of Pakistan period and a few passed after the independence of Bangladesh. The

prevailing agricultural laws of Bangladesh are divided under three heads such as Agriculture and Irrigation, Pest and Quality Control and Agricultural Research Institute.

There are about ten Acts relating to agriculture in the British period and around nine acts passed in the Pakistan period. After the independent of Bangladesh, there are around six Acts were passed for regulating and developing the agricultural sector in Bangladesh. From the very beginning of the year 1990, the government had taken many steps for the development and conservation of the environment in Bangladesh. In this regard, the government of Bangladesh passed the Bangladesh Environment Conservation Act, 1995, which is a landmark in the history of environmental laws. It is an Act that is applicable to all the sectors of environment in Bangladesh.

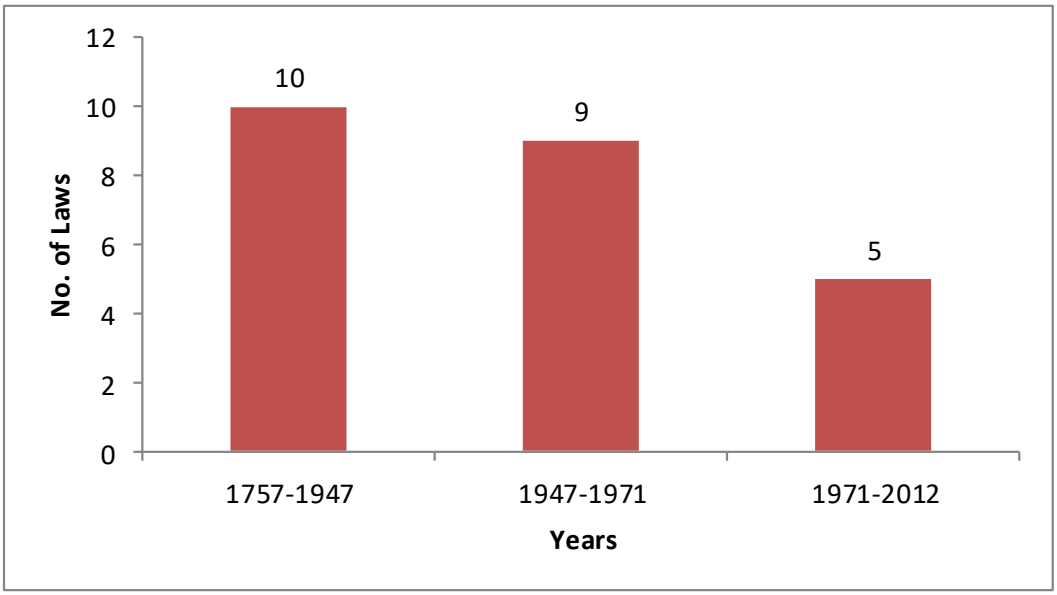


Figure 3.2
Development Trends of Sectoral Agricultural Laws in Bangladesh

3.4.2 Development of Fisheries Law (Figure 3.3)

Fisheries -area sub sector of agriculture in context of Bangladesh economy. Agriculture and its significance are very important that observed from the early stage of the earth. So, with the development of agriculture the fisheries also bear significance role. Some evidence indicates that the fisheries legislations were enacted basically from the year of 1757 with the introduction of the permanent settlement Act, by the British ruler in the Indian subcontinent. It is gradually developed for fisheries resource managements and developments. Historically it is observed that there are two kinds of laws that regulate and

govern fisheries and fisheries resources in Bangladesh such as the Substantive law Procedural law. The development of fisheries laws depends on both substantive and the procedural laws. The substantive laws are those, which original by nature, and there is no alternative. On the other hand, the procedural laws are those, which are used for maintaining the substantive laws. The substantive laws discussed here are enacted by the parliament as well as passed in the form of Ordinance. From the British period to at present marry fisheries laws passed in the form of Act, Rule, Ordinance Circular, and Gazette with in course of time demands (National Plan Acts, Rules and Policies related to Fish).

In fact, the history of fisheries laws has a long way (Nazrul Islam, The Primitive History of Aquaculture: Mas Chase-er-Gorar Kotha) in the human civilization. The fisheries law is originated from the British period started with the Permanent Settlement Act, 1757. A few laws of fisheries (Mrs. Syda Rezwana, Legal Status of Fisheries Laws, Dhaka: Bangladesh Environmental Association, 1999) which are historically importance for the regulations and improvement of fisheries and fish species, are still implemented with some amendment for development of legal mechanisms for fisheries development in Bangladesh. In Bangladesh, the fisheries laves administer the fisheries development in different sectors such as the inland water fisheries, marine fisheries and shrimp culture. Categorically, there are three kinds of fisheries laws passed in this regard. It is identified that there are twelve fisheries laws executed for the regulation and management of the fisheries resources in the country. Of them, there are five Acts, four Ordinances and three Rules still executed in fisheries conservation and development. There is one Act such as the Private Fisheries Protection Act, 1889 passed during the British colonial era. There are three Acts such as the Protection and Conservation of Fish Act, 1950, the Government Fisheries Protection Ordinance, 1959 and the Protection and Conservation of Fish (amendment) Act, 1963 enacted during the Pakistan period. The fisheries laws such as the Bangladesh Fisheries Development Corporation Act, 1973, the Fish and Fish Products (Inspection and Quality Control) Ordinance, 1983, the Marine Fisheries Ordinance, 1983, the Fisheries Research Institute Ordinance, 1984, the Chingri Chas Auvikor Act, 1992, the Chingri Chas Auvikor Rules, 1993 and Protection and Conservation of the Fish (amendment) Rule 1985 are prevailing since the independence of Bangladesh. Later on, the Government passed 'the Bangladesh Environment Conservation Act, 1995, which is a remarkable in the history of environmental laws in Bangladesh covering the fisheries environment and development.

Moreover, the Government has formulated some policies such as the fisheries policy, 1992, fisheries action plan, 1992, the national fisheries policy, 1998 for the protection and

development of fish species and fisheries environment. In this chapter fishery laws and policies executing in Bangladesh will be critically discussed in the aspect of environment whether these laws and policies are environment friendly or damaging some components of environment during the development of fisheries in Bangladesh.

From the water bodies management policy, it is found that there are several departments and committees including ministries engaged in the implementation of the conservation and department activities of fisheries resources in Bangladesh. Under this policy, some coordinating development activities Upazila Parishad, Union Parishad and the professional community. It is observed that inter sectoral incardination regarding management results a lot of suffering to the leaseholders. (A N M Wahid, "Fisheries of Bangladesh: legal status and issues"). This instructional weakness is one of the causes for fisheries resources depletion.

Figure 3.3 Sectoral Development of Fisheries Laws in Bangladesh.

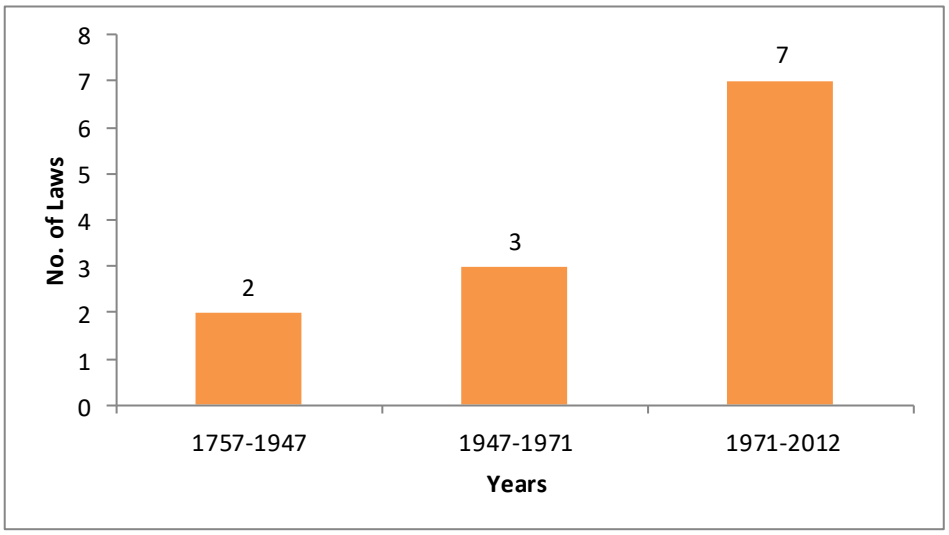


Figure 3.3
Sectoral Development of Fisheries Laws in Bangladesh

3.4.3 Development of Wildlife Conservation Law (Figure 3.4)

These laws are passed to conserve and develop wildlife and domestic animals, prevention of cruelty to animals, restriction on hunting and slaughters, control of consumption of meat, create wildlife sanctuary, livestock diseases and treatment, livestock research, cattle trespass, *etc.* These laws are Cattle Trespass Act 1871, Livestock Importation Act 1898, Farcy Act 1899, Cruelty to Animals Act 1920, Glanders and Bengal Diseases of Animals Act 1944 passed by the British ruler. Laws passed by the Pakistani ruler are Protection

and Conservation of Fish Act 1950, Animal Slaughter Restriction and Meat Control Act 1957, Cattle (Prevention of Trespass) Ordinance 1959, Society for Prevention of Cruelty to Animals Ordinance 1962. Laws passed by the Bangladesh Government are Bangladesh Wildlife (Preservation) Order 1973, Bangladesh Veterinary Practitioners Ordinance1982, Livestock Research Institute Ordinance 1984, Environment Conservation Act 1995 and Environment Action Plan 1992, Biodiversity Act-2012 Bio-Safty Rules 2012, Ecologically Critical Area Management Rules 2012.

Figure 3.4 Sectoral Development of Wildlife Laws in Bangladesh

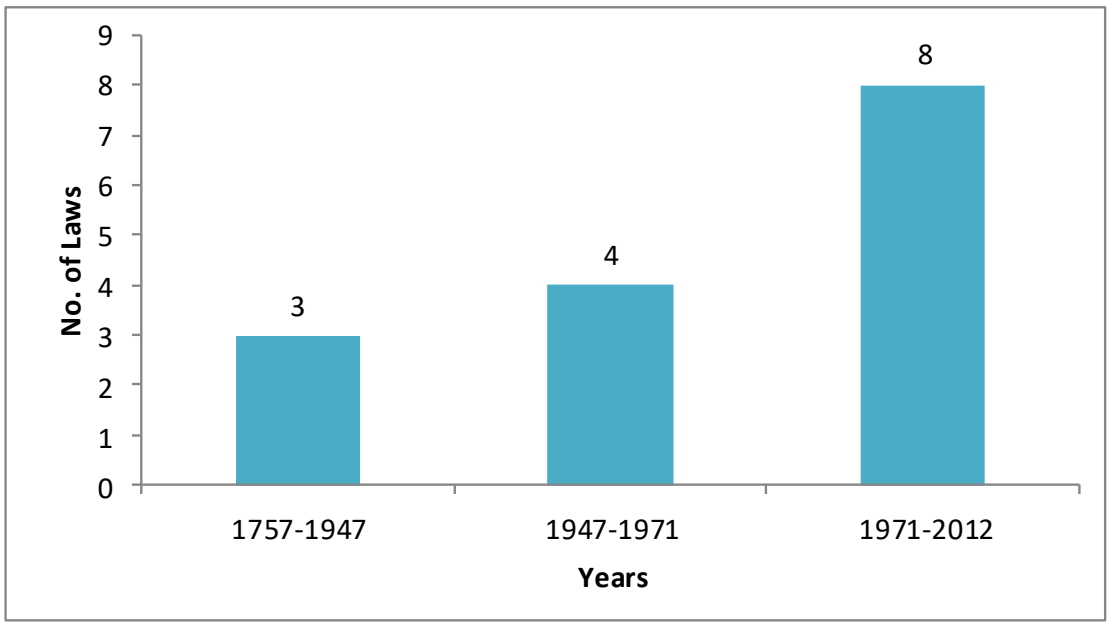


Figure 3.4
Sectoral Development of Wildlife Laws in Bangladesh

Development of Forest Law

There are three Acts passed for the conservation and development of the forest and forest resources, wild life, *etc.*, and controlling and regulating exploitation of forest and forest resources for preventing deforestation and biodiversity degradation, conservation and development of watersheds in forestland such as rivers, canals and other water reservoir, and all flora and fauna of forestland in Bangladcsh. These Acts with a few amendments such as Forest Act 1927, Private Forest Ordinance, 1959, Forest Industries Development Corporation Ordinance 1959, The Attia Forest Protection ordinance 1982. and Environment Conservation Act 1995, Environment Action Plan 1992.

Figure 3.5 Sectoral Development of Forest laws in Bangladesh

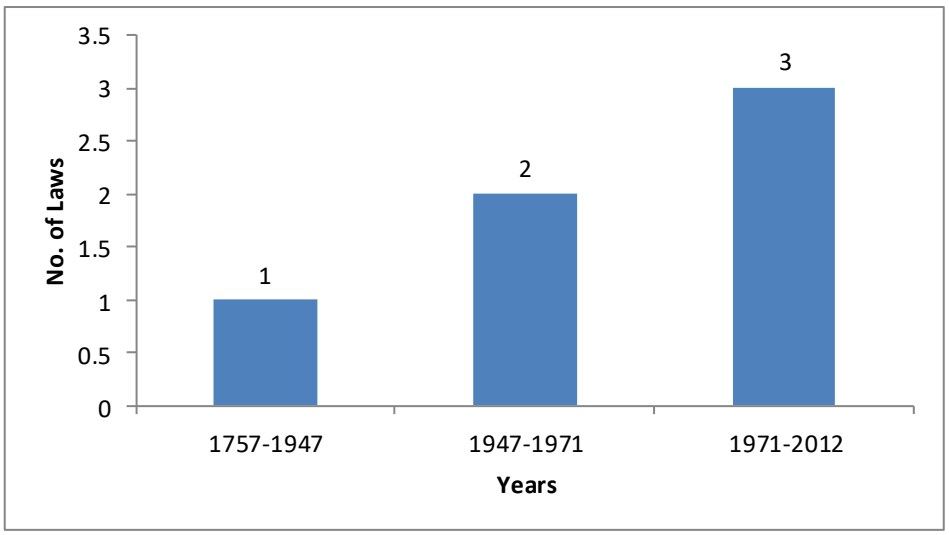


Figure 3.5
Sectoral Developments of Forest Laws in Bangladesh

3.4.4 Development of Water Resources Management Law (Figure 3.6)

Water Pollution and Water Resources Management - There are seven Acts, one Ordinance, two Rules, and one Order for conserving and maintaining watersheds, controlling and regulating water pollution, sustainable planning and use of water resources, conservation of aquatic biodiversity *etc.* These are Embankment and Drainage Act 1952, Bangladesh Water Development Board Order 1972, Territorial Water and Maritime Zones Act 1974, Territorial Water and Maritime Zones Rules 1977, Ground Water Management Ordinance 1985, Water Resources Planning Act 1992, Coast Guard Act 1994, Bangladesh Environment Conservation Act 1995, Bangladesh Environment Conservation Rules 1997. Most of these laws except one Act are enacted after the liberation of Bangladesh.

Coastal Resources Management and Marine Pollution - There are three Acts and Rules for regulate and develop coastal resources, ensure optimal level of harvest, prevent and control marine pollution from different sources and conserve and develop marine resources in Bangladesh. These Acts are Territorial Water and Maritime Zones Act 1974 and Rules 1977, Bangladesh Environment Conservation Act 1995, Bangladesh Environment Conservation Rules 1997.

Figure 3.6 Development of Water Resources Management laws in Bangladesh

Development Trends of Sectoral Water Resources Management Laws in Bangladesh

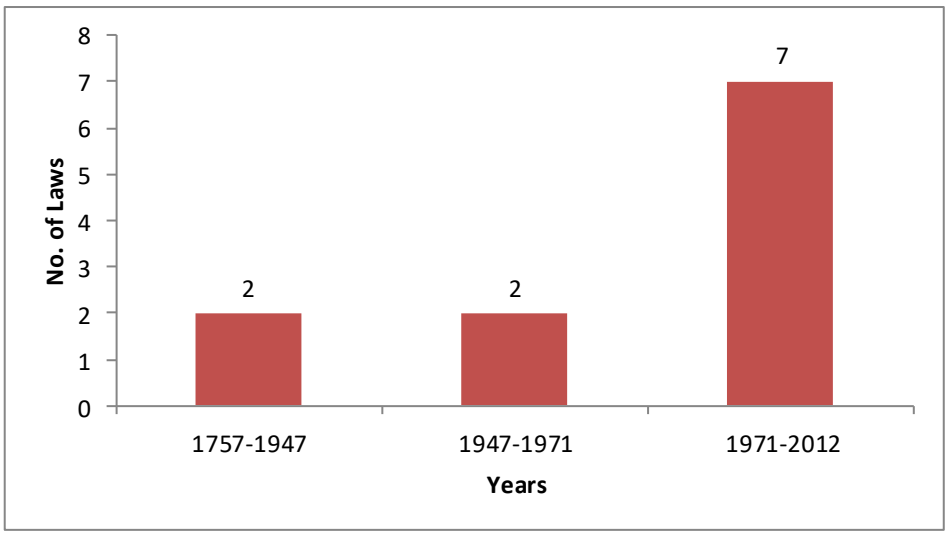


Figure 3.6
Sectoral Developments of Water Resources Management Laws in Bangladesh

3.5 Environmental Policy and Action Plan

3.5.1 Environmental Policy and Action PIan

Bangladesh, as poor and limited resource holding country, is. facing various problems such as over population, poverty, unemployment, unplanned industrial and infrastructure development, over harvest of resources, indiscriminate use of pesticides for agriculture production development, human intervention on nature etc. These are causing some serious environmental problems, such as land erosion, deforestation, land degradation, various pollution, biodiversity degradation, river and watersheds siltation, intrusion of salinity in the rivers, climate changes etc.

Recently, environmental degradation has mounted up to degree that the mankind faces at stake. To cope with the environmental hazards, the government has formulated some measures such as environment policy, environment action plan and legal mechanisms etc. The Government has established the Ministry of Environment and Forest and the Department of Environment (DOE) in order to develop, coordinate and supervise the activities concerning protection and improvement of the environment and environmental resources. It is necessary that these problems are adequately addressed simultaneously along with issues concerning to improvement of environment in an integrated manner.

Implementation of government's commitment to environment and mitigation of other environment related problems the government has taken an integrated Environment Policy 1992 and Environmental Action Plan 1992.

Objectives of the Environment Policy

The following objectives for Environmental Policy are set up to achieve sustainable development of environment and its resources, and in this perspective, necessary action plan and strategies are adopted to achieve the policy,

1) To maintain ecological balance and overall development through protection and improvement of the environment
2) To protect the country against natural disaster
3) To identify and regulate activities which pollute and degrade the environment
4) To ensure environmentally sound development in all sectors
5) To ensure sustainable, long term and environmentally sound use of all national resources
6) To actively remain associate with all international environmental initiatives to the maximum possible extent

In reality, the policies and action plans shall implement on the sectoral basis covering all geographical and ecological regions of Bangladesh. As such, policies towards realization of the overall objectives of this Environment policies and action plan divided into 15 sectors that are discussed.

Industrial Policies and Action Plan

Policies

1) Adoption of corrective measures for polluting industries in phases
2) Under take Environmental Impact Assessment (EIA) for all new industries in both public and private sectors
3) Impose ban on establishment of industries producing goods, which cause environmental pollution; close down such already existing industries in phases and discourage use of such polluting products through development/introduction of their environmentally sound substitutes

4) Encourage development of environmentally sound and appropriate technology and initiatives on research and extension in the fields of industries. Balance such initiatives with the best use of labor and provision of proper wages
5) Prevent wastage of raw materials in industries and ensure their sustainable use

Action plan

1) Industries identified by the Department of Environment will take pollution control measures as soon as possible
2) Existing industries that are potential polluters will make provisions to introduce pollution control measures
3) All new industries either Government or Private will conduct Environment Impact Assessment (EIA) and incorporate pollution control measures.
4) Steps will be taken to shift the industries located in residential areas to appropriate locations, planned industrial zones will be delineated.
5) Approval of new Industries for production of environmentally hazardous and non-biodegradable wastes as goods will be prohibited gradually
6) New industries proposing to use hazardous or poisonous wastes prohibited
7) Industries using heavy metals such as mercury, chromium lead etc., will be initially discouraged and finally prohibited.
8) "Waste permit or consent order" system will be established in the industrial sector, so that waste disposal and waste refinement will be facilitated.
9) Pollutant Industries will install their own pollution monitoring devices.
10) Recycling will be encouraged to reduce waste.
11) Appropriate steps will be taken to ensure protection of health of industrial workers.

Implementing Agencies

a) Ministry of Environment and Forest, b) Ministry of Industries, c) Ministry of Energy and Mineral Resources, d) Ministry of Jute, e) Ministry of Textiles, f) Ministry of Planning, Ministry of Land, g) Ministry of Works, h) Ministry of Commerce, i) Local Government Division, j) Directorate of Textile, k) Department of Environment, I) Department of Textiles, m) Bangladesh Chemical Industries Corporation, n) Bangladesh Jute Mills Corporation, **0)** Bangladesh Sugar and Food Industries Corporation, p) Bangladesh Steel and Engineering Corporation, q)

Bangladesh Petroleum Corporation, r) Bangladesh Small and Cottage Industries Corporation, s) Bangladesh Forest Industries Corporation, t) Urban Development Corporation, u) Dhaka City Corporation, v) Bangladesh Power Development Board, w) Board of Investment, x) Office of the Controller of Import and Exports, y) Deputy Commissioners, z) Thana Administration, zz) NIPSOM, zz) Nationalized Industrial Organization, 3z) Office of the Superintendent of Factories.

Health and Sanitation Policies and Action Plan

Policies

1) Prevent activities, which are harmful to public health in all spheres, including development activities in the country
2) Integrate environmental concerns into the National Health Policy
3) Incorporate environmental issues in health education curriculum
4) Develop healthy environment in the rural and urban areas
5) Ensure healthy workplace for workers

Action Plan

1) Supply of clean water in rural and urban areas will be ensured. Low cost sanitary latrines will be installed instead of unsanitary latrines
2) Waste discharge in rivers, canals and all other water bodies from industries, municipalities and agricultural or other sources will be stringently regulated through enactment and implementation of appropriate laws
3) Open trucks will not be allowed to collect transport or dump garbage during the day in urban area
4) Necessary steps will be taken to protect the environment and public health from the adverse impact of all radioactive substances and waste, atomic substances, radioactive equipment including X-rays, atomic research installations and atomic furnaces etc.

Implementing Agencies

a) Ministry of Health and Family Planning, b) Industry and other related Ministries, c) Local Government Division, d) Science and Technology Division, e) Department of Public Health Engineering, f) Department of Environment, g) Department of Health, h) Department of Textiles, i) Municipal Administration, ,j) Local Government Organizations, k) Atomic Energy Commission.

Fuel and Energy Policy and Action Plan

Policies

1) Reduce and discourage the use of those fuels, which pollute the environment and increase the use of environmentally sound and less harmful fuels
2) Reduce the use of fuel wood, agricultural residues etc., to meet energy need and increase the use of alternative energy sources
3) Adopt appropriate precautionary measures against adverse environmental impact of the use of nuclear energy and take preventive steps against nuclear radiation and pollution
4) Develop improved energy saving technology and proliferate its use
5) Conserve country's fossil fuel reserves and renewable source of energy
6) Conduct Environmental Impact Assessment before implementing the projects for extraction of fuel and mineral resources

Action Plan

1) In the rural areas the use of gas, coal, kerosene and petrol as fuel will be expanded, so that fuel wood, agricultural residues, and cow dung is conserved. This will help use of agricultural residues and cow dung etc., **as** manure. Energy will be supplemented in the rural areas with biogas, solar energy, monohydric-electric units and windmills.
2) Fuel contaminants and additives such as sulfur in diesel and lead in petrol will be reduced, along with other pollutants in various types of fuels
3) Research will be encouraged to discover alternative sources of fuel
4) Careful observation will ensure that there is no adverse impact on the environment due to the primary or industrial consumption of fuel
5) Appropriate measures will be taken to ensure that extraction, distribution and use of natural resources such as oil, gas, coal, peat etc., do not adversely effect the air, water, land, the hydrological balance and the ecosystem
6) The feasibility of the use of lead free petroleum will be studied
7) Large-scale projects will be implemented for introduction and expansion of improved stoves to ensure fuel conservation and protection of the environment
8) To control smoke emission of vehicles, careful consideration will be given before allowing fitness certificates. Along with it, proper legal enforcement will be ensured by conducting mobile courts

Implementing Agencies

a) Ministry of Environment, b) Ministry of Commerce, C) Ministry of Energy and Mineral Resources, d) Ministry of Environment and Forest, e) Ministry of Home f) Science and Technology Division, g) Cabinet Division, h) Roads and Road Transport Division, i) Department of Environment, i) Department of Forest, I) Department of Agriculture Expansion, m) Local Government Organization, p) Bangladesh Petroleum Corporation, q) BRTA, r) BCSIR.

Water Development, Flood Control and Irrigation Policies and Action Plan

Policies

1) Ensure environmentally sound utilization of all water resources
2) Ensure that water development activities and irrigation net-works do not create adverse environmental impact
3) Ensure that all steps taken for flood control, including construction of embankments, dredging of rivers, digging of canals etc; be environmentally sound at the local, zonal and national levels
4) Ensure mitigatory measures of adverse environmental impact of completed water resources development and flood control projects
5) Keep the rivers, canals, ponds, lakes, haors, baors and all other water bodies and water resources free from pollution
6) Ensure sustainable, long term, environ - mentally sound and scientific exploitation and management of the ground and surface water resources
7) Conduct Environmental Impact Assessment before undertaking projects for water resources development and management

Action plan

1) Environmental audit on an emergency basis will be conducted for water resources development, flood control and irrigation projects. Steps to mitigate the adverse impact on the environment identified in the audit will be taken through appropriate modification of these projects
2) Environmental Impact Assessment (EIA) will be incorporated in all new projects. Adverse impact will be prevented through proper steps and adequate investments
3) Treatment of domestic and industrial waste before discharging in rivers, wetlands or other water bodies will be strictly enforced

4) Rivers, canals and other water bodies will be dredged to increase their water holding capacity and navigability

5) Regional and International cooperation will be integrated to strengthen national efforts to control floods, desertification and salinity

6) Steps will be taken to ensure that development project on irrigation, roads and highways, embankments etc; do not impede drainage and sewerage or obstruct the flow and velocity of water. Special projects will be taken to mitigate such problems including other environmental issues

7) Special projects will attempt to recharge aquifers that have low water table. Attempt will be made to rectify the existing projects so the water table does not go down any further

8) Water will be identified as the most important and valuable natural resource. The organizations dealing with water resources development will activate themselves as national resources management agencies

9) Operation and maintenance will be ensured subsequent to execution of projects related to water resources development and management. Regular monitoring will be conducted to evaluate the impact of all projects

10) All organizations involved with water resources management will form their own environment cells

11) Regular surveys, research and monitoring will be conducted on changing Courses and conditions of rivers, wetlands and other water bodies

Implementing Agencies

a) Ministry of Irrigation, Water Development and Flood Control, b) Ministry of Communication, c) Ministry of Shipping, d) Ministry of Environment and Forest, e) Ministry of Foreign Affairs, D Industries and other related Ministries, g) Ministry of Defense, h) Local Government Division, i) Planning Commission, j) Department of Environment, k) Nationalized industrial organizations, 1) Department of Textiles, m) Bangladesh Meteorological Department, n) Bangladesh Agriculture Development Corporation, o) All Related project implementation corporations, p) Bangladesh Water Development Board, q) Bangladesh Sericulture Board, r) Board of Investment, s) BADC,, t) SPARRSO, v) District Administration.

Land policies and Action Plan

Policies

1. Formulate a balanced and environmentally sound national land use policy and plan
2. Prevent land erosion, preserve and increase soil fertility, and expand activities for conservation and environmentally sound management of newly accreted land
3. Encourage land use systems compatible with various eco-systems
4. Prevent spread of salinity and alkalinity on land

Action Plan

1. A national land use plan will be drawn up and implemented on a priority basis. It will be based on land capability and land suitability classification after considering socio-economic reality and comparative needs related to agriculture, afforestation, industrialization, urbanization and housing etc
2. Special integrated land conservation projects will be implemented to arrest desertification in the northern part of the country
3. Appropriate steps will be taken to address issues on soil erosion, fertility conservation, land reclamation and protection and development of land in coastal areas
4. Excavation and leveling of hilly areas, removing soil and rocks, destroying the natural landscape and the ecological balance will not be allowed. Watershed management will be given priority
5. Land use legislation and effective enforcement will be introduced to ensure planned land use
6. People will be duly compensated for acquisition and requisition of land by government and for consequential degradation or damage of their land
7. Regular monitoring, survey and research will be conducted on desertification in the north, land reclamation, diverse land use, conservation of coastal areas, watershed management, soil erosion and degradation

Implementing Agencies

a) Ministry of Land, b) Ministry of Agriculture, c) Ministry of Irrigation, Water Development and Flood Control, d) Ministry of Public Works, e) Ministry of Communication, f) Industry and related other Ministries g) Ministry of Environment and Forest, h) Ministry of Defence I) Local Government Division, j) Departme-nt of Forest,

k) Department of Textile, l) Bangladesh Sericulture Board, m) All Related project implementation corporations, n) BADC, o) Survey of Bangladesh, p) SPARRSO, q) District Administration.

Forest, Wildlife and Bio-diversity Policies and Action Plan

Policies

1. Conserve, expand and develop forest to sustain the ecological balance and meet the socio-economic needs and realities
2. Include tree plantation programmes in all relevant development schemes
3. Stop shrinkage and depletion of forest land and forest resources
4. Develop and encourage use of substitutes of forest products
5. Conserve wildlife and bio-diversity, strengthen related research and help insemination and exchange of knowledge in the concerned area
6. Conserve and develop wetlands and protect migratory bir'ds

Action Plan

1. Steps will be taken to protect present forest resources, prevent deforestation and effect extensive afforestation
2. Enrichment plantation of reserve forests will be accelerated
3. Growsing more treeseand enriching forest resources in the rural areas will be given priority through extensive implementation of social forestry and homestead forestry
4. Agro-forestry will be encouraged to promote multiple use of land, economic and envrionmental development
5. Forest industries will actively attempt to explore alternative source of raw material. They will also make efforts to grow and procure their own raw materials either directly or indirectly
6. Development projects in all sectors will incorporate and implement the government decision of afforestation
7. Effective measures will be taken to ensure direct participation of women in afforestation prograrmmes in thanas and villages
8. Priority will be given to the protection of wildlife, wetlands, birds and animals. Research and development projects will ensure protection of nearly extinct species

9. The present prohibition on hunting and export of wildlife and wildlife hides will continue. Prevention of wildlife habitats, establishment of wildlife sanctuaries will be encouraged
10. Research on biodiversity, exchange of knowledge and experience will be strengthened. For this purpose, research and information centers will be established and surveys will be conducted to assess latest status of wild life and biodiversity
11. Alternative building materials and fuel sources instead of wood and import of wood will be encouraged
12. Regular surveys and research will be conducted to assess the state of deforestation, forest expansion and afforestation

Implementing Agencies

a) Ministry of Environment and Forest, b) Ministry of Agriculture, c) Ministry Commerce,, d) Ministry of Information, e) All Ministries, 0 Planning Commission, g) Local Government Division, h) Science and Technology Division, i) Department of Forest, j) Local Government Organizations, k) Bangladesh Forest Industries Corporation, l) Forest Research Institute, m) BCSIR, n) SPARRSO.

Food Policies and Action Plan

Policies

1. Ensure hygienically and environmentally sound methods for production, preservation, processing and distribution of food
2. Dispose rotten or harmful food stuff and food crops in an environmentally acceptable manner
3. Prohibit import of food items likely to create adverse impact on the environment and public health

Action Plan

1. Adulteration of food will be considered as a serious offense, which will be strictly controlled by amending existing laws
2. Natural methods of preserving food will be encouraged instead of artificial preservatives
3. All imported food stuff including baby foods will be checked for quality, - radiation and other environmental impact

4. Non-agricultural use of agricultural land and production of other crops on land meant for food crops will be regulated
5. The use of toxic pesticides to preserve fruit, vegetables, and pulses from insects and rodents will be strictly regulated

Implementing Agencies

a) Ministry of Food, b) Ministry of Health and Family Planning, c) Ministry of Agriculture, d) Ministry of Commerce, e) Ministry of Environment and Forest, f) Ministry of Information, h) Local Government Division.

Coastal and Marine Environment policies and Action Plan

Policies

1. Ensure environmentally sound conservation and development of coastal and marine eco-systems and resources
2. Prevent all internal and external activities polluting the coastal and marine areas
3. Strengthen necessary research on preserve and develop coastal and marine environmental and resources
4. Limit coastal and marine fish catch within tolerable regeneration or respwaning limits

Action Plan

1. The Ministry of Environment and Forest will establish a special cell to integrate protection, development and monitoring development programmes for the coastal and marine environment
2. Newly accreted land in coastal areas will be handed over to the Department of Forest on a priority basis for stabilization of land and afforestation
3. The navy will take precaution to prevent pollution of territorial waters. The Department of Shipping will monitor such activities
4. Local and national contingency plans will be drawn and funds made available to cope with accidental spillage of pollutants in the sea. Such programmes will be coordinated at the regional level
5. Appropriate measures will be taken on an emergency basis to remove and properly dispose garbage and waste oil and oil products from ships at Chittagong and Mongla Ports
6. The Ministry of Shipping will form a special cell to assess the characteristic and composition of waste before approving its disposal in the sea

7. The Ministry of Shipping will establish a coast guard system on a priority basis to safeguard coastal resources and assist in coastal management
8. Appropriate programmes will ensure protection of territorial waters from pollution, conservation of the coastal and marine environment, conservation of newly accreted land in the coastal areas and proper utilization of coastal resources

Implementing Agencies

a) Ministry of Environment and Forest, b) Ministry of Land, c) Ministry of Shipping, d) Ministry of Defense, e) Department of Forest, f) Department of Environment, g) Depa-sIment of Shipping, h) Forest Research Institute, i) Bangladesh Navy, J) SPARRSO.

Policies

1. Ensure that road, rail, air, and inland water transport systems do not Pollute the environment or **degrade the resources. Conduct Environmental** Impact Assessment before undertaking related projects
2. Ensure that vehicles and people using roads, rails, air and inland waterways do not pollute the environment and take steps to protect health of the workers 'running these transports
3. Control activities in inland ports and dockyards, which cause pollution of water and the local environment

Action Plan

1. Caution will be exercised to ensure that land transport system is environmentally sound and that roads and railways do not impede drainage of water
2. Necessary measures will be taken to ensure that people and vehicles using the railways and road transport do not pollute the environment by discarding pollutants, hazardous waste or **human excreta**
3. Necessary steps will ensure regulation of smoke emission from vehicles, noise control and proper maintenance of vehicles. Local transport industry will arrange necessary inspection to ensure compliance
4. Public awareness will be created and caution taken to ensure that internal water transport system do not cause water pollution
5. Steps will be taken to ensure pollution control of internal ports and dockyards
6. Carefully observation will ensure that construction of airports do not create environmental problems
7. Caution will be observed to reduce air and noise pollution by airplanes
8. Transport systems such as railways that cause less pollution will be encouraged
9. Afforestation will be done along roadside and railways lines

Implementing Agencies

a) Ministry of Communication, b) Ministry of Civil Aviation and Tourism, c) Ministry of Shippirg d) Industry and others concerned Ministries, e) Related Ministries, f) Directorate of Shipping, g) Department of Roads and Highways, h) Department of Forest i) Department of Shipping j) Railway Authority, k) BRTA, l) BIWTC, m) Civil Aviation Authority.

Housing and Urbanization Policies and Action Plan

Policies

1. Integrate environmental considerations into all housing and urban planning activities and research
2. Extend environmentally sound amenities to all the existing urban housing and rural housing areas in phase
3. Control housing and urban development schemes having adverse impact on the local and over all environments
4. Focus greater importance on the role of water bodies in enhancing beatification of the cities

Action Plan

1. Environmental Impact Assessment (EIA) will be conducted before preparing national and regional programmes and master plans regarding housing and urban development
2. Planned rehabilitation of people living in slums in cities will include environmentally sound arrangements
3. To refuse population pressure and improve the environment in major cities, satellite towns will be developed -
4. To improve the environment, intensive afforestation and other development programmes will be taken in Dhaka, Chittagong, Rajshahi and Khulna
5. Intensive and integrated environmental development projects will be taken in the major densely populated cities within the country
6. Steps will be taken for zoning of residential, commercial and industrial areas
7. Programmes related to housing and urban development will be regularly monitored and surveyed

Implementing Agencies

a) Ministry of Public Works, b) Local Government Division, c) Directorate of Urban Development, d) Directorate of Housing and Settlement, e) Corporation related to Urban Development, f) Department of Forest, g) Municipalities, h) Administration related to Shipping.

Population Policies and Action Plan

1. Ensure integrated, planned and environmentally sound utilization of manpower
2. Integrate environmental conservation and development concerns in the population policy and action programme
3. Ensure the role of women in development
4. Encourage utilization of unemployment manpower in development activities

Action Plan

1. A survey will be conducted to relate the impact of present population, high growth rate and population growth until the year 2000 with the resources, development process and the environment for environmental upgradation. Necessary action will be taken on the basis of the survey
2. A plan for human resources development will be formulated to ensure planned, integrated and coordinated utilization of manpower
3. Women's participation and their role in environmental protection and development will be emphasized and ensured
4. Population explosion will be identified as the most serious problem. Necessary steps will be taken to control and stabilize population growth
5. The poorest of the people are the most vulnerable environmental degradation. Therefore, necessary steps will be taken to protect their health and save them from other problems related to deterioration of the environment

Implementing Agencies

a) Ministry of Labour and Manpower, b) Ministry of Environment and Forest, c) Ministry of Health and Family Planning, d) Ministry of Women's Affairs, e) Planning Commission.

Education and public

Awareness Policies and Action Plan

1. Integrate people in the spread of education and overall development of the country through eradication of illiteracy and increase in the rate or literacy
2. Create wide spread mass awareness regarding environmental conservation and improvement, sustainable, long term and environmentally sound utilization of all resources
3. Ensure inclusion and dissemination of environmental knowledge and information in the formal and information systems of education media
4. Induce spontaneous and direct participation of people in all environmental activities
5. Incorporate environmental issues in all government and non-government training programmes and also in such programmes for industrial and commercial workers

Action Plan

1. A five year integrated plan for mass awareness on environment will be taken and implemented by the Ministry of Environment and Forest. The Ministries of Information and Education will provide support and assistance in this regard
2. Environment related curricula will be included in all levels of education and training programmes
3. To create awareness participation of imams, teachers and leaders of all religious, social and voluntary organizations will be ensured

Implementing Agencies

a) Ministry of Education, b) Ministry of Environment and Forest, c) Ministry of Information d) Ministry of Religion, e) Ministry of Social Welfare, of Ministry of Education, g) Islamic Foundation.

Science, Technology and Research policies and Action Plan

1. Incorporate environmental pollution, supervision and control measures into national science and technology policy
2. Encourage necessary research and evolve technology to ensure long term, sustainable and environmentally sound utilization of -all resources for conservation and improvement of environment
3. Incorporate environmental consideration as an integral part of priority areas for research and development within the framework of National Science and Technology Policy (1986)
4. Consideration of environment issues in all research activities by research and development institutions

Action Plan

2 Counselling will be made available on management and control of environmental pollution keeping in view environmentally sound and sustainable technology

3 Research and Technology innovation on environmental protection, development and proper utilization of resources will be strengthened

4 Environmental considerations should be integrated in all priority areas highlighted in the National Policy on Science and Technology, 1986

5 All research and development institution will specifically consider programmes and revise them if needed.

Implementing Agencies

a) Concerned Ministries and Divisions, b) Science and Technology Division, c) Science and Technology related Research Institutions, d) Various Research Institutions

Legal Framework Policies and Action Plan

Policies

1. Amend all laws and regulations related to protection of environment, conservation of natural resources, and control of environmental pollution and degradation with a view to meet present day's need
2. Frame new laws iii all sectors necessary to control activities concerning environmental pollution and degradation
3. Ensure proper implementation of all relevant laws or regulations and create wide spread public awareness in this regard

Action Policies

1. An interministerial committee will review the present laws dealing with the environment and make necessary amendments
2. This committee will identify and recommend other areas where new legislation need to be enacted
3. From now on, concerned minristries will ensure that proposed legislations are environmentally compatible.

Implementing Agencies

a) Ministry of Law and Justice, b) Ministry Environment and Forest, c) All related Ministries.

Organizational Structure

1. Above-mentioned ministries, divisions and government organizations will take necessary steps to implement relevant development programmes within their own jurisdiction in an environmentally sound manner
2. Non government sectors and organizations will be encouraged to participate in implementing environmental conservation and development programmes
3. The Ministry of Environment and Forest will coordinate Implementation of environmental programmes
4. A national environmental committee will be formed under the chairpersonship of the head of the government. This committee will provide guidelines for implementation of environmental action plan. Ministers of concerned ministries or divisions will be members of this committee. The Secretary of the Ministry of Environment and Forest will be the member secretary. The committee will meet at least once a year
5. In the context of the need to assess the environmental impact of development projects, the manpower and technical capability of the Ministry of Environment and Forest and Department of Environment will be expanded. Environmental training will be provided to Officers concerned with p1pnning. Project concept papers and project proposals will mention environmental impact in detail
6. The Ministry of Environment and Forest will formulate, publish and circulate a "state of the environment report" every five years
7. The Ministry of Environment and Forest will modify and reformulate the environment policy and action plan as and when necessary in future

Implementing Agencies

a) Prime Minister's Office, b) Ministry of Environment and Forest, c) Concerned Ministries, d) Cabinet Division, e) Planning Commission, f) NGO Bureau.

3.6 Conclusion

In conclusion, from the above discussion, it would be said that the development trend of environmental law in the Indian subcontinent has a long history started from the British period. During the British period, around 57 environmental legislations passed with the landmark Public Health Act, 1875 and some other laws such River Pollution Act, 1876 *etc.*, that, at that times, might had no identity of environmental laws but at present days its called environmental laws. Laws and policies relating to the environment developed in

the British period are very important for Indian Subcontinent. Because after independence from the British, government of Pakistan passes various environment related laws depending on or based on those of laws passed in the British colonial era. Of them some important acts are Factories Act, 1965, Private Forest Act, 1859, Town Improvement Act 1953, Inland Water Transport Authority Ordinance, 1958 *etc.*

Government of Bangladesh enacted around 100 Environmental Acts after its independence in 1971 from Pakistan for further development of environmental laws and policies to develop and conserve of every sector of environment in Bangladesh. Environmental Laws and policies develop with the course of environmental degradation in Bangladesh.

However, government gives priorities to the environmental problems in Bangladesh in nineties. For mitigating and bring in optimal level of these problems and develop and conserve the environment and it resources, the Government of Bangladesh enacted some very important environmental legislation such as the Bangladesh Environment Conservation Act, 1995, Bangladesh Environment Conservation Rules, 1997, the Environment Court Act, 2000 and Environment Policy and Environmental Action Plan 1992. It is also notable that the Environment Court deals with the environmental offences and its remedies independently which is not adjudicated before enactment of the Bangladesh Environment Conservation Act, 1995. Concerning Ministries and its Departments such as Ministry of Agriculture, Fisheries, Forest, Industries *etc.*, and its department is working for ensuring the objectives of the Environment laws, policies and Environmental Action Plan in Bangladesh.

Chapter 4
International Laws and Global Environment

4.1 Introduction

International Environmental Law on biodiversity formulates rules and regulations to protect biodiversity on a global basis. The relationship between economic development and environmental degradation was first placed on the international agenda in 1972, at the UN Conference on the Human Environment, held in Stockholm. After the Conference, Governments set up the United Nations Environment Program (UNEP), which today continues to act as a global catalyst for action to protect the environment.

In 1983 The UN set up the World Commission on Environment and Development, environmental degradation, which had been seen as a side effect of industrial wealth with only a limited impact, was understood to be a matter of survival for developing nations, Led by Gro Harlem Brundtland of Norway, The Commission put forward the concept of sustainable development as an alternative approach to one simply based on economic growth - one "which meets the needs of the present without compromising the ability of future generations to meet their own needs".

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

Five years on from the Brundtland Report, the UN General Assembly asked for a report on progress made towards sustainable development and held the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992.

The Convention on Biological Diversity was opened for signature at the Earth Summit, and made a start towards redefinition of money supply measures that did not inherently encourage destruction of natural Eco-regions and so-called uneconomic growth.

4.2 Re De Janeiro (The Earth Summit)

In 1992, The Earth Summit was held in Re De Janeiro of Brazil with a view to distributing the facilities created by saving biodiversity, sustainable use of its elements and using biotic resources.

In Rio, 108 Governments of the world represented by heads of State or Government - adopted three major agreements aimed at changing the traditional approach to development.

- Agenda 21-a comprehensive program of action for global action in all areas of sustainable development
- The Rio Declaration on Environment and Development -a series of principles defining the rights and responsibilities of States
- The Statement of Forest Principles- a set of principles to underlie the sustainable management of forests worldwide

In addition, two legally binding Conventions aimed at preventing global climate change and the eradication of the diversity of biological species were opened for signature at the Summit, giving high profile to these efforts:

(i) The United Nations Framework Convention on Climate Change
(ii) The Convention on Biological Diversity.

4.2.1 Agenda 21

Agenda 21 addresses today's pressing problems and aims to prepare the world for the challenges of the next century. It contains detailed proposals for action in social and economic areas (such as combating poverty, changing patterns of production and consumption and addressing demographic dynamics), and for conserving and managing the natural resources that are the basis for life-protecting the atmosphere, oceans and biodiversity; preventing deforestation; and promoting sustainable agriculture, for example.

Governments from the participant countries agreed that the integration of environment and development concerns would lead to the fulfillment of basic needs, improved standards for all, better protected and better managed ecosystems, a safer and a more prosperous future. "No nation can achieve this on its own. Together we can within the global partnership for sustainable development", states the preamble.

The programme of action also recommends ways to strengthen the part played by major groups- women, trade unions, farmers, children and young people, indigenous peoples, the scientific community, local authorities, business, industry and non-governmental organizations (NGOs) in achieving sustainable development.

In addition, three bodies were created within the United Nations to ensure full support for implementation of Agenda 21 worldwide:

- The UN Commission on Sustainable Development, which first met in June 1993;
- The Inter-agency Committee on Sustainable Development, set up by the Secretary-General in 1992 to Ensure Effective System-Wide Cooperation and Coordination in the Follow-up to the Summit; and
- The High-level Advisory Board on Sustainable Development, Established in 1993 to advise the Secretary-General and the Commission on issues Relating to the Implementation of Agenda 21

In adopting Agenda 21, the Earth Summit also requested the United Nations to initiate talks aimed at halting the rapid depletion of certain fish stocks and preventing conflict over fishing on the high seas. After negotiations spanning more than two years, the UN Agreement on High Seas Fishing was opened for signature on 4 December 1995. It provides for all species of straddling and highly migratory fish those which swim between national economic zones or migrate across broad areas of the ocean to be subject to quotas designed to ensure the continued survival of fish for our children and grandchildren to enjoy.

4.2.2 The Rio Declaration on Environment and Development

The Rio Declaration on Environment and Development is a series of principles defining the rights and responsibilities of States. It emphasis on the following issues:

- The Rio Declaration on Environment and Development supports Agenda 21 by defining the rights and responsibilities of States regarding these issues. Among its principles: human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.
- Scientific uncertainty should not delay measures to prevent environmental degradation where there are threats of serious or irreversible damage;

- States have a sovereign right to exploit their own resources but not to cause damage to the environment of other States;
- Eradicating poverty and reducing disparities in worldwide standards of living are "indispensable" for sustainable development;
- The full participation of women is essential for achieving sustainable development; and
- The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources, they command.

4.2.3 The Statement of Forest Principles

The Statement of Forest Principles, the non-legally binding statement of principles for the sustainable management of forests, was the first global consensus reached on forests. Its provisions are:

- All Countries, Notably Developed Countries, should make an effort to "Green the World" through Reforestation and Forest Conservation;
- States have a right to Develop Forests According to their Socio-Economic Needs, in Keeping with National Sustainable Development Policies; and
- Specific Financial Resources should be provided to Develop Programmes that Encourage Economic and Social Substitution Policies.

At the Summit, the UN was also called on to negotiate an international legal agreement on desertification, to hold talks on preventing the depletion of certain fish stocks, to devise a programme of action for the sustainable development of small island developing States and to establish mechanisms for ensuring the implementation of the Rio accords.

4.3 International Convention on Biological Diversity, 1992

Signed **:** 5 June 1992
Location **:** Rio de Janeiro
Effective **:** 29 December 1993
Condition **:** 30 ratifications
Signatories **:** 168
Parties **:** 193
Depositary **:** Secretary-General of the United Nations

The **Convention on Biological Diversity** (**CBD**), known informally as the **Biodiversity Convention**, is an international legally binding treaty. The Convention has three main goals:

1. conservation of biological diversity (or biodiversity);
2. sustainable use of its components; and
3. fair and equitable sharing of benefits arising from genetic resources

In other words, its objective is to develop national strategies for the conservation and sustainable use of biological diversity. It is often seen as the key document regarding sustainable development.

The Convention was opened for signature at the Earth Summit in Rio de Janeiro on 5 June 1992 and entered into force on 29 December 1993.

2010 was the International Year of Biodiversity. The Secretariat of the Convention on Biological Diversity is the focal point for the International Year of Biodiversity. At the 2010 10th Conference of Parties (COP) to the Convention on Biological Diversity in October in Nagoya, Japan, the Nagoya Protocol was adopted.[1] On 22 December 2010, the UN declared the period from 2011 to 2020 as the UN-Decade on Biodiversity. They, hence, followed a recommendation of the CBD signatories during COP10 at Nagoya in October 2010. About the convention

The convention recognized for the first time in international law that the conservation of biological diversity is "a common concern of humankind" and is an integral part of the development process. The agreement covers all ecosystems, species, and genetic resources. It links traditional conservation efforts to the economic goal of using biological resources sustainably. It sets principles for the fair and equitable sharing of the benefits arising from the use of genetic resources, notably those destined for commercial use. It also covers the rapidly expanding field of biotechnology through its Cartagena Protocol on Biosafety, addressing technology development and transfer, benefit-sharing and biosafety issues. Importantly, the Convention is legally binding; countries that join it ('Parties') are obliged to implement its provisions.

The convention reminds decision-makers that natural resources are not infinite and sets out a philosophy of sustainable use. While past conservation efforts were aimed at

protecting particular species and habitats, the Convention recognizes that ecosystems, species and genes must be used for the benefit of humans. However, this should be done in a way and at a rate that does not lead to the long-term decline of biological diversity.

The convention also offers decision-makers guidance based on the precautionary principle that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat. The Convention acknowledges that substantial investments are required to conserve biological diversity. It argues, however, that conservation will bring us significant environmental, economic and social benefits in return.

The Convention on Biological Diversity of 2010 would ban some forms of geoengineering.[2]

Issues under the convention

Some of the many issues dealt with under the convention include:

- Measures and incentives for the conservation and sustainable use of biological diversity.
- Regulated access to genetic resources and traditional knowledge, including Prior Informed Consent of the party providing resources.
- Sharing, in a fair and equitable way, the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources (governments and/or local communities that provided the traditional knowledge or biodiversity resources utilized).
- Access to and transfer of technology, including biotechnology, to the governments and/or local communities that provided traditional knowledge and/or biodiversity resources.
- Technical and scientific cooperation.
- Coordination of a global directory of taxonomic expertise (Global Taxonomy Initiative).
- Impact assessment.
- Education and public awareness.
- Provision of financial resources.
- National reporting on efforts to implement treaty commitments.

Cartagena Protocol

Main article: Cartagena Protocol on Biosafety

The **Cartagena Protocol on Biosafety** of the Convention, also known as the Biosafety Protocol, was adopted in January 2000. The Biosafety Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology.

The Biosafety Protocol makes clear that products from new technologies must be based on the precautionary principle and allow developing nations to balance public health against economic benefits. It will for example let countries ban imports of a genetically modified organism if they feel there is not enough scientific evidence the product is safe and requires exporters to label shipments containing genetically modified commodities such as corn or cotton.

The required number of 50 instruments of ratification/accession/approval/acceptance by countries was reached in May 2003. In accordance with the provisions of its Article 37, the Protocol entered into force on 11 September 2004.

Global Strategy for Plant Conservation

Main article: Global strategy for plant conservation

In April 2002, the parties of the UN CBD adopted the recommendations of the Gran Canaria Declaration Calling for a Global Plant Conservation Strategy, and adopted a 16-point plan aiming to slow the rate of plant extinctions around the world by 2010.

Parties

192 countries and the European Union are parties to the convention.[3] All UN member states—with the exception of the United States, Andorra, and South Sudan—have ratified the treaty. Non-UN member states that have ratified are the Cook Islands and Niue. The Holy See and the states with limited recognition are non-parties. The US has signed but not ratified the treaty,[4] and is unlikely to now that they have passed into law the Monsanto Protection Act of 2013.

International bodies established by the convention

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

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

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

Subsidiary body for Scientific, Technical and Technological Advice (SBSTTA): The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA). The SBSTTA is a committee composed of experts from member governments competent in relevant fields. It plays a key role in making recommendations to the COP on scientific and technical issues. 13th Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA-13) held from 18 to 22 February 2008 in the Food and Agriculture Organization at Rome, Italy. SBSTTA-13 delegates met in the Committee of the Whole in the morning to finalize and adopt recommendations on the in-depth reviews of the work programmes on agricultural and forest biodiversity and SBSTTA's modus operandi for the consideration of new and emerging issues. The closing plenary convened in the afternoon to adopt recommendations on inland waters biodiversity, marine biodiversity, invasive alien species and biodiversity and climate change. The current chairperson of the SBSTTA is Dr. Senka Barudanovic.

Country implementation

National Biodiversity Strategies and Action Plans (NBSAP)

"National Biodiversity Strategies and Action Plans (NBSAPs) are the principal instruments for implementing the Convention at the national level (Article 6). The Convention requires countries to prepare a national biodiversity strategy (or equivalent instrument) and to ensure that this strategy is mainstreamed into the planning and activities of all those sectors whose activities can have an impact (positive and negative) on biodiversity. To date [2012-02-01], 173 Parties have developed NBSAPs in line with Article 6.

For example, the United Kingdom, New Zealand and Tanzania have carried out elaborate responses to conserve individual species and specific habitats. The United States of America, a signatory who has not yet ratified the treaty, has produced one of the most thorough implementation programs through species Recovery Programs and other mechanisms long in place in the USA for species conservation.

Singapore has also established a detailed National Biodiversity Strategy and Action Plan. The National Biodiversity Centre of Singapore represents Singapore in the Convention for Biological Diversity.

National Reports

In accordance with Article 26 of the Convention, Parties prepare national reports on the status of implementation of the Convention.

Executive secretary to the convention

The current executive secretary is Braulio Ferreira de Souza Dias, who took up this post on 15 February 2012. Dr Ahmed Djoghlaf was the previous executive secretary.

Nagoya Protocol

The **Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity**[8] is a supplementary agreement to the Convention on Biological Diversity. It provides a transparent legal framework for the effective implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the

utilization of genetic resources. The Protocol was adopted on 29 October 2010 in Nagoya, Aichi Province, Japan, and will enter into force 90 days after the fiftieth instrument of ratification. Its objective is the fair and equitable sharing of benefits arising from the utilization of genetic resources, thereby contributing to the conservation and sustainable use of biodiversity.[9]

Relevance

The Nagoya Protocol is intended to create greater legal certainty and transparency for both providers and users of genetic resources by:

- Establishing more predictable conditions for access to genetic resources.
- Helping to ensure benefit-sharing when genetic resources leave the contracting party providing the genetic resources

By helping to ensure benefit-sharing, the Nagoya Protocol creates incentives to conserve and sustainably use genetic resources, and therefore enhances the contribution of biodiversity to development and human well-being.

Scope

The Nagoya Protocol applies to genetic resources that are covered by the CBD, and to the benefits arising from their utilization. The Nagoya Protocol also covers traditional knowledge (TK) associated with genetic resources that are covered by the CBD and the benefits arising from its utilization

Obligations

The Nagoya Protocol sets out core obligations for its contracting Parties to take measures in relation to access to genetic resources, benefit-sharing and compliance.

Access obligations

Domestic-level access measures are to:

- Create legal certainty, clarity and transparency
- Provide fair and non-arbitrary rules and procedures
- Establish clear rules and procedures for prior informed consent and mutually agreed terms

- Provide for issuance of a permit or equivalent when access is granted
- Create conditions to promote and encourage research contributing to biodiversity conservation and sustainable use
- Pay due regard to cases of present or imminent emergencies that threaten human, animal or plant health
- Consider the importance of genetic resources for food and agriculture for food security

Benefit-sharing obligations

Domestic-level benefit-sharing measures are to provide for the fair and equitable sharing of benefits arising from the utilization of genetic resources with the contracting party providing genetic resources. Utilization includes research and development on the genetic or biochemical composition of genetic resources, as well as subsequent applications and commercialization. Sharing is subject to mutually agreed terms. Benefits may be monetary or non-monetary such as royalties and the sharing of research results.

Compliance obligations

Specific obligations to support compliance with the domestic legislation or regulatory requirements of the contracting party providing genetic resources, and contractual obligations reflected in mutually agreed terms, are a significant innovation of the Nagoya Protocol. Contracting Parties are to:

- Take measures providing that genetic resources utilized within their jurisdiction have been accessed in accordance with prior informed consent, and that mutually agreed terms have been established, as required by another contracting party
- Cooperate in cases of alleged violation of another contracting party's requirements
- Encourage contractual provisions on dispute resolution in mutually agreed terms
- Ensure an opportunity is available to seek recourse under their legal systems when disputes arise from mutually agreed terms
- Take measures regarding access to justice
- Take measures to monitor the utilization of genetic resources after they leave a country including by designating effective checkpoints at any stage of the value-chain: research, development, innovation, pre-commercialization or commercialization

Implementation

The Nagoya Protocol's success will require effective implementation at the domestic level. A range of tools and mechanisms provided by the Nagoya Protocol will assist contracting Parties including:

- Establishing national focal points (NFPs) and competent national authorities (CNAs) to serve as contact points for information, grant access or cooperate on issues of compliance
- An Access and Benefit-sharing Clearing-House to share information, such as domestic regulatory ABS requirements or information on NFPs and CNAs
- Capacity-building to support key aspects of implementation.

  Based on a country's self-assessment of national needs and priorities, capacity-building may help to:
- Develop domestic ABS legislation to implement the Nagoya Protocol
- Negotiate MAT
- Develop in-country research capability and institutions
- Raise awareness
- Transfer technology
- Target financial support for capacity-building and development initiatives through the GEF.

4.4 The Cartagena Protocol on Biosafety, 2000

4.4.1 About the Protocol

The *Cartagena Protocol on Biosafety to the Convention on Biological Diversity* is an international treaty governing the movements of living modified organisms (LMOs) resulting from modern biotechnology from one country to another. It was adopted on 29 January 2000 as a supplementary agreement to the Convention on Biological Diversity and entered into force on 11 September 2003.

4.5 Introduction

On 29 January 2000, the Conference of the Parties to the Convention on Biological Diversity adopted a supplementary agreement to the Convention known as the Cartagena Protocol on Biosafety. The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology.

It establishes an advance informed agreement (AIA) procedure for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to the import of such organisms into their territory. The Protocol contains reference to a precautionary approach and reaffirms the precaution language in Principle 15 of the Rio Declaration on Environment and Development. The Protocol also establishes a Biosafety Clearing-House to facilitate the exchange of information on living modified organisms and to assist countries in the implementation of the Protocol.

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4.5.1 History

Pursuant to Article 19, paragraph 3, of the Convention on Biological Diversity, the Conference of the Parties, by its decision II/5, established an Open-ended Ad Hoc Working Group on Biosafety to develop a draft protocol on biosafety, specifically focusing on transboundary movement of any living modified organism resulting from modern biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity.

The Open-ended Ad Hoc Working Group on Biosafety held six meetings between July 1996 and February 1999. At its conclusion, the Working Group submitted a draft text of the Protocol, as well as the outstanding concerns of the Parties, for consideration by Conference of the Parties at its first extraordinary meeting, convened for the purpose of adopting a protocol on biosafety to the Convention on Biological Diversity.

In accordance with decision IV/3, the first extraordinary meeting of the Conference of the Parties was opened on 22 February 1999, in Cartagena, Colombia. The Conference of the Parties was not able to finalize its work in the time available. As a result, by decision EM-I/1, the Conference of the Parties suspended its first extraordinary meeting and agreed that it should be reconvened as soon as possible and in any event no later than the fifth meeting of the Conference of the Parties.

The resumed session took place in Montreal from 24 to 29 January 2000 and was preceded by regional and interregional informal consultations from 20 to 23 January 2000 at the same venue. On 29 January 2000, the Conference of the Parties, by its decision

EM-I/3, adopted the Cartagena Protocol on Biosafety to the Convention on Biological Diversity and approved interim arrangements pending its entry into force. It established an open-ended ad hoc Intergovernmental Committee for the Cartagena Protocol on Biosafety (ICCP) with a mandate to undertake the preparations necessary for the first meeting of the Parties to the Protocol.

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4.5.2 The ICCP Process

The Intergovernmental Committee for the Cartagena Protocol on Biosafety (ICCP) was established in decision EM-I/3 adopting the Cartagena Protocol on Biosafety, to undertake the preparations necessary for the first meeting of the Parties to the Protocol.

Following its establishment, the ICCP convened an organizational meeting on 29 January 2000, chaired by Ambassador Yang of Cameroon, and elected a Bureau to oversee its activities. The members elected to the Bureau were: Cameroon (Chair), Denmark, India, Islamic Republic of Iran, Peru, Poland, Saint Kitts and Nevis, South Africa, Switzerland and Ukraine. At the first meeting of the ICCP, Denmark was replaced by France. The first task of the Bureau was to develop a work plan for the ICCP which was submitted, to and endorsed by, the fifth meeting of the Conference of the Parties in May 2000.

The ICCP held three meetings between 2000 and 2003. The first meeting (ICCP 1) was held 11-15 December 2000 in Montpellier, France; the second meeting (ICCP 2) was held 1-5 October 2001 in Nairobi, Kenya; and the third meeting (ICCP 3) was held 22-26 April 2002 in The Hague, The Netherlands, back-to-back with the sixth meeting of the Conference of the Parties.

The ICCP Bureau held more than 10 oversight meetings over a period of four years of its existence. The ICCP submitted its final report to the first meeting of the Parties to the Protocol which was held 23-27 February 2004 in Kuala Lumpur, Malaysia.

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4.5.3 Entry into force

The Protocol entered into force on 11 September 2003, ninety days after the deposit of the fiftieth instrument of ratification. In accordance with Article 29, paragraph 1, of the Protocol, the COP to the Convention serves as the meeting of the Parties to the Protocol (COP-MOP), the governing body of the Protocol. An overview of the COP-MOP activity is provided in the Meetings of the COP-MOP page.

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Timeline of the Cartagena Protocol on Biosafety

1993 ***The Convention on Biological Diversity enters into force on 29 December 1993***

1995	COP2	Second meeting of the Conference of the Parties - Consideration of the need for and modalities of a protocol for the safe transfer, handling and use of living modified organisms. *Jakarta, Indonesia, 6 - 17 November 1995*	Decision II/5
1996	COP3	Third meeting of the Conference of the Parties - Issues related to biosafety. *Buenos Aires, Argentina, 4 - 15 November 1996*	Decision III/20
1996	BSWG1	First meeting of the Open-Ended *Ad Hoc* working Group on Biosafety. *Aarhus, Denmark, 22 - 26 July 1996*	Meeting Documents
1997	BSWG2	Second meeting of the Open-Ended *Ad Hoc* working Group on Biosafety. *Montreal, Canada, 12 - 16 May 1997*	Meeting Documents
1997	BSWG3	Third meeting of the Open-Ended *Ad Hoc* working Group on Biosafety. *Montreal, Canada, 13 - 17 October 1997*	Meeting Documents
1998	BSWG4	Fourth meeting of the Open-Ended *Ad Hoc* working Group on Biosafety. *Montreal, Canada, 5 - 13 February 1998*	Meeting Documents
1998	COP4	Fourth meeting of the Conference of the Parties - Issues related to biosafety. *Bratislava, Slovakia, 4 - 15 May 1998*	Decision IV/3

1998	BSWG5	Fifth meeting of the Open-Ended *Ad Hoc* working Group on Biosafety. *Montreal, Canada, 17 - 28 August 1998*	Meeting Documents
1999	BSWG6	Sixth meeting of the Open-Ended *Ad Hoc* working Group on Biosafety. *Cartagena, Colombia, 14 - 19 February 1999*	Meeting Documents
1999	BSIC1	Informal Consultation on the process to resume the Extraordinary Meeting of COP to adopt a protocol on Biosafety. *Montreal, Canada, 1 July 1999*	Meeting Documents
1999	BSIC2	Second Informal Consultation on the process to resume the Extraordinary Meeting of COP to adopt a protocol on Biosafety. *Vienna, Austria, 15 - 19 September 1999*	Meeting Documents
1999 - 2000	EXCOP1	First Extraordinary Meeting of the Conference of the Parties - Decisions on the continuation of the first extraordinary meeting of the Conference of the Parties to the Convention on Biological Diversity, ***adoption of the Cartagena Protocol*** and interim arrangements. *Cartagena, Colombia 22 - 23 February 1999 and Montreal, Canada, 24 - 28 January 2000*	Decisions EM-I/1-3
2000	COP5	***The Cartagena Protocol on Biosafety is opened for signature.*** Fifth meeting of the Conference of the Parties - Work plan of the Intergovernmental Committee for the Cartagena Protocol on Biosafety. *Nairobi, Kenya, 15 - 26 May 2000*	Decision V/1
2000	ICCP1	First meeting of the Intergovernmental Committee for the Cartagena Protocol on Biosafety. *Montpellier, France, 11 - 15 December 2000*	Meeting Documents
2001	ICCP2	Second meeting of the Intergovernmental Committee for the Cartagena Protocol on Biosafety. *Nairobi, Kenya, 1 - 5 October 2001*	Meeting Documents

2002	COP6	Sixth meeting of the Conference of the Parties - Intergovernmental Committee for the Cartagena Protocol on Biosafety. *The Hague, Netherlands, 7 - 19 April 2002*	Decision VI/1
2002	ICCP3	Third meeting of the Intergovernmental Committee for the Cartagena Protocol on Biosafety. *The Hague, Netherlands, 22 - 26 April 2002*	Meeting Documents

2003 ***The Cartagena Protocol on Biosafety enters into force on 11 September 2003***

4.6 Work plan of the Intergovernmental Committee for the Cartagena Protocol on Biosafety

The Conference of the Parties,

Welcoming the signatures of the Cartagena Protocol on Biosafety that have already taken place and reiterating the call of decision EM-I/3 to all Parties to the Convention on Biological Diversity to sign the Protocol at the earliest opportunity, and to deposit instruments of ratification, acceptance or approval, or instruments of accession, as appropriate, as soon as possible,

Reiterating also the call of decision EM-I/3 upon States that are not Parties to the Convention to ratify, accept, approve or accede to it, as appropriate, without delay, thereby enabling them also to become Parties to the Protocol,

Recalling the mandate given to the open-ended ad hoc Intergovernmental Committee for the Cartagena Protocol on Biosafety in decision EM-I/3 to undertake, with the support of the Executive Secretary, the preparations necessary for the first meeting of the Parties to the Protocol,

Reaffirming that the meeting of the Parties is the only sovereign body with regard to the implementation of the Protocol, Emphasizing the preparatory character of the work to be undertaken by the Intergovernmental Committee in order to facilitate the work of the first meeting of the Parties to the Protocol,

Underscoring therefore that, without prejudice to the provisions of the Protocol, including time-frames, the meeting of the Parties is the only body entitled to decide on issues that are required to be addressed during its meetings, and to what extent and in which manner it wishes to use the preparatory work of the Intergovernmental Committee,

Noting that a work programme should reflect all issues that the meeting of the Parties to the Protocol might wish to address at its first meeting,

Emphasizing the necessity to complete as early as possible the preparations for the entry into force of the Protocol,

Emphasizing also the priority of launching the Biosafety Clearing-House no later than the entry into force of the Protocol, and also the need to engage in capacity-building as soon as possible,

Welcoming the decision taken by the Council of the Global Environment Facility at its fifteenth meeting with regard to supporting activities that will assist countries to prepare for the entry into force of the Protocol,

1. Endorses the work plan for the Intergovernmental Committee for the Cartagena Protocol on Biosafety as contained in the annex to the present decision;

2. Requests the Executive Secretary to invite all relevant stakeholders to contribute to the development and/or strengthening of capacities in biosafety for the purpose of the effective implementation of the Protocol, in particular in developing country Parties, and to report on progress made to the first meeting of the Parties;

3. Requests also the Executive Secretary to convene, prior to the first meeting of the Intergovernmental Committee for the Cartagena Protocol on Biosafety, the meeting of technical experts on the Biosafety Clearing-House referred to in the table at the end of decision EM-I/3, and reiterates its invitation to Parties and States to make contributions for the supplementary budget for biosafety to the Special Voluntary Trust Fund (BE) for Additional Voluntary Contributions in Support of Approved Activities for the biennium 1999-2000, as presented in the table at the end of decision EM-I/3;

4. Welcomes the generous offer made by the Government of France to host the first meeting of the Intergovernmental Committee fothe Cartagena Protocol on Biosafety from 11 to 15 December 2000 in Montpellier.

Annex

WORK PLAN OF THE INTERGOVERNMENTAL COMMITTEE FOR THE CARTAGENA PROTOCOL ON BIOSAFETY

A. Issues for consideration by the ICCP at its first meeting

1. Decision-making (Article 10, para. 7) Issue: Identification of basic elements for appropriate procedures and mechanisms to facilitate decision-making by Parties of import.

2. Information-sharing (Article 20, Article 19)

Issues:

Determination of needs of Parties

Overview of existing activities/systems and possibilities for cooperation

Design of data-input systems

Development of common formats for reporting, e.g., decisions, national legislations, points of contact, focal points, summaries of risk assessments, etc.

Development of operational systems, information-management policies and procedures for receiving and making information available, including quality-insurance procedures

Means to ensure confidentiality of information

Financial and technological resource requirements

Other issues (such as Article 5).

3. Capacity-building (Article 22, Article 28)

Issues:

Identification of the needs and involvement of Parties

Establishment and role of the roster of experts

Overview of completed activities in the field of biosafety (e.g., capacity-building workshop in Mexico)

Overview of existing programmes/projects/activities and possibilities for cooperation (e.g., UNEP activities and possible role)

Multilateral, regional and bilateral cooperation and the need for common understanding and harmonization

Involvement of the private sector

Elements of capacity-building with respect to risk assessment and management in accordance with Article 15, Article 16 and Annex III of the Protocol

Role of the Secretariat of the Convention

Financial and technological resource requirements

Other issues (such as Article 6)

4. Handling, transport, packaging and identification (Article 18)

Issues:

Overview of relevant international rules and standards pertaining to handling, transport, packaging and identification

Consideration of modalities for developing standards with regard to handling, transport, packaging and identification

5. Compliance (Article 34)

Issues:

Elements for a compliance regime

Options for a compliance regime

B. Issues for consideration by the ICCP at its second meeting

1. Liability and redress (Article 27)

Issue: Elaboration of a draft recommendation on the process for elaboration of international rules and procedures in the field of liability and redress for damage resulting from transboundary movements of living modified organisms, including, inter alia:

Review of existing relevant instruments

Identification of elements for liability and redress

2. Monitoring and reporting (Article 33)

Issue: Format and timing for reporting.

3. Secretariat (Article 31)

Issue: Development of a programme budget for the biennium following the entry into force of the Protocol.

4. Guidance to the financial mechanism (Article 28, para. 5, Article 22)

Issue: Elaboration of guidance for the financial mechanism.

5. Rules of procedure for the meeting of the Parties Issue: Consideration of rules of procedure.

6. Consideration of other issues necessary for effective implementation of the Protocol (e.g., Article 29, para. 4)

7. Elaboration of a draft provisional agenda for the first meeting of the Parties Items for continued consideration from the first meeting of the ICCP

8. Decision-making (Article 10, para. 7)

9. Information-sharing (Article 20)

10. Capacity-building (Article 22, Article 28, para. 28)

11 Handling, transport, packaging and identification (Article 18)

Issue: Modalities for a process for discussion on Article 18, paragraph 2 (a) by the first meeting of the Parties.

12. Compliance (Article 34).

4.7 United Nations Development Programme (UNDP)

The UNDP is the United Nations' global development network. It advocates for change and connects countries to knowledge, experience and resources to help people build a better life. UNDP is on the ground in 166 countries, working with them on their own solutions to global and national development challenges. As they develop local capacity, they draw on the people of UNDP and our wide range of partners.

4.7.1 UNDP and Environment and Energy

Energy and environment are essential for sustainable development. The poor are disproportionately affected by environmental degradation and lack of access to clean, affordable energy services. These issues are also global as climate change, loss of biodiversity and ozone layer depletion cannot be addressed by countries acting alone. UNDP helps countries strengthen their capacity to address these challenges at global, national and community levels, seeking out and sharing best practices, providing innovative policy advice and linking partners through pilot projects that help poor people build sustainable livelihoods.

4.7.2 Six Priority Areas of UNDP

UNDP's work on Environment and Energy is focused on six priority areas i.e.

- Frameworks and Strategies for Sustainable Development
- Effective Water Governance
- Access to Sustainable Energy Services
- Sustainable Land Management to Combat Desertification and Land Degradation
- Conservation and Sustainable use of Biodiversity
- National/Sectoral Policy and Planning to Control Emissions of ODS and POPs

4.7.3 Frameworks and Strategies for Sustainable Development

UNDP seeks to develop country capacity to manage the environment and natural resources; integrate environmental and energy dimensions into poverty reduction strategies and national development frameworks; and strengthen the role of communities and of women in promoting sustainable development.

4.7.4 Effective Water Governance

UNDP supports the sustainable use of marine, coastal and freshwater resources and improved access to water supply and sanitation services. This requires the appropriate local, national and regional water governance frameworks, and application of integrated water resources management approaches. UNDP also promotes cooperation in trans-boundary waters management.

4.7.5 Access to Sustainable Energy Services

UNDP supports energy activities to reduce poverty and achieve sustainable development objectives at the local, national and global levels. Our work is focused on strengthening national policy frameworks to support energy for poverty reduction; promoting energy services to support growth and equity with specific focus on the situation of women; promoting clean energy technologies to mitigate climate change; and increasing access to investment financing for sustainable energy, including through the Clean Development Mechanism. Activities in these areas complement and help integrate Global Environment Facility (GEF) programmes in the field of climate change and support sustainable livelihoods.

4.7.6 Sustainable Land Management to Combat Desertification and Land Degradation

Land degradation is one of the major causes of rural poverty, as well as one of its effects. UNDP works to break this cycle and reduce poverty through sustainable land management and by maintaining land-based ecosystem integrity, particularly in dry lands where the poorest, most vulnerable and marginalized people live. UNDP assists countries and communities in land governance, drought preparedness, reform of land tenure and promotion of innovative and alternative sustainable land practices and livelihoods. Special emphasis is given here to the situation of rural women. UNDP supports institutional and systemic capacity building to address desertification and land degradation of rural poverty reduction, through local, national and global multi-stakeholder dialogue and action. UNDP promotes the mainstreaming and integration of major environmental conventions to reduce land degradation, help land users adapt to climate change, and maintain services through ecosystem integrity.

4.7.7 Conservation and Sustainable use of Biodiversity

Through a close integration of GEF and core activities, UNDP helps countries and communities maintain and benefit from the biodiversity and ecosystem services that underpin human welfare and economic development, and provide the poor with food security, fuel, shelter, medicines and livelihoods as well as clean water, disease control, and reduced vulnerability to natural disasters. UNDP supports the sustainable management of agriculture, fisheries, forests and energy, and a pro-poor approach to conservation and protected areas, biotechnology and the development of viable, new markets for ecosystem services.

4.7.8 National Policy and Planning to Control Emissions of Ozone-Depleting Substances (ODS) and Persistent Organic Pollutants (POPs)

The Montreal Protocol and GEF programmes of UNDP support governments as they develop and strengthen national and sectoral strategies for the sustained reduction and elimination of ODS and POPs. Enterprises are assisted in maintaining their economic competitiveness through provision of best available alternative technologies and opportunities for capacity development.

4.7.9 United Nations Environment Programme (UNEP)

The UNEP coordinates United Nations environmental activities, assisting developing countries in implementing environmentally sound policies and practices. It was founded as a result of the United Nations Conference on the Human Environment in June 1972 and has its headquarters in Nairobi, Kenya. UNEP also has six regional offices and various country offices.

UNEP is the designated authority of the United Nations system in environmental issues at the global and regional level. Its mandate is to coordinate the development of environmental policy consensus by keeping the global environment under review and bringing emerging issues to the attention of governments and the international community for action. The mandate and objectives of UNEP emanate from United Nations General Assembly resolution 2997 (XXVII) of 15 December 1972 and subsequent amendments adopted at UNCED in 1992, the Nairobi Declaration on the Role and Mandate of UNEP, adopted at the Nineteenth Session of the UNEP Governing Council, and the Malmö Ministerial Declaration of 31 May 2000.

Its activities cover a wide range of issues regarding the atmosphere, marine and terrestrial ecosystems. It has played a significant role in developing international environmental conventions, promoting environmental science and information and illustrating the way those can work in conjunction with policy, working on the development and implementation of policy with national governments and regional institution and working in conjunction with environmental Non-Governmental Organizations (NGOs). UNEP has also been active in funding and implementing environmentally related development projects.

UNEP has aided in the development of guidelines and treaties on issues such as the international trade in potentially harmful chemicals, transboundary air pollution, and contamination of international waterways.

The World Meteorological Organization and the UNEP established the Intergovernmental Panel on Climate Change (IPCC) in 1988. UNEP is also one of several Implementing Agencies for the Global Environment Facility (GEF).

4.7.10 Modeling Human Impacts on Biodiversity: GLOBIO Model

The model GLOBIO is a tool to assess past, present and future human impact on biodiversity. As a policy tool, it is regularly applied in global, regional and national assessments. The GLOBIO model is the result of a collaboration between the Netherlands Environmental Assessment Agency (PBL), the UNEP World Conservation Monitoring Centre (UNEP-WCMC) and UNEP/GRID-Arendal.

UNEP-WCMC in collaboration with the International Cable Protection Committee and UNEP has prepared a new report which provides an objective, factual description of the sub-marine cable industry and the interaction of submarine telecommunications (which route 95% of all international communications traffic) with the marine environment. This important report seeks to focus and guide deliberations and decision making on the wise conservation and protection of the oceans in concert with their sustainable management and use.

On behalf of the CBD Executive Secretary, UNEP-WCMC has compiled and synthesized available scientific information on ocean fertilization and its observed and predicted impacts on marine biodiversity and habitats. The study will inform the review of the CBD marine and coastal programme of work in 2010.

4.7.11 Impacts of Ocean Acidification on Marine Biodiversity

UNEP-WCMC has provided technical support to the Secretariat of the Convention on Biological Diversity (CBD) to conduct a major study of more than 300 scientific literatures to synthesise the observed and predicted impacts of ocean acidification on marine biodiversity. The study, Scientific Synthesis of the Impacts of Ocean Acidification on Marine Biodiversity, describes an alarming picture of possible ecological scenarios and adverse impacts of ocean acidification for marine ecosystems, and highlights the direct link between climate change, ocean health and human well-being.

4.7.12 Mapping the Climate Change and Biodiversity Impacts of Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD)

An agreement in Copenhagen to fund reduced emissions from deforestation may generate multiple environmental and economic benefits if investments simultaneously target sites that are both carbon and biodiversity-rich. But the new report, published today in the journal Conservation Letters, also warns of challenges in countries such as Brazil and parts of East Africa unless safeguards are followed. This first global map-based analysis of the distribution of carbon and biodiversity indicates that governments face a series of choices on how best to maximize the benefits and minimize the challenges presented by a possible REDD deal at the UN climate convention.

4.7.13 Climate Change and Biodiversity Reports Launched in Copenhagen

UNEP-WCMC launched a series of reports on climate change and biodiversity at the Copenhagen Climate Change Conference (COP15). These included studies of how Reducing Emissions from Deforestation and Forest Degradation in developing countries (REDD) can deliver biodiversity and other co-benefits; detailed spatial analyses for several countries of the relationship between carbon stored in ecosystems, biodiversity and ecosystem services; an updated global map of carbon stored in terrestrial ecosystems; and reviews of the recent scientific literature on climate change and biodiversity, produced to support the work of the CBD Ad Hoc Technical Expert Group on Biodiversity and Climate Change.

UNEP-WCMC has been providing technical support to the work of the Convention on Biological Diversity (CBD) on biodiversity and climate change.

4.7.14 Comparative Studies of Environmental Law (Bangladesh and International)

As a global partner Bangladesh signed the Biodiversity Conversion at Rio in 1992. There is a focus on biodiversity in the forest and environment policy. However, a separate policy on biodiversity is yet to be formulated and until then various departments of the government will be working for conservation of biodiversity within the existing rules and regulations. Some of the important rules are: the Protection and Conservation of Fish Act and Rules, the Marine Fisheries Ordinance, Wildlife Preservation Act, Forest Act, the Environment Conservation Act and Rules, *etc*.

Under the Bangladesh Wildlife Preservation Act, 1974 three categories of protected areas have been established as national parks and wildlife sanctuaries. With an aim to conserve the biodiversity, conserve and develop natural environment and eco-tourism and to develop education and research, the Government of Bangladesh has declared 17 protected areas constituting about 245 thousands hectares of forest in different parts of the country. Moreover, the Government of Bangladesh has declared 8 areas i.e. Cox's Bazar, Teknaf Sea Beach, Saint Martin's Island, Sonadia Island, Sundarban Reserve Forest, Gulshan-Baridhara Lake, Hakaluki Haor, Tanguar Haor and Marjat Baor as Ecologically Critical Area (ECA) under Environmental Conservation Act, 1995.

According to Ramsar Convention, the government has undertaken major development activities to conserve the biodiversities of wetlands including Tanguar Haor. The department of Environment with the assistance of Global Environmental Facilities (GEF) and UNDP is implementing a project titled 'Coastal and Wetland Biodiversity Management at Cox's Bazar and Hakaluki Haor' for conservation, management and sustainable development of coastal and wetland biodiversity at Cox's Bazar, Saint Martin's Island and Hakaluki Haor.

Besides, a part of the Sundarbans and the Tanjuar Haor have been designated as Ramsar sites in the country. In addition, considering the importance of protecting biological diversity of the world, UNESCO has declared the Sundarbans, the largest single mangrove forest, as World Heritage Site on 6 December 1997.

4.8 Conclusion

Eventually it is drawn from the studies discussed above that to save the global environment and biodiversity different types of efforts were taken in different times. At first the relationship between economic development and environmental degradation was placed on the international agenda in 1972, at the UN Conference on the Human Environment, held in Stockholm. In 1992, The Earth Summit was held in Re De Janeiro of Brazil in which a number of agreement were signed and many steps were taken for having a change of our traditional development in environmental sectors.

In order to tackle Global Warming, United Nations General Assembly took up this issue of Climate Change and adopted the resolution "Protection of Global Climate for Present and Future Generations of Mankind".

Though Bangladesh is also a member of global community nevertheless as its position Bangladesh could not produce their concerned issues related to the global environmental crisis. Environmental crisis is a burning global issue whereas Bangladeshi laws are concerned only about on local issues.

Chapter 5
Impact of Environmental Laws on Biodiversity Conservation

5.1 Introduction

Concern people of the world are conscious to save the Environment. As a part Bangladesh is also so serious to maintain the Environmental Laws on Biodiversity Conservation like the others country of this world. To keep the Environment in balance there are many rules and regulations regarding Environmental conservation in the world. Like the others country Bangladesh has also various Laws on Bio-diversity conservation. But lack of proper execution of such of Laws and careless of related institution regarding Laws execution, many flora and fauna are extinct from the Environment. The effect of implementation and violation of Laws are discussed in details bellow.

5.2 Violation of Environmental Laws

Due to the increasing demand of daily amenities, the people have been more opportunistic to abuse environment for their own benefit. This will entail a judicial approach that can sue aggressive people or organization attempted to violate the natural settings. So far, the legislative advancement regarding this issue has been reckoning. But, at the same time, unscrupulous section somehow has been able to evade.

Since its attention towards protection of environment, some litigation has been placed. This proves that the violation has been braved. In another word, this can be explained as the increasing trend that the people are ever more hostile to environment. The latter Para is to show the increasing trend of litigation so as to provide the evidence of violation.

In 1994, a writ petition was first taken before the High Court by a national non-governmental organization called Bangladesh Environmental Lawyers Association (BELA) on behalf of the people of a locality where a disputed development action was being implemented. The petition was at first rejected by the court on the ground of standing of the organization. An appeal was preferred from that rejection where the core

question was whether groups like BELA with dedicated arid sincere record of activism can claim to have acquired sufficient interest to seek judicial redress against anarchy in its own field of action. The question was vital as it was a constitutional requirement under Article 102 that it is only "a person aggrieved" who can file petitions for enforcement of fundamental rights. Being responded by the Supreme Court in the positive this became the turning point in the history of Bangladesh.

5.2.1 Case Reference on Ship Breaking

Bangladesh Environmental Lawyers Association (BELA) v. Bangladesh and others Writ Petition No. 2911 of 2003 (Ship Breaking to be regulated by Law)-

Most recently BELA has also filed a petition on the 19" of April, 2003 before the Honorable High Court division to check pollution of coastal/ marine ecosystem caused by the disposal of hazardous ship wastes as taking place in the ship breaking operation in Sitakunda of Chittagong. Seeking relief against violation of legal provisions on environment and labour protection, the petition has been filed, amongst others, the Secretaries, Ministry of Shipping, Industries and Commerce, Labour and Employment, Environment and Forest. The Director General, Department of Environment, Fire Service and Civil Defense, Chief Inspector of Factories and Establishments, Department of Explosives, Collector of Customs, Chittagong, Mercantile Marine Department and the President of Bangladesh Ship Breakers Association are amongst the other respondents. According to the petitioners; the available records suggest that no ship-breaking agencies have environmental clearance despite the clear requirement to have such clearance as a hazardous industry/factory. Moreover, the persistent violation of labour related laws in the ship breaking agencies have resulted in few major explosions in the past three years. Upon hearing the petitioner, the Division Bench of the High Court Division comprising Mr. Justice M M. Ruhul Amin and Mr. Justice Mohammad Bazlur Rahman has issued a Rule Nisi calling upon the respondents to show cause why they should not be directed to ensure that ship breaking operation is undertaken only after obtaining certificate of environmental clearance as required under section 12 of the Environment Conservation Act, 1995 and on adopting detailed and appropriate safety and labour welfare measures as required under the Factories Act, 1965.

5.3 Violation of River Law

In 1994 BELA filed this Writ Petition seeking relief against indiscriminate pollution of air, water, soil and the environment by 903 industries of 14 sectors identified as polluters by the Ministry of Local Government, Rural Development and Cooperatives (LGRDC) vide Gazette notification dated 7 August 1986. The 14 sectors include Tanneries, Paper and Pulp, Sugar Mills, Distilleries, Iron and Steel, Fertilizer, Insecticide and Pesticide Industries, Chemical Industries, Cement, Pharmaceuticals, Textile, Rubber and Plastic, Tyre and Tube and Jute.

The Petitioner pleaded that the ecological system of the country more particularly the air and water including the major rivers (Buriganga, Surma, Karnaphuli and so on) are being severely affected by the identified 903 industries and that no affirmative action has been taken in furtherance of the decisions of the Gazette dated 7" August, 1986. Rather the number of polluting industries has multiplied as the recent list prepared by the DoE shows that the number of polluting industries have raised up to 1176. The Court earlier issued Rule Nisi to the respondents including the LGRDC, Ministry of Environment and Forest, Ministry of Industries and Department of Environment to show cause as to why they should be directed to implement the decisions of the Government dated 5 June, 1986 which was published in the official Gazette. After hearing the Petitioner, the Rule has been made absolute today and the DG, DoE has been directed to "Report to this Court after six months by furnishing concerned affidavit showing that compliance of this Order of this Court". To ensure implementation of the Court directions, the Hon'ble High Court further held that "It will be imperative on the part of the Director General to take penal action against such department for persons who are responsible for not implementing the letter of the Environment Conservation Act, 1995."

5.3.1 Case Reference on Uttara Lake Fill-up

Dr. Mohiuddin Farooque *vs.* Bangladesh & others Writ Petition No. 948/1997 (Uttara Lake Fill-up)-

A division Bench of the High Court Division issued an injunction of the filling up of Uttara Lake for housing purposes. The injunction was issued on an application of Dr. Mohiuddin Farooque, Secretary General, BELA upon the Secretary, Ministry of Housing

and Public Works, Chairman, Rajdhani Unnayan Kartripakhya (RAJUK) and DG, DoE. The petition was filed on an appeal from the local residents of Uttara, who accused RAJUK of creating an environmental hazard in the area by filling up part of 'the lake in violation of the original Master Plan of Uttara. The injunction would remain effective till disposal of the case.

Dr. Mohiuddin Farooque v. Bangladesh & others Writ Petition No. 7422/1997 (Gulshan Lake Fill-up)-

A division bench of the High Court Division issued a Rule in a petition filed in 1997 against implementation of an agreement called the "Banani, Gulshan, Baridhara Lake Development Project Agreement" signed between RAJUK and Indus Valley Investment Pvt. Ltd. to undertake a huge construction in the said areas, defying and violating the constitutional and legal requirements. The Court directed them to show cause as to why "the agreement and the subsequent agreements to lease out a total area of 220 acres of public land should not be declared to have been entered/undertaken without lawful authority in violation of law and the constitution against public interest and as such be declared null and void and of no legal effect."

Biplob Kumar Roy v. Bangladesh and others Writ Petition No. 1840 of 1999 (Nabaganga River)-

A Rule Nisi was issued upon the Deputy Commissioner, Narail District for unlawfully leasing out part of the River Nabogonga having its flow through Rajpur to Jaipur Ghat. The rule came as a result of the Petition No. 1840 of 1999 filed by BELA and one member of the local fisherman community, alleged that such leasing violated the notification of the Ministry of Land dated 5 September '95 prohibiting leasing of open fisheries for protecting the rights of the poor fishermen community and ensuring their livelihood. The rule required to show cause as to *"why the leasing out of the part of the river Naboganga snail not be declared to have been made in defiance of legal and constitutional obligations and against public interest, is of no legal effect and without any lawful authority".*

Bangladesh Environment Lawyers Association (BELA) *vs* Bangladesh and others Contempt Petition No. 33 of 2001 (Arising out of Writ Petition No. 4098 of 1999) (Buriganga Encroachment)

One contempt petition has been filed before the Hon'ble High Court Division to wilful disregard to the order of the High Court Division relating to the Buriganga Encroachment in this petition the division bench calling upon the respondents contemnors to show cause as to why they should not be prosecuted for committing contempt of court in my some meeting the report in compliance to the order dated 18 January 2000, 23 April 2000 and 19 July, 2000 passed in writ petition No. 4098 of 1999 and take appropriate action to punish the respondent contemnors according to law and / or such other or further order passed as to this Court may seem fit and proper.

Md. Shahjahan Mondol and others *vs.* Executive Engineer CPP Division Water Development Board Tangail and others Civil Revision no. 2873 of 2001 (FAP)

A single bench presiding by Mr. Justice Md. Abdul Wahhab Miah the court issued rule calling upon their opposite parties to show cause as to why the order dated 25.2.2001 passed by the Sub-Ordinate Judge Arthorin Adalat Tangail in miscellaneous appeal no. 78 of 1999 setting aside the order maintaining a status quo dated 4-11-99 passed by the Senior Assistant Judge, Tangail in Title Suit No. 113'of 1999 should not be set aside and or passed such other or further order or orders as to this court may seem fit and proper. Pending hearing of the rule Parties are directed to maintain status quo in respect of possession of the suit property.

Bangladesh Environmental Lawyers Association (BELA) and Thengamara Mohila Sabuj Sangha (TMSS) *vs* Bangladesh and others Writ Petition No. 4244/04 (Illegal Sand Extraction from River Korota)-

The High Court in August, 2004 issued a rule nisi on the Government and the concerned individuals to show cause why they should not be directed to prevent the illegal sand extraction from the river Korota of Mouzas Thengamara, Shakharia, Bonomalipara and the surrounding areas of Bogra.

The rule nisi was issued on a writ petition filed by BELA and Thengaramara Mohila Sabuj Sangha (TMSS). The petitioners sought judicial intervention to prevent illegal sand extraction from the river Korotoa at the Thengamara, Shakharia and Bonomalipara Mouzas and the surrounding areas of Bogra and also to compensate the affected villagers. The Court further stayed illegal sand extraction for a period of six months.

A division bench of HC comprising the Justice Mohammad Abdul Wahab Mia and Justice Ziriat Ara issued the orders upon the secretaries, Ministries of Land, Environment & Forest, Water Resources, DG of Department of Environment (DoE), Deputy Director of DoE at Rajshahi and Deputy Commissioner of Bogra.

5.4 Violation of Biodiversity Law

A writ petition was filed with legal assistance from Bangladesh Environmental Lawyers Association (BELA) by Mr. Sharif Nurul Ambia, Joint General Secretary of Jatiya Samajtantric Dal (JSD).

The Petition was moved by the Secretary General of BELA, Dr. Mohiuddin Farooque submitting that the DCC has undertaken the construction of the multi-storied building at the site earmarked for public car park in the RAJUK Master Plan unlawfully and without the latter's approval and hence liable to be demolished. It was further submitted that the construction was continuing defying DoE's finding that the said building would create a disruption to the environment of the area and the neighborhood depriving them the right to life, body and healthy environment against hazardous pollution and obstruction to air and light as being endangered by the unauthorized construction by the Respondents.

Upon hearing the petitioner, the Court stayed the said construction till disposal of suit. The rule was ultimately disposed of against which an appeal is pending before the Appellate Division.

Nijera Kori *vs.* Bangladesh & others Writ Petition No. 1162/1998 (Allotment of Land for Shrimp Cultivation)-

The petition was filed against allotment of Government owned *Khas* Land to Shrimp Cultivators in Sudharam, P.S. of Noakhali District in contravention of the provision of the Land Management Manual, 1991 and Articles 15, 19, 31 and 32 of the Constitution depriving thereby the landless people. The Court on two occasions restrained the respondents from disturbing the peaceful possession of the landless families.

The matter is now pending for hearing.

Bangladesh Environmental Lawyers Association (BELA) *vs* Bangladesh and others Writ Petition No. 1430 of 2003 (Tannery case)-

To relocate Tannery Units from Hazaribagh the High court has issued a Rule Nisi on 3 March , 2003.A division bench of the court comprising of Mr. justice M.A Aziz and Mr. Justice Nazrul Islam Chowdhury has called upon the seven government agencies and two tannery associations as respondents namely; the secretaries of the Ministries of Industries and Commerce, Environment and Forest, the Director General and the Director of DoE ,member of Planning Commission Chairmen of RAJUK BSCIC and Tanners Association and BFLLFEA. They were asked to show cause why they should not be directed to relocate within 18 months from date the tannery units from Hazaribagh area of the city to suitable location as contemplated in the Master Plan prepared under the Town improvement Act 1953 and ensure that adequate pollution fighting devices are developed in the new location /site as required under the Environment Conservation Act, 1995 and the Factories Act, 1965 and the rules made there under Pending hearing of the Rule, the respondents are also directed to apprise the Court regarding the process of relocation of Tannery Units and submit a report in this regard to the Court within 6 months from date. The rule is made returnable within 4 weeks. The matter is now pending for hearing.

5.5 Violation of Fishery Related Cases

As a partner of the Community based Fishery Management Program (CBFM-phase II), BELA is assisting the other partner NGOs/department of fisheries/Local Management Committees of CBFM to defend cases to protect the rights of the beneficiary fishermen. Ten such cases are pending before the sub ordinate courts of Rangpur, Kishoregonj, B'Baria and Narail districts. The suits relate to leasing out of public fisheries to poor fishermen for conservation-oriented management (known as biological management) as opposed to revenue management in favor of individual lease-holder.

The suit numbers are:

a. Title Suit No. 24/2002
b. Appeal No. 30 of 1999 and Mis. case No. 19 of 2002
c. Complainant Register Case No. 02 of 2003
d. Title Appeal No. 142 of 2000
e. Title Suit No. 161 of 2002
f. Other Suit No. 22 of 2003
g. Others Suit No. 27 of 2003
h. Others Appeal No. 23 of 2002
i. Title Suit No. 84 of 2001
j. Title suit no. 66 of 2002.

Bangladesh Environmental Lawyers Association (BELA) v. Bangladesh & others Writ Petition no. 2224 of 2004 (Protection and Conservation of Sunderbans)-

A petition (Writ Petition no. 2224 of 2004) was moved on 2 May 2004 before the High Court Division by BELA seeking special protective measures to protect and conserve the 9285.15sq kilometers of Sunderbans as an Ecologically Critical Area (ECA). In the petition filed by BELA relief was sought against the Secretaries, Ministry of Land, Ministry of Environment & Forest (MoEF), Department of Environment (DoE), Chief Conservator of Forest, the Divisional Forest officer, Bagerhat, Divisional commissioner, Khulna, the Deputy Commissioner, Bagerhat, the Upazila Nirbahi officer, Bagerhat.

The petition stated that the land area in question is being grabbed by the Ministry of Land for unlawfully implementing its project despite severe protests even from the Forest Department. It was also stated in the petition that the government vide a gazette notification dated 30 August, 1999 has declared 10 (ten) kilometres area around the reserved forest of Sunderbans as Ecologically Critical Area (ECA) and has prohibited in that area such activities that can threaten the forest and habitat of wild animals. The plan of the Ministry of Land to implement its project is in fact within the limits of the ECA.

Upon hearing the petitioner, the Division Bench of the High Court Division comprising Mr. Justice Shah Abu Nairn Mominur Rahman and Mr. Justice Jubayer Rahman Chowdhury has issued a Rule Nisi calling upon the government to show cause as to why the setting up and implementation of Adrasha Gram project should not be declared to have been undertaken without any legal effect. Pending hearing of the Rule the Court has also stayed implementation of the project and issued an injunction restraining the Secretary, Ministry of Land, Divisional Commissioner, DC and UNO of Bagerhat district from carrying out any activities towards settlement of any person in the ECA of the Sunderbans.

Bangladesh Environmental Lawyers Association (BELA) and other v. Bangladesh and others Writ Petition No. 7465 of 2006 (Dumping Waste in Savar Amin Bazar by DCC)-

In a writ petition filed on 6 August, 2006 by BELA, challenging the dumping of waste by the DCC in the flood flow zone of Konda and Baliarpur mouzas of Savar, Amin Bazar, a division bench of the Supreme Court comprising Mr. Justice Syed Mohammad Dusthagir

Hossain and Mr. Justice Maranon Rahaman has restrained the Mayor, DCC and the Project Leader of *Dhaka Mohanogoreer Bibhinno Elakar Obokatthamo o Paribesh Unnayan Prokolpa* of DCC.

The case has been filed against, amongst others, the Secretaries, Ministry of Land, Ministry of Local Government and Rural Development and Cooperatives, Ministry of Environment and Forest, Ministry of Housing and Public Works, the Mayor, Dhaka City Corporation, the Chairman, Rajdhani Unnayan Kartripakkha, RAJUK, the Director General, Department of Environment (DoE).

Bangladesh Environmental Lawyers Association (BELA) *vs* Bangladesh and others Writ Petition No. 3475 of 2003 (Protection and Maintenance of Parks and Playgrounds of Dhaka)-

A petition was moved on 11 May, 2003 before the High Court Division by BELA seeking proper maintenance and protection of 10 playgrounds and 61 parks of the City.

This petition was filed against the Mayor, Dhaka City Corporation (DCC), Chief Engineer, Public Works Department (PWD) and Chairman. RAJUK the petitioner prayed for direction to (i) ensure proper maintenance and protection of open spaces of the City as required under the Town Improvement Act, 1953, the Dhaka City Corporation Ordinance, 1983 and the Open Space Protection Act, 2000, (ii) complete the process of demarcation of all open spaces, (iii) develop, time bound plan for development and maintenance of the open spaces as required under the Town Improvement Act, 1953 and the Dhaka City Corporation Ordinance, 1983, and (iv) implement the said plan within such time as may be fixed by the Court.

5.6 Violation of Forest Law

Dr. Mohiuddin Farooque v. Bangladesh & others Writ Petition No. 1252/1997 (Unregulated Operation of Brick Field)-

The indiscriminate operation of 19 brickfields in Senbag of Noakhali District in violation of applicable legal provisions and circular was brought to the notice of the High Court through the above petition. The petition filed by BELA on behalf of a local group called Senbag Thana Pollution Free Environment Committee accused the local administration for being indifferent towards the environmental havoc created by the brick furnaces. The

management of the brickfields were not conducting their business with due regard to the legal provisions mandating in favor of sound environment and health state. Moreover, leasing agricultural land to brick fields in violation of existing land management laws and manual resulted in a tremendous pressure on the available stock of agriculture land, as after a given period the lands do not remain fit for agricultural purposes.

With development of public demand and opportunity peoples start the violation of the environmental laws for their own benefits. From the above case studies it is found that the peoples show vast tendency to violate these laws in different times. Though there are many laws are enacted with a view to stopping the violation of environmental law. Some organizations are also trying to stop these violations beside the government efforts.

5.7 Abuse of Law by the Authority

5.7.1 Case Study on: Effects of Exotic Plantation and Its Implication on Biological Diversity: A Case Study on Modhupur Forest

Introduction

Throughout the world ecosystems today are threatened with destruction at a rate rarely seen in history. As a result depletion of biodiversity and climate change has gained the foremost importance in the current world order.

According to CBD, "Biological Diversity" means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; it includes diversity within species between species, and of ecosystems (Article II, CBD, 1992).

But unfortunately, many plant and animal species on Earth are facing severe threats to their survival and are disappearing at alarming rates. And human actions are the cause behind this biological degradation.

Bangladesh is no different story. Here environmental degradation is also severe. But this report will only focus on the Modhupur forest which is one of the oldest forests in this region *i.e.* last deciduous forest in Bangladesh. It was a vast resource of flora, fauna and natural resources. The ecosystem of the forest was very old. But from late 1980's, there have been implemented a number of government and foreign funded projects which cause

felling of old diversified species of natural trees and replace them with monotonic exotic trees like rubber, acacia, eucalyptus, mahogany *etc*. which was planted for short term economic benefits. But these practices have adverse effects on biodiversity and ecosystem resulted in destroying several species of flora and fauna for good. As a result, the forest has been shrunken and the livelihood of people depend on forest has also been affected.

Objective

Objective of this report is to examine how natural forest has come into attack in the name of Government development effort in Modhupur forest and the implications of exotic plantation on the biological diversity of this forest region.

Methodology

The assignment is based on review of different books, research papers, newspaper reports on the subjected issue along with field visit and discussion with the stakeholders.

About Modhupur Forest (Map 6.1)

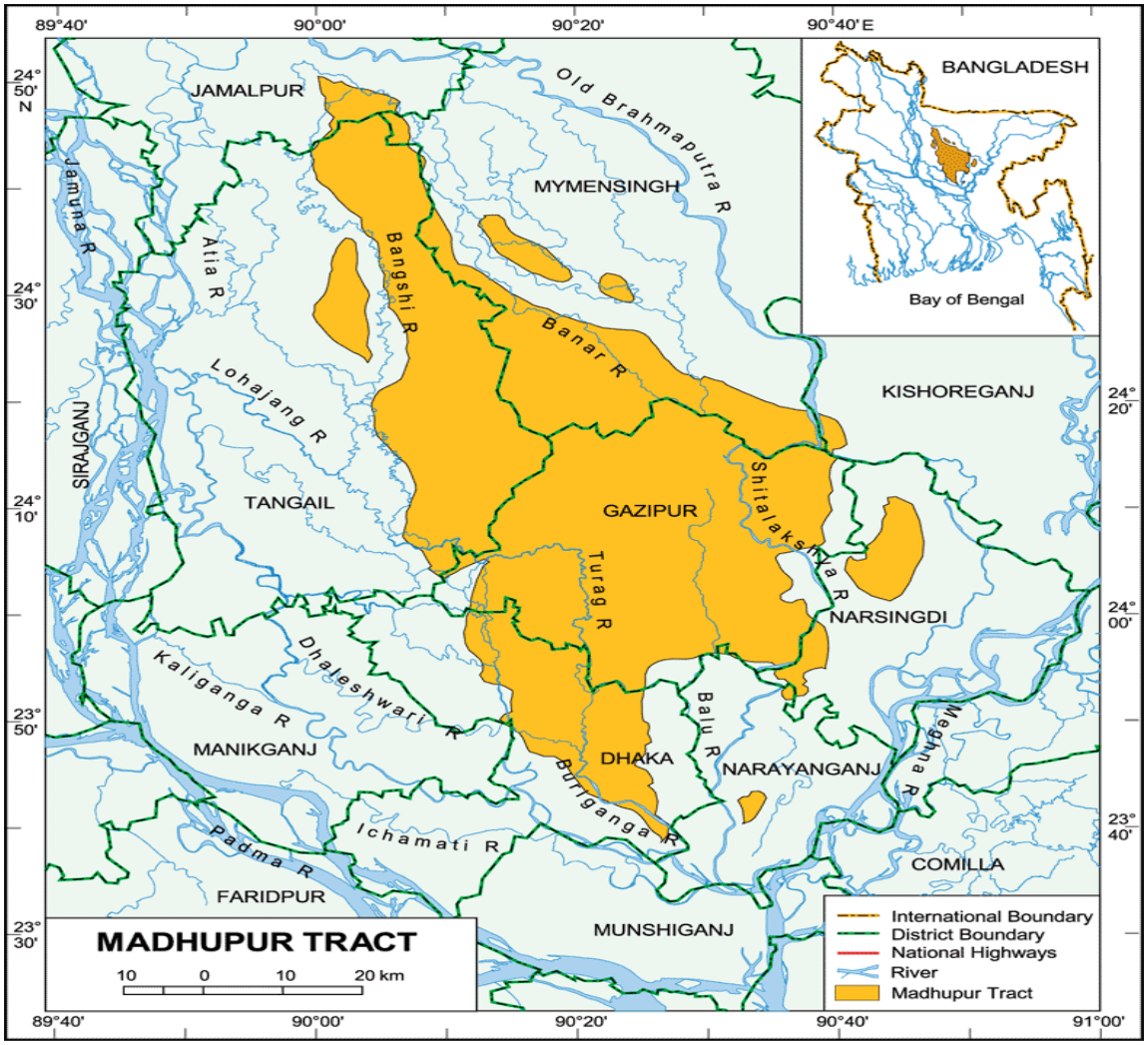
The forest land in Bangladesh is about 2.52 mil hectares or 17.4 percent of the total land area. Of this area, 1.52 mil hectares are managed by the Forest Department, 0.73 mil hectares are under the control of the District Administration mainly located in Chittagong Hill Tracts and an additional 0.27 mil hectares are owned by private parties. Apparently, the area of protected wilderness devoted to biodiversity conservation as a percentage of the total forest area is also favourable in comparison to world standard; it is 7 percent in Bangladesh while the global average is 10 percent. The forest types that exist in Bangladesh are Tropical Wet-evergreen Forests, Tropical Semi-evergreen Forests (Chittagong, Chittagong Hill Tracts and Sylhet), Moist Deciduous Forests (Dhaka, Tangail and Mymensingh), Mangrove (Sundarbans) and Freshwater Wetland Forests (Sylhet and Mymensingh). The main concern remains, however, as to how far these forest areas are still stocked with trees where scope for skepticism prevails. The forestry sector today contributes about 4% of Bangladesh’s GDP.

Among the different types of forests that exist in Bangladesh the Modhupur forest stands out for its uniqueness. This forest is valuable in ecological aspects as it's the country's last remaining patches of natural forest. If we cannot conserve this, we'll lose a unique biodiversity system. Modhupur Tract is a large upland area in the central part of Bangladesh. The southern part of this tract is known in Bangla as Bhawal Garh and the

northern part as Modhupur Garh. Geologically it is a terrace from one to ten metres above the adjacent floodplains. Though in its present form it is of Pleistocene age its origin may be in the late Miocene, when the bengal basin was being filled in rapidly.

The total extent of this Tract is 4,244 sq km. Unlike the barind tract it is largely in one piece, with seven small outliers. The main section stretches from just south of Jamalpur in the north, to Fatullah of Narayanganj, in the south. Most of Dhaka City is on this Tract. Of the seven outliers four are in the east and three in the north. All of them seem to have been separated atleast superficially, by faults. This part of Bangladesh has been uplifted several times, resulting in numerous longitudinal faults. The most prominent of these are along the western side, where they can be clearly seen at Mirpur (Dhaka City) and near Ghatail and Modhupur further north. Long fault traces are also extant on the eastern side. The climate of the Tract varies slightly from north to south, the northern reaches being much cooler in winter. Average temperatures vary from 28 to 32°C in summer, falling to 20°C in winter, with extreme lows of 10°C. Rainfall ranges between 1,000mm and 1,500mm annually. Severe storms are unusual but tornadoes have struck the southern areas.

The soils of the Tract have developed largely on Modhupur clays; which are nutrient poor and somewhat acidic. They are red or brown in colour. In most places the changes from the floodplains to the Tract is quite sharp, but in some places the floodplain soils overlie the gently inclining edges.



Map 5.1
Map of Modhupur Forest Area

The Modhupur Tract is extensively dissected, with narrow or broad valleys extending deep into the level landscape and the drainage pattern is clearly dendritic. The higher level lands are known as “chala” and the valleys are called “baid”. The valleys are cultivated with boro rice in the dry season by impounding the streams for irrigation. At this time the fields are dry in the uplands except where cultivated with sugarcane. Many of chala are well known for their jackfruit gardens. Large quantities of jackfruit are shipped out to other parts of the country from April to June. Some areas in the south, such as Kaliakair and Savar are also known for their production of mango, Bengal Olive, Pomelo and Star Apple, Pineapples, mainly Giant Kew variety, are grown extensively in Modhupur thana in the north.

Exotic Plantation in Modhupur Forest and Its Effects on Biological Diversity

Exotic species are those which are not native to an area. They can arrive there via trade, transport, travel or tourism, which have all increased hugely in recent years because of globalization. These species are harmful to native biodiversity in a number of ways, for example, as competitors, predators, parasites, or by spreading disease. IAS may also cause economic or environmental damage, or adversely affect human health. They are one of the greatest threats to biodiversity.

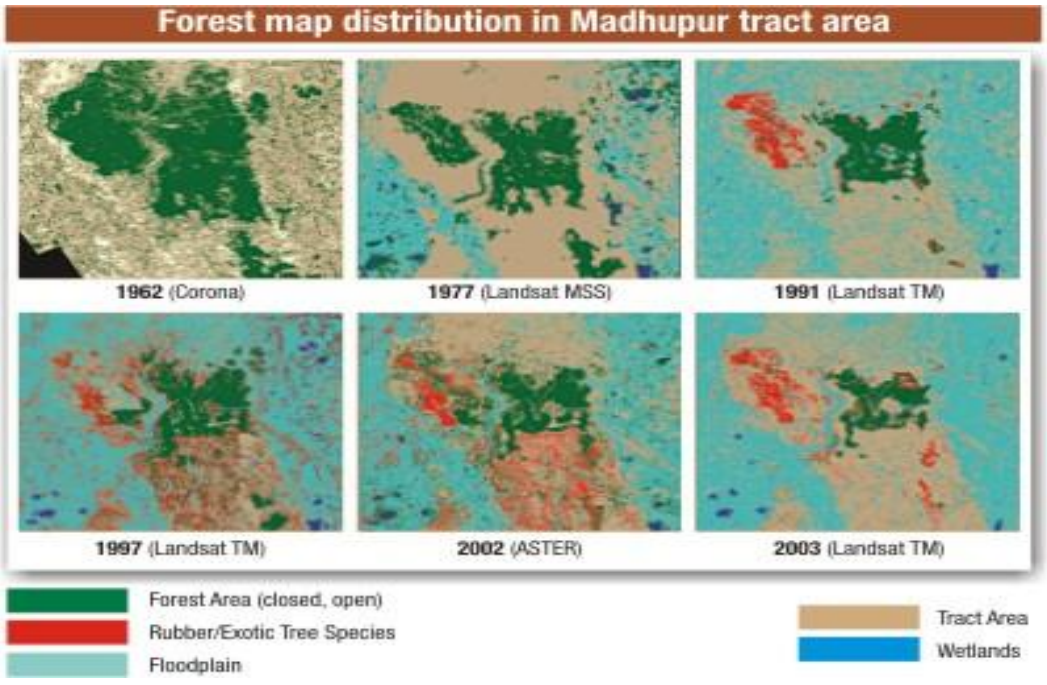
The Department of Forest is apparently depleting the Modhupur Sal Forest through implementation of different donor-funded aforestation projects, which mainly plant exotic trees of commercial value. The majority of the donor-funded projects in the past or the projects the government and development partners plan to implement shortly are about planting alien species of wood trees or constructing infrastructures inside the national park area of the forest. The forest department has been implementing donor-funded tree plantation projects in the forestland in different names since 1984. These projects actually encouraged the officials to strip off natural trees and plant alien species including acacia, eucalyptus, goran, gamari and rubber. Instead of reviving the natural forest, the forest department shows its keenness to plant alien species like acacia, rubber, mahogany and eucalyptus in Modhupur as per the condition of the projects.

Though land settlement and illegal logging are the major problems of Modhupur forest, the government never took any effective measures to rehabilitate the forest dwellers and properly manage the natural forest. Without addressing the major issues, the forest department started different wood plantation projects with a fund of the Asian Development Bank (ADB) in participation of local people. As the indigenous Garos were unwilling to take part, the department encouraged the Bangla-speaking people to resettle in the forestland. All projects and sub-projects namely agro-forestry, woodlots, institutional planting, strip planting, social forestry, national park project and eco-park ultimately resulted in destruction of the natural forest, resettlement and loan burden on the government. In 1987-1988 the government took a major land use decision about the Modhupur forest converting a vast patch of forestland into a rubber garden. Many such programs were later taken there and in each and every case exotic species were introduced in more and more areas. The forest officials were even allegedly involved in clearing natural species just to plant alien acacia so that they can show expenses on papers and sell the logged trees of the natural forest.

Impact on the Natural Forest and the Indigenous People (Map 6.2)

Most of this Tract was used to be covered by forests as recently as fifty years ago and Sal (*Shorea robusta*) was the dominant species. Due to illegal deforestation only about 600 sq km of forest remains and new woodlands planted with exotic species such as Akashi (*Acacia auriculiformis*) and eucalyptus (*Eucalyptus camaldulensis*) have transformed the ecosystem in many areas. Dr Tawhidul Islam of Jahangirnagar University studied the Modhupur forest during his doctoral thesis in Durham University, UK in 2002-2006 under Commonwealth Scholarship and witnessed sad episodes of deforestation. Dr. Islam analysed a series of satellite images taken in between 1963 to 2003 and detected how the government officials cleared the forest and let others do it. He mentions in the summary of his thesis that remote sensing techniques have shown quality degradation of the forest, signs of areas cleared for air force firing range and social forestry, conversion of forestland into rubber plantation, evidence of engulfing forests with settlement expansion, and indications of the influence of infrastructure.

His study reveals that more than 85 percent of the Modhupur forest has been cleared in last 40 years. Whatever remains, in most of the areas the age of sal forest is not more than 10 to 15 years. Within the defined study area in Modhupur the forest coverage reduced from 3,826 hectares in 1962 to 3,573 hectares in 1977, 1,801 hectares in 1997, and only 594 hectares in 2003.



www.google.com

Map 5.2
Forest area are Decrising day by day for the Anthropogenic Activities

Map 6.2 A comparison of satellite images of 1962 and 2003 clearly shows 85 percent greenery of Modhupur has disappeared in last 40 years. Now noise of vehicles and bombings and shootings of the armed forces overwhelm the chirping of birds.

One effect has been the reduction of bird species and numbers. It has also reduced the extraction of fuel by local villagers. Due to these and other detrimental effects, the Forest Department is considering changing the species composition. Two areas where some of the original forest remains are the Modhupur National Park in the north and the Bhawal National Park in the south. These parks were expected to protect the natural ecosystems.

However illegal extraction and poaching of wildlife has seriously reduced their potential. Two centuries ago elephant and rhinoceros have been reported in these forests but became extinct in the late nineteenth century. Tigers and leopards were numerous, but tigers dwindled in the early twentieth century and extinct fifty years ago. Leopards are feared to be close to extinction. The Leopard-Cat, Fishing-Cat, Jungle Cat and small Indian Civet are still to be found. The Peacock was at one time quite plentiful but became extinct thirty years ago.

Two tribal people, the Koch and the Mandi (garo), who are dependent on these forests, live in the Modhupur Tract. The Kochs are among the earliest people of Bangladesh, while the Mande have their main centre of dispersal in the Garo Hills in India. The Bengali-speaking people, who used to live along the fringes of the extensive forests, have entered in large numbers and cleared most of the forests. In the past thirty years the landscape and ecosystems of most of the Tract has changed drastically. Bengalis has developed stable agro-horticultural systems in the west, from Savar to Kaliakair. These areas are still very productive, especially of fruits, but are now threatened by the inexorable expansion of Dhaka City. Urbanisation is a relatively new phenomenon in this Tract. In ancient times the greater part of these uplands seems to have been forested. Only in the south, where the Tract bordered by the buriganga river, did urban centres flourish, as at Savar and Dhaka, both of which may have been founded two thousand years ago.

At present the enormous expansion of Dhaka City is the most conspicuous feature of the Modhupur Tract. The growth of the city has given to numerous small urban areas, which will in time be absorbed into the expanding city. The flood-free uplands have attracted

many Government institutions. The earliest was the Manipur Agricultural Farm, which is now an urban area in the centre of Dhaka City. The experimental farms were removed further north to Gazipur, where the Bangladesh Agriculture Research Institute (BARI), Bangladesh Rice Research Institute (BRRI), Bangladesh National University, Bangladesh Open University, Bangladesh Citrus Research Institute, Bangabandhu Agricultural University, *etc*. are situated. Further north the Cotton Research Institute has extensive grounds, where seed cotton is produced. The flood free nature of these lands has also attracted industrial growth, and new factories line the road from Dhaka to Mymensingh. Moreover the government has set up an export processing zone at Ashulia in Savar upazila which is continually expanding. Further west important institutions are Jahangirnagar University and Bangladesh Pulic Administration Training Centre with extensive campus. Closely is the National Memorial Monument (Jatiya Smriti Soudha).

Talking with different experts and local people it is known that although severely depleted, the remaining patches of the sal forest still hold a good number of unique birds, reptiles, insects, plants and animals that are found only in a deciduous forest like this.

Findings in Field Visit to Modhupur Forest

On October 23, 2009 the team comprising the members of assignment submitter visited Modhupur forest. The visit was one day stay in the forest (areas *Jalachatra*, telki, Rasulpur) with discussion with local people including people of Garo community, rickshaw/van pullers, and shopkeepers. The findings of discussion with Garo community as perceived by the team are as follow:

Garo Community

1. They are Dissatisfied with Government Projects of Exotic Plantation.
2. People of Garo Community are Transforming their Profession from Forest based Gatherers to Common Professions like Rickshaw Pulling, Shop Keeping, *etc*.
3. Many people of Garo Community have been Migrated to Different Places of Country for the sake of Livelihood Sustenance.
4. There is no Properly Documented Land Record System and Land Ownership is based on *de facto* Land Ownership System.
5. Repression against them for Protesting Projects like Eco Park (killing of Choles Ritchil,) created grievance to them.

6. There is Working a Religious Organization which Convincing Non-Muslim Garo People to be Convert to Muslim with Material Benefit. But one Religious Leader of the Organization termed it Resettlement plan for socially displaced people for religion convert.

The findings of discussion with Bengali community people (Rickshaw/van puller) as perceived by the team are as follow:

Bengali Community

1. Economic pull factor working for coming Bengali people from surrounding area of Modhupur forest.
2. There are presences of *forest thieves* who are felling trees for timbers.
3. There is growing groups of pirates snatching valuables from tourists.
4. The forest is eroding day by day.
5. There is no major conflict between Garo and Bengali people.

Overall Observation

1. Government agriculture department is working to develop man made rubber plantation in order for economic development.
2. Loss of Biological Diversity has been ignored even by the very organization who is supposed to protect and preserve the natural forest.
3. There are depleting image of the forest.
4. There is less presence of wild animals in the forest.
5. There is a Bangladesh Air Force firing Range at Rasulpur inside the forest which is creating threats to wild animals as there are heavy sounds of firing in firing sessions which frightens wild animal and disturbs their reproductive activities.
6. The existence of the forest as there is sight of depletion in every part of the forest.

5.7.2 Case Study-on: Chokoria Mangrove Forest (Map 6.3)

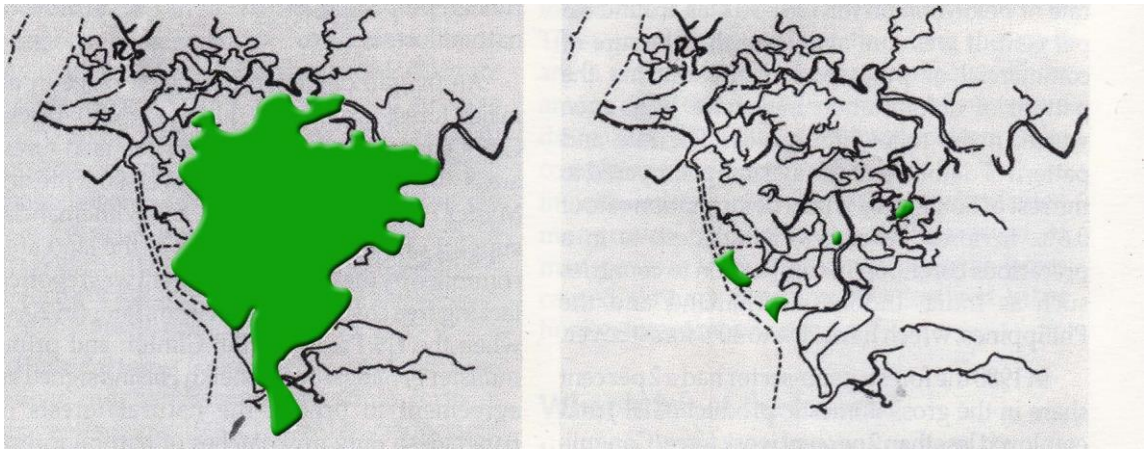
Chokoria Sundarban in a mangrove patch is situated in the southern part of the country. Once it was a habitat of diverse plants and animals but it is completely replaced by brackish shrimp cultivation. The forest was home of tigers, deer's, wild cats, wild boars, foxes *etc*. These all animals are now rarely seen in the region. The forest was unique with 20 species of trees, some as high as 15 meters. Sundari, Geoa, Keora, Bain were some of the major species. Today the lush green vegetation is gone and also gone is the unique,

diverse life its environment sustained. In the coastal belt the mangrove forest serves as a shield against cyclones and that tidal surge and gives much-needed protection to the people who live close to the Bay of Bengal. The Chokoria Sundarban provided protection to the people who live in the locality. Today no trees in the Chokoria Sundarbans and no such safety bulb for a few thousand people who live close to the forest that was. Today there is no such forest is seen in that area. The Chokoria Sundarban enriched the local environment with the diverse animal and plant life nurtured. Damages of Chokoria Mangrove Forest within a short period.

This disappearance of Chakoria Sundarban first started in 1929, when British Governments leased out 3910 acres of forests land to 262 local landless families by forming an association of settlers for cooperative cultivation for their subsistence income. That was the beginning of forest clearing activities by human beings (Bangladesh Environment Facing the 21st Century Edited by Philip Gain). Gias Uddin Chawdhuri, a promonent local of Chokoria Sundarban is leased 563 acres land of Chakoria Sundarban in 1977 with a view to establishing Shrimp farm, duck farm and agro fisheries (Bangladesher Biponno Bon by Philip Gain). The major assault on the area came in 1980 when so called development organization has come to develop shrimp firm clearing the forest. The statistics from the Department of Environment reveals that Asian Development Bank took major portion of the forest (around 7000 hectors) land for shrimp cultivation and then it is occupied by the ministry of Land only to perpetuate the development of shrimp firming in the area. The Asian Development Bank begans to fund shrimp cultivation in 1982. Its loan helped set up over a hundred shirmo firms (each eleven acres in size) and build a 16 kilometers embankment. Then came US$ 26.5 million dollar shrimp culture project funded by the World Bank. The project included a grant from the United Nations Development Program (UNDP). The World Bank's loan [Under Structural Adjustment Program] was used to develop 468 plots (each ten acres in size) and infrastructure (Bangladesh Environment Facing the 21st Century Edited by Gain, 1998).

By this impractical and unscientific investment of the many authorized organization the disappearance of a most potential forest of Bangladesh is started.

Total disappearance of the 21,000 acres Chokoria Mangroves in Cox's Bazar, largely due to Shrimp cultivation, is an example of how shrimp cultivation has caused unprecedented harm to the unique mangrove ecosystem. The unique mangrove patch in the southeast of Bangladesh has lost all but its name today. Thousands prawn farms have replaced almost the entire forest.



1976
Chokoria Sundarban-19,617 acres

1995
Chokoria Sundarban-466 acres

Source : Gain 1998

Map 5.3
Chokoria Sundarban Forest (1976 – 1995)

The Chokoria Sundarbans today- the evergreen forests have been replaced by thousands of shrimp ponds. An ecocide indeed!

Impact on the environment due to the disappearance of natural forest is alarming. Change like Soil turned into salty, human health at risk, animal husbandry appeared tough in want of grazing land, Sea water in absence of forestry often flooded the adjacent area, has abolished the natural ecosystem. Furthermore, natural protection from disaster like SIDR by the forest has been demolished due to the disappearance of the chokoria forest. An attempt has taken to reverse the process by the World Bank but did not stop the degradation. Thus the emergence of development effort has jeopardized the normal dynamics of environment.

5.8 Effective Implenmentation of Law

Laws on this ground are implemented from different grounds. The common two sectors of them are discussed below with the case study-

5.8.1 Case Study on : Hilsa Fish (*Hilsa ilisa*) (Table 6.1)

There are many rivers throughout the Bangladesh. Some of them are very potential source of Hilsa Fish. Hilsa is a national fish of Bangladesh and it is very popular over the world. Hilsa gives us both protein and foreign currency. Twelve percent of total fish production of Bangladesh comes from Hilsa. Bangladesh contributes 50-60 percent of world's Hilsa production. Almost 20-25 lac peoples are engaged with the Hilsa production directly or indirectly (Jatio Motso Saptah Sonkolon-2010). It is also known as Hilsa Shad fish. Hilsa or Hilsa Shad fish is now a most cherished treasure of Bangladesh. Bangladeshis and Bengalis are noted for their love of fish, and Allah could not have rewarded them better than providing her waters with this most exquisitely delicious fish to titillate the palates of Bangladeshis.

May to October is generally considered the hilsa catching season in Bangladesh. But unfortunately the production of Hilsa fish is decreasing day by day for violating the laws imposed with a view to ensuring high production. As a result, dispute and frustration are arising among fishermen and traders in the coastal region. Fishermen's families were passing hard days as the catches were not sufficient even to recover the cost of deep sea trips on trawlers for the purpose.

Over 500 trawlers from coastal districts of Patuakhali and Barguna got engaged in catching hilsa in the deep sea after the end of ban period of hilsa catching but they caught hilsa much less than expectation. The prime reason of arising this crisis is not to have proper implementation of the relevant law. Many fishermen were using current net and catching Jhatca illegally but law enforcement authority did not play their responsibility properly.

According to my visiting experience of Meghnaghat (Chadpur), I went to Meghnaghat (Chadpur) in Mach 2007. Though it was not a seasonal period of Hilsa fish nevertheless a largest amount of hilsa is caught by the fishermen. According to the view of the local fishermen, the amount of harvested hilsa this year was more than the last few years. They told me the Caretaker government (Oct'06-Dec'08) played vital role to increase the hilsa production in their ruling period. Fishermen and others illegal hilsa hunters could not catch Jhatca by using current net for having effective role of the coastguard and other law enforcement authority.

Table 5.1
Yearly Hilsa (*Hilsa ilisa*) Production in Bangladesh

The production rates of last few years of Hilsa Fish are given in the table below

Year	Hilsa Production (Metric ton)		
	Local	**Sea**	**Total**
1987-1988	78551	104950	183501
1988-1989	81641	110311	191952
1989-1990	112408	113943	226351
1990-1991	66809	115358	182167
1991-1992	68356	120106	188462
1992-1993	74715	123115	197830
1993-1994	71370	121161	192531
1994-1995	84420	129155	213535
1995-1996	80625	126660	207285
1996-1997	83230	131204	214434
1997-1998	81634	124105	205739
1998-1999	73809	140710	214519
1999-2000	79165	140367	219532
2000-2001	75060	154654	229714
2001-2002	68250	152343	220593
2002-2003	62944	136088	199032
2003-2004	71001	184837	255839
2004-2005	77499	198363	275862
2005-2006	78273	198850	277123
2006-2007	82445	196744	279189
2007-2008	89900	200100	290000
2008-2009	95970	202951	298921

Jatio Motso Saptah Sonkolon, 2010

However, it is happy news for us that, If the law enforcement authority and other empowered authority are been able to implement the laws related hilsa as it should be done then the production of hilsa will be increased. From the table given above, it is clear to us that after coming the caretaker government to the power and implementing the laws properly the production of Hilsa are continuously increased.

5.8.2 Case Study on Brick Fields (Table 6.2)

Brick fields are categorized as the most pollutant industry in the country. Its impact on the environment is high from two sides. In one side it destroys the forest/ trees in the areas. In other side, it produces Carbon di oxides which diffuse in the lower strata of the atmosphere.

Laws have been enacted to arrest this two sided impact. Coal is suggested as a fuel to burn the raw bricks in order to reduce deforestation. Chimney must be made at a height no less than 100 meter which will protect the lower level air from the smoke that the industry produces.

In 1997, Department of Environment conducted study on how many brick filed owners have complied with the newly formulated laws. Survey covered 193 brick fields near the Dhaka Metropolitan area and found that 99 used only coal, 87 used only log, 5 burnt tires and 2 used both coal and log. This use of coal in the factory accounts for the around 50% of the total fuel producing means to manufacture bricks. In case of chimney heights, not a single brick fields found which abide by the minimum heights set by the law.

In 2007, similar survey from the field visit in Dhaka City, Sirajgonj, and Bogra demonstrates that this law abiding tendency has increased after visiting 220 bricks fields. Among the fields visited, the reduction of wood used in the field's accounts for the 25% and Coal use rises to 72%. Regarding the chimney Heights, the survey indicates that almost all the fields followed the minimum heights according to the law.

Table 5.2
Present Status of Brick Field in Different District of Bangladesh

Various thanas in Bangladesh	No of brick field	Use of Coal/ Trees or logs	Height of chimney	Use of Percentage of coal/Trees or logs	Total amount of brick field
Sirajgonj	30	Coal	120	Coal 72% Coal + Trees/Logs 27%	100
	20	Coal + Trees or logs			
Bogra	50	Coal	120		150
	20	Coal + Trees/Logs			
Dhaka Metropolitan	80	Coal	120		300
	20	Coal + Trees or logs			
In total	220				

However it has not been evident that using coal in brick fields will make the owners operation easier since the excess demand for coal must be met by importation of coal. Being ensuring the supply and cost effectiveness, this sustainable procedure may become even more popular and acceptable by the people.

Conclusion

Laws are nothing but an instrument to do or not to do something. Without having proper implementation of these laws no environmental development can be achieved. From the mentioned case studies it is proved that if the laws are implemented effectively then the environmental situation must be developed. In the studies of Hilsa Fish and Brick Fields it is seen that the period in which laws were implemented properly shows good production of Hilsa Fish and tremendous change in Brick Fields sectors infavour of our environment.

5.9 Wildlife Consumption and Trade

Different type of people in Bangladesh used to consume some amount of wildlife species or their products because food, fuel, tibe, fertilizer comes from biodiversity or wildlife species.

Domestic use of wildlife as food, pets and sources of raw materials for making indigenous medicine and their skins/hides for making handcrafts is negligible. The turtles, game birds, deers and boars provide meat; lizards and snakes provide skins; Parakeets and Hill Mayna are raised as pets.

Export for the frogs, turtles and monitor lizards, no other wildlife species from Bangladesh had been traded in large quantity to the international market. After independence in 1971, there has been a rapid change in consumption pattern. The demand in the international market and enormous unemployment have let opening of new non-traditional commodity based trade and business. The frog legs, live turtles and other biological resources are legally for exported from Bangladesh. The government does not have appropriate policies and guidelines to manage the business of these biological resources in a sustainable manner. Most of the biological resources are exploited from the wilderness in an unsustainable manner. As a result, the population of some wildlife species has become commercially threatened. To control this situation the government has imposed a ban on trade in wildlife without addressing the issue for a long term sustainable management. The frog legs and turtle meats have been allegedly traded under the camouflage of frozen fish/foods even after frequent ban on commercial trade in wildlife.

5.9.1 Frogs

Frogs have a high demand in the international market. This led the Bangladeshi traders to export frog legs in large quantity until the early eighties. Most of the frogs used to be harvested from the wild and exported as a frozen food item. Indiscriminately harvest of frogs-main predators in crop fields resulted in enormous use of insecticides in the agriculture fields to control the massive attack of the pests. Uncontrolled harvest of frogs from the wild adversely impacted not only the food-chain, but also had an enormous impact on the population of predators such as monitor lizards, snakes and birds of prey. The environmental activities from home and abroad strongly demanded a ban on frogs collected from the nature. Under pressure of the wildlife scientists and environmental pressure groups, the Bangladesh Government proclaimed some laws to control the trade in frog legs and imposed a ban on the export of frogs. Importing countries of the frog legs from Bangladesh are USA, United Kingdom, Hong Kong, Netherlands, Canada, Belgium, Korea, Bulgaria *etc*.

5.9.2 Turtles and Tortoises (*Geoclenys hamitonil, Melanochelys trijuga*)

Turtles, tortoises and terrapins are locally known as Kachim/Kachamp/Kaitta *(Batagur baska)* Bangladesh supports 25 species of Chelonia of which 18 species are freshwater turtles, five are marine turtles *Cuora amboinensis, Geocle,nys hamitonil , Hardella thurjii, Kachuga Dhongoka, Kachuga kachuga* and two are land tortoises *Melanochelys trijuga, Melanochelys tricarinata*. Besides their natural ecological role, the Chelonia population in Bangladesh provides meat protein to a percentage of people, especially the ethnic communities. Turtle has been one of the major non-traditional export earners or the country for a long time. Other than use as table food, different byproducts extracted from turtle fats, carapace, plastron and eggs are widely used for treatment, making handicrafts *etc*. Bostami turtle named after a shrine, Bayezid Bostami in Chittagong is the only endemic wildlife of Bangladesh out of over 1000 species of wildlife so far recorded. This giant turtle *(Aspideretes nigricans)* is found only in a lone pond of the shrine in Chittagong and nowhere else in the world.

Turtles are considered as religious symbols. According to Hindu mythology, the universe is supported by four elephants standing on a turtle's back. People show special reverence to the turtle as they consider the turtle as one of the ten incarnations of `Vishnu' the supreme God. River jamuna, mythological used turtle as her vahan (carriage).

Majority of the freshwater turtles are herbivorous and they control growth of aquatic weeds and other submerged vegetation and maintain healthy aquatic environment for other wildlife and fish. The soft-shell turtles are omnivorous and they are scavengers to the dead bodies of other animals.

A huge quantity of turtles is exported from Bangladesh. Turtles are exported mainly to Singapore, Hong-Kong and China from Bangladesh. All the specimens exported are collected from nature. There is no farm for procreating turtles in captivity. Harvesting of turtles from the wild has drastically reduced their population and established their habitats. To save the turtles from going extinct in Bangladesh, the present unsustainable harvest must be stopped and must implementation of biodiversity laws.

5.9.3 Snails (*Pila globosa*)

People belonging to different tribes in Rajshahi, Naogaon, Dinajpur, Chittagong, Rangamati viz, Chakma, Pahan, Orao, Buna, Coch, Garo, Hazong, Khasia, Tripura, Marma, Murang, Pahari, Saontal, Rakhain, Buna are used to consume the different type of snails such as *Pila globosa*, *Bellamya, bengalensis, Lamellidens marginalis etc*. regularly to meet up their animal protein requirments. They are used to prepare their curries, with the flesh and viscera of snails in various forms such as ghati, soup, wetfried, fried (Islam *et al.,* 2009).

At the same time flesh of snails is being expensively utilized in freshwater prawn *(Macrodrachium rossenbergii*) and the brekish water prawn (*Peaneus monodon)* culture in south western part and of their region of the country. In addition to that domestic duck poultry, and diffirents cat fishes are also feed with flesh of the snails species. As a result Madaripur, Gopalgonj, Sariatpur, Faridpur, Rajbari, Magura, Norail, Jhenaidoha, Kustia, Chuadanga, Meherpur, Jessore and Bagerhat the significant wetland on south west Bangladesh are under threat of over exploitation area of many kind of snail.

The natural snail populations in the wetland areas of the country are the exclusive source to meet up such high demands. As a result over exploitation without any scientific management of the snail population is causing the bioderversity depletion.

5.9.4 Gharial (Gavialis ganjeticus) and Crocodile (*Crocodylus prosus*)

Once this animals were found in the padma, jamuna tista, Mohnanda including Rajshahi area. But now a days it has been very rare. Experts opine that there are only 20-22 pairs of Gharial still exist in our country. But most disappointing news is, even after searching for years all throughout the country, their existence has not been located. Moreover, Crocodile in southern region is not seen as much as it was before.

Why the number is decreasing day by day is sorted out below:

- Smuggle to abroad since its flesh and leather is widely demanded and hence earn a lot of money
- Loss of Habitat
- Water Pollution
- Cleavage of Natural Food Chain
- Obstacles to normal Reproduction

5.9.5 Royal Bengal Tiger *(Panthera tigris)*

Royal Bengal Tiger is the national animal of Bangladesh. It selects her accommodation considering with mainly food, shelter, risk less, mutual activities facilities *etc*. Mainly it lives in hilly forest, ever green forest, free forest and mangrove forest through the country. But now, it is not found without sundarbon at anywhere in Bangladesh. It's alive in sundarban with very crisis. Its found also except Bangladesh, in India, Bhutan, Nepal, Myanmar, Indonesia, Malaysia, China and Russia. According to the red list of IUCN, there are 2500 tiger in the world. In Bangladesh, there are 200 but in 2004, in a survey completed by Bangladesh government, the number of tigers is 440 by the conversation with the bearable villager of the sundarbon, the information is given by them, the number tiger is about 200-250. The number of the tiger will be reduce continuously, if we do not take mutual and effective step, to continue and increase also this number of tiger in sundarbon. The causes of reduction of tigers as under follows;

1. Weather Changing
2. to Increase Natural Disaster
3. Minimize Sweet and Maximize Salty Water
4. Setup new Accommodation
5. Increasing Blakers

5.9.6 Mongoose (*Herpestes edwards*)

These mammals live throughout Bangladesh. It likes to reside beside the paddy fields. It hides in the hole of the bank of the river. There are three kinds of Mongoose But those found more often are smaller in size. These animals preserve the balance of environment and protect crops. Nevertheless, these animals are decreasing gradually. On the other side, it fall prey to the people of the neighboring locality while it tries to catch its prey such as hen, duck, *etc*.

Killing this animal is increasing at a massive scale. If this continues, this will lead to extinction by short time. Massive killing is committed in the tribal areas in Chittagong, Rajshahi, and Moymensingh.

Eventually it is found after study that the key animals of Bangladesh like Gharial and Crocodile, Kuchia, Snails, Monitor Lizards, Turtles, Tortoises, Frogs, Snails, Monitor Lizards, Turtles, Tortoises, Royal Bengal Tiger, Mongoose *etc*. which play vital role in our environment are decreasing day by day for lack of appropriate residence, security and necessary food of them. Though there are few laws to protect this massive decreasing of animals but not properly enacted and effective.

5.9.7 Conclusion

In this chapter, we have tried to discuses briefly the Impact of Environmental Law for the Conservation of Bio-diversity. The main reason of reducing biodiversity is not to have enforcement of environmental law. If the environmental laws are been enforced properly then conservation of biodiversity is possible to preserve fruitfully

So we should be respectful upon the environmental laws to ensure enforcement of them. Otherwise, in near future, biodiversity of Bangladesh may be null and it may produce natural disaster Therefore people of the world should be attentive to protect the world from Environmental misbalance, and there is no alternative to execute the rule and regulation. To remain Bangladesh competent to live, we also be serious to protect flora and fauna through execution of Environmental Laws.

Chapter 6
General Conclusion on Biodiversity Law

There are quite a few examples where environmental issues have successfully been addressed. Bangladesh has been able to create an enabling policy regime for better management of environment and natural resources. The policies has adopted in principle the concept of sustainable development and recognized the importance of economic development that goes in hand with the control of environmental pollution and maintaining ecological balance. An enabling legal environment has been tried to create by establishing Environment Court, enacting Environmental conservation Act and Rule, making EIA mandatory for all development activities etc. However, the usual practices (in terms of environmental pollution and natural resource management) still lag behind the policy. The challenges in the year to come are on how to achieve the accountability and governance in managing the natural resources and environment. Some of the constraints, in terms of institutional, legal, policy framework, for effective environmental governance are discussed below.

Lack of Inter-Sectoral Coordination

Inter-sectoral coordination in dealing with cross-cutting issue like environment is a major issue in Bangladesh. The management responsibilities of different environmental components are divided into different sectors and ministries. This hinders smooth operation and execution of sustainable management regime. For example, the Department of Fisheries is responsible for the improvement of the fisheries sector, but legally the owner of the water bodies other government bodies. Access rights to *jalmohals* larger than 3 acres are controlled by the Ministry of Land and Ministry of Youth and Sport. The Ministry of Water Resources is responsible for *haor* development. Only recently a small number of selected *jalmohals* have been handed over to DOF to develop community based fisheries management. Often activities of the Water, Communication or Local Government Ministry cause damage to the fisheries sector as well as to the natural ecosystems. These give rise to inter-sectoral conflicts, mainly due to lack of coordination. In the process, the subject of protecting the resources and the ecosystems does not happen to be treated with appropriate urgency and priority and thus creates inconsistencies.

Conflict in Sectoral Policies

Sectoral policies are sometimes found to be in conflict with each other. Some provision of the Fisheries Policy contradicts that of the Land or Industrial Policy; Environmental Policy does not conform to the narrow objectives of the Export Policies etc. For example, the Environment Policy stresses the necessity of "encouraging land use systems compatible with various ecosystems" (www.monash.edu.au/research).It emphasizes the adoption of measures to "prevent spread of salinity and alkalinity on the land". On the contrary, the Export Policy 1993-1995 emphasizes the rapid expansion of traditional/semi-intensive cultivation of shrimp to increase export. Similarly the Forest Policy 1994 prohibits conversion of forest land for other uses. But the conversion of tree cover for setting industries, institutions such as universities, army cantonments, firing ranges etc. are very common. This sort of conflicts among the policies is serious flows in this aspect.

Lack of Institutional Capacities

Institutional capacity for implementing the various action measures identified for fulfilling the primary functions of environmental planning, monitoring and enforcement remains weak. MoEF has yet to develop a strong functioning Planning Cell to support its work. It lacks essential baseline data on resources and areas of environmental concern. Although it now acts as a "clearing house" for all development projects put forward by the different line ministries, it lacks the necessary basic technical expertise to effectively assess and monitor projects for their environmental impact and it suffers from a shortage of basic facilities, equipment and logistic support (MoEF, 1995).

The Department of Environment and Forest Department faces similar weaknesses. They have shortage of adequate and trained manpower. There is lack of an information management system supported by a strong data bank to back up planning, policies and monitoring activities. Absence of regular training programs to support staff development

In NEMAP document, it has been emphasized to set priority to identify a systematic program to strengthen the Ministry's institutional capabilities, based on its present and projected requirements. Towards this, under the BEMP, a strategic plan has been developed to strengthen DOE's capacity. Institutional capacity of other cross-cutting Ministries and their technical departments in dealing environmental issues also remain as a key concern.

Regulatory and Institutional Inadequacies for Policy Implementation

All the important policies including the National Environmental Policy of 1992 have been formulated in the last decade and only a very few of them seem to corroborate well with the older legal instruments of the given sector. Although the need of amendment of existing laws and formulation of new laws were the main cause of having many of the policies revised or declared a fresh, only a very few laws like ECA of 1995, ECR of 1997, Forest Act 2000, etc. could be tabled.

The formulated policies, although fairly rich in content, are not always supported by necessary actions of implementation. The policies are not that convenient to implement either. This is due to a number of factors including lack of consistency among the policies and the institutional weakness of the line agencies of the Government. Most of the concerned Ministries and Departments including the MoEF lack institutional capacities in terms of human, technological and financial resources needed for proper implementation of the policies.

The management of a given resource become very difficult, complex and cumbersome when it falls under the jurisdictions of two or more authorities, be they departments or ministries. The serious lack of coordination, the sense of domain and above all the underneath interest of the personnel of the authority are the basic causes that lead to such situation and is really difficult to resolve. The natural resource sectors such as water, fish, forests, etc. are the worst sufferers in this context. Polices are thus often criticized for their lack of directions for co-operation, coherence and coordination among the interested parties involved there in. For example, under the national Fisheries Policy, the MoFL is expected to "control all aspects of fisheries sector". (www.monash.edu.au/research) However, no reference was made to the required linkage with the numerous agencies and ministries those mange different aspects of fisheries. Though the policy states that "coordination' will be established but the mechanism for that has not been spelled out. Under the Environmental Policy, the Ministry of Environment and Forest is assigned with the responsibility to implement the policies concerning protection of forest, wildlife, ecologically critical areas, biodiversity, etc. their responsibilities are not well defined. Besides these due to the absence of an overall monitoring authority of MoEF, no progress or suggestions for the improvement in this area has yet been achieved.

Outdated Law

The majority of the environmental laws were passed under substantially different population and development conditions. These outdated laws and other improperly and incompletely updated laws are neither adequate to meet the present day needs of the country nor consistent with the changing environmental scenario of the world. A law passed two to five decades back cannot incorporate the concept of sustainable development or one's right to healthy environment, which are the outcome of very recent concern about environment. Such laws can not play any effective role in combating environmental pollution in today's Bangladesh, where overpopulation, poverty and illiteracy are aggravating this crisis everyday. For example, *Agricultural and Sanitary Improvement Act, 1920; Water Hyacinth Act, 1936; Embankment and Drainage Act, 1952; The Town Improvement Act, 1953; Shops and Establishments Act, 1965 and Bangladesh Pure Food Ordinance, 1953*- important environmental laws - have not been updated yet. These laws, having been passed two to five decades back, can not possibly have incorporated the modern concepts of sustainable development or environmental protection.

Non-Punitive Approach of Laws

The existing laws can be criticized for their non-punitive approach. Only a few legislations like *The Penal Code, Tea Plantation Ordinance, Wildlife (preservation) Order* etc. provide for punishment, but these are also too marginal to influence people's attitude. For example, the maximum punishment under the Penal Code for fouling water is only three months' imprisonment and that for making atmosphere noxious is only five hundred taka in fines. Under the Agricultural Pest Ordinance, 1962, punishment for transport or sale of infested crop is a maximum 500 taka fine www.supremcourt.govt.bd and that under. The Agricultural Pesticides Ordinance, 1971, is a maximum 1000 taka.

6.1 Conclusion

Bangladesh is an important country in the world regarding the vulnerability aspect of environmental disaster. Laws and regulations regarding the environmental issue reflect utter responsiveness and government's attention in order to protect the people and development. In fact, Bangladesh has adopted considerable amount of laws and practices. Nevertheless, she has not been able to show the beneficial legacy of the formulated laws. The above mentioned bottlenecks have been identified as the cause of not ripening the

due benefit ensuing from the laws. Though the previous chapter has identified that the laws that introduced in our country is enough, this chapter has pinpointed the limiting factors of those laws; lack of institutional capacity, blurring boundaries of responsibility among the ministries, conflict of institutional interests, destruction of natural aesthetic and biodiversity in the name of development, soft and often delayed punishment contributes to gradual depletion of biodiversity.

The conditions we notice in Modhupur today are but a sad reflection of what has been happening to forests all across the country. It is generally the idea that 25 per cent of a country's land mass will be covered by forests; and indeed there used to be a time when greenery formed a major part of the Bangladesh landscape. That unfortunately is not the reality any more. Today, forests cover less than 10 per cent of the land, a clear sign of how human predatory instincts have systematically undermined the ecological balance in the country. As the Modhupur instance demonstrates, natural trees have been cut down and replaced with plant species such as acacia, eucalyptus, rubber and the like. Amazingly, such replacement of natural trees has been the result of donor-funded projects, which again means that apart from the criminal elements engaging in the destruction of the forests, there have been forest department officials themselves who have contributed, wittingly or otherwise, to their shrinking. Where the role of the authorities should have been a promotion of conservation and keeping tabs on those ready to profit from a destruction of trees, they appear to have speeded up the process of the destruction. Indeed, ideas such as building eco parks in Modhupur at the cost of the woodlands and to the detriment of the indigenous people who have lived there for ages have also placed the forests at risk.

In such conditions, there arises a huge need for corrective measures to be taken. For years various governments in the country have been crying hoarse about the need for trees to be planted throughout the country. Not much attention seems to have been given, though, to the natural forests which have been shrinking rapidly. Such a policy of looking away from reality must be reversed, drastically, if a proper ecological balance is to be restored.

From the different ground of my study environment is found as a key contributor in human life by which we may be benefited from the both side ecologically and economically. Many jurists, environmentalists and biologists nationally and internationally commented from their different experience that we can not imagine our healthy life without a healthy environment. Unfortunately it is true that we are not

maintaining ourselves under the environmental laws besides having an enormous necessity of it.

The first environmental law of Bangladesh is introduced in Britain titled "The Public Health Act, 1875". As per the demand of time the environmental laws and policies are gradually developed with the consideration of the environmental harms. Since the British period, there are almost 200 laws in Bangladesh which are directly and indirectly related to our biodiversity.

The stepladders taken governmentally and non-governmentally were enough to ensure a healthy and safety environment but the mismanagement of the administrations, abuse of the laws, inter sectarian confessions, lack of institutional capabilities are destructing our environmental situation day by day.

As a citizen of over populated country, Bangladeshis are well trended to the violation of laws. They collected the natural resources unlawfully for meeting up their demands. Sometimes they are bound to do these brutal acts for their survival needs. As for the burning example the situation of Sundarban may be mentioned. Thousands of people live in this beauty jungle and they absolutely depended upon resources of this largest mangrove forest. They are collecting natural resources indiscriminately and no measure is being succeeded to stop them.

Two exemplary case studies about fisheries and brick fields discussed elaborately in my study imply that our whimsical misconduct to the laws are the prime causes of having hindrance before the development of our environmental biodiversity. Effective implementation of laws can keep positive impact on our environment which is proved by those case studies.

The given recommendations in our study may keep us on the way of solutions. First of all we have to modify the laws and policies related to the environment for meeting up our present socio economy aspects of Bangladesh as there are the new problems created gradually for facing the challenges. New law is needed on the perspective of modernity which also impacts our environment seriously.

The study reveals that the biodiversity degradation and environmental damaging are not a local issue and not confined in our boundary today. It is now a burning question of the time throughout the world and many countries of the world are concerned to this issue. Environmental drawbacks may through the world community in a big natural disaster.

The developing countries are in danger to be victim mostly but unluckily they are not prepared completely to face these shorts of natural calamities.

Finally it is mentioned that the government should be consensus first and take the necessary measures with a view to making his people cognizant. Saving biodiversity and promoting up its development is not possible for the government alone. Besides the government efforts every people has to play vital role to make our environment healthy by keeping contribution from their individual grounds. Effective enforcement of laws should be ensured to all the grounds related to Environment.

6.2 Recommendations

The Following Suggestions can be Made which can Provide Sustainable Biodiversity

1. Biodiversity Rules and Regulations must be Updated and Enforced Strictly. Must be Planned to Formulate Appropriate Biodiversity Law and its Competent Implementation.
2. The Ministry of Environment and Forestry should have a separate Wildlife Cell or Department.
3. Illegal Capture of Wild Fauna and Aquatic Endangered or Threatened Species must be Stopped and Over Harvesting Stopped.
4. At least some Major Forest Area, Wetlands and portion of River should be marked as Sanctuary for Bio-diversity Conservation under the Direct Supervision of Government.
5. Water Pollution by any means should be Minimized and Existing Rules and Regulations on Water Pollution should be Effectively Enforced. Effluent Treatment Plant has to set up to the Outlet of the every Industry.
6. Use of Pesticide in the Agricultural Fields should be Reduced and Biological Control of Pest should be Introduced.
7. The Height of Chimney of the Brickfield must by Beyond 120ft with a Scrubber in its Outlet. Brickfield must be Established Maintaining a Reasonable Distance and Position.
8. Cutting Hill in the name of Development and Burning the Trees to Cultivate ***joom*** is to be prohibited.
9. Mass Media like Radio, Television, Leaflets and Announcement *etc*. must be used in Wider Extent for Awareness Building among the Common people about the Consequence of Bio-diversity and its Conservation.

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1923 The Workmans Compensations Act (Act No. VII of 1923)
1925 The Highways Act (Bengal Act III of 1925)
1927 The Vehicles Act (Act No. 1 of 1927)
1927 The Forest Act (Act No. XVI of 1927)
1933 The Place of Public Amusement Act (Bengal Act X of 1933)
1933 The Suppression of Immortal Trafic Act (Bengal Act VI of 1933)
1943 The Bengal Vagrancy Act (Bengal Act VII of 1943)
1944 The Public Health (Emergency Provisions) Ordinance (Bengal Act VI of 1944)

Pakistan Era (1947-1971)

1947 The Coal Mines Labour Welfare Fund Act (Act No. XXXII of 1947)
1950 The Acquisition of Wasteland Act (Bengal Act XVII of 1950)
1950 The Import and Exports Control Act (Act No. XXXIX of 1950)
1950 The Maternity Benifit (Tea Estates) Act (East Bengal Act XX of 1950)
1952 The Undesirable Advertisement Control Act (Act XV of 1952)
1952 The Building Conostraction Act (East Bengal Act II of 1953)
1953 The Town Improvement Act (East Bengal Act No. XIII of 1953)
1953 The Public Safety Ordinance (Ordinance No. LXXVIII of 1953)
1953 The Dangerous Cargoes Act (Act No. V of 1953)
1957 The animals slaughter (Restriction) and Meat Control Act (East Pakistan Act VII of 1957)
1958 The Inland Water Transport Authority Ordinance (East Pakistan Ordinance No. LXXV of 1958)
1958 The Displaced Persons (Compansation and Rehabilation) Act (Act No. XXVII of 1958)
1958 The Displaced Persons (Land Settlement) Act (Act No. XLVII of 1958)
1959 The Cattle (Prevention of Trespass) Ordinance (Ordinance No. XII of 1959)
1959 The Cultivable Wasteland (utilization) Ordinance (East Pakistan Ordinance XIII of 1959)
1959 The Private Forests Ordinance (Ordinance No. XXXIV of 1959)
1959 The Forest Industries Development Corporation Ordinance (Ordinance No.

LXVII of 1959)
1962 The Society for the Privation of Cruelty to Animals Ordinance (Ordinance no. XV of 1962)
1965 The Factories Act (Act No. IV of 1965)

Bangladesh Era (1971-2004)

1972 The Bangladesh Malaria Eradication Board Order (President's Order No. 99 of 1972)
1972 The Bangladesh Water and Power Development Board Order (President's Order No. 59)
1972 The Bangladesh Inland Water Transport Corporation Order (President's Order No. 28 of 1972)
1972 Stastute of Indo-Bangladesh Jpint Rivers Commision
1973 The Bangladesh Wildlife (Preservation) Order (Presedent Order No. 23 of 1973)
1974 The territorial Water and Maritime Zone Act (Act No XXVI of 1974)
1976 The Chittagong Hill Tracts Development Board Ordinance (Ordinance No. LXXVII of 1976)
1977 The territorial Water and Maritime Zone Rules
1978 The prevention of Malaria (special provision) Ordinance (Ordinance No IV of 1978)
1982 The Attia Forest Protection Ordinance
1984 The Lifestock Research Institute Ordinance (Ordinance No. XXVII of 1984)
1989 Brick Burning (control) Act (Act No. 8 of 1989)
1992 Water Resources Planning Act (Act No 12 of 1992)
1995 The Bangladesh Environmental Conservation Act (Act No. 1 of 1995)
1995 Jamuna Multipurposes Bridge Project (Land Acquisition) Act

National Acts Statutes in Fisheries
Sectoral Development –Trends of Fisheries Laws

1864 The Canal Act
1876 The Irrigation Act
1881 The Obstruction in Fairways Act
1889 The Private Fishries Protection Act (Bengal Act No. II of 1889)
1890 The Railways Act
1908 The Ports Act
1920 The Agricultural and Sanitary Improvement Act
1923 The Boilers Act
1925 The Highways Act
1927 The Forest Act
1939 The Tank Improvement Act (Bengal Act No. XV of 1939)
1950 The Protection and Conservation Fish Act (Act No. XVIIIof 1950)
1950 The East Bengal Acquistion of Waste Land Act
1950 The East Bengal Acquisition of Wasts Land Act
1952 The Embankment and Drainnage Act
1959 The Goverment Fisheries (Protection) Ordinance (Ordinance No. XXIV of 1959)
1959 The Culturable Wasteland (Utilization) Ordinance

1963 The East Bengal Protection and Conservation Fish Rule 1985 (Amendment)
1965 The Factories Act
1972 Bangladesh Water and Power Development Boars Order
1972 The Indo-Bangladesh Joint River Commision
1972 The Bangladesh Island Water Transport Corporation Order
1973 The Bangladesh Fisheries Development Corporation Act (Act No. XXII of 1973)
1973 The Bangladesh Wild Life (Preservation) Order
1974 The Trrritorial Waters and Meritime Zones Act
1974 The Bangladesh Petrilium Act
1976 The Bangladesh Petrolium Corporation Ordinance
1976 The Chitagong and Mongla Port Authority Ordinance
1978 The Inland Shiping Ordinance
1983 The Fish and Fish Products (Inspection and Quality Control) Ordinance (Ordinance No. XX of 1983)
1983 Marine Fisheries Ordinance (Ordinance No. XXXV of 1983)
1983 Fisheries Research Institute Ordinance (Ordinance No. XLV of 1984)
1985 The Protection and Coservation of Fish 1985 (Amendment) Act
1985 The Ground Water Management Ordinance
1992 The Chinri Auvikor Act (Act No. 53 of 1993)
1992 The Chinri Auvikor Rules
1992 The Environment Policy
1992 The Environment Action Plan
1994 The Coastal Guard Act
1995 The Protection and Coservation of Fish Rules 1985 (Amendment)
1995 The Bangladesh Environment Conservation Act (Act No 1 of 1995)
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1995 The Fertilizer Regulation Order
1996 The Water Supply and Sewerage Authority Act
1996 The Bangladesh Agricultural Research Council Act
1997 The Bangladesh Environment Conservation Rules
1998 The National Environment Policy
2000 Rhe Environment Court Act (Act No. 11 of 2000)

National Acts/Statutes in Agriculture

1857 The Cattle Tress-pass Act
1864 The Canals Act (Bengal Act V of 1894)
1876 The Irrigation Act (The Bengal Act III of 1876)
1913 The White Phosphorus Matches Prohibition Act
1914 The Destructive Insects and Pest Act (Act No. II of 1914)
1919 The Poisons Act
1920 Thne Agricultural and Sanitary Improvement Act (Bengal Act VI of 1920)
1937 The Agricultural Produce (Grading and Marketing) Act
1949 The Non Agricultural Tenancy Act
1950 The Acquisition and Tenancy Act
1950 The Acquisition and Waste Land Act
1952 The Embankment and Drainage Act
1957 The Essential Commodities Act
1961 The Agricultural Development Corporation Ordinance

1962 The Agricultural Pest Ordinance
1964 The Agricultural Produce Markets Regulation Act
1971 The Agricultural Pesticides Ordinance
1976 The Bangladesh Agricultural Research Istitute Ordinance
1983 The Bangladesh Irrigation Water rate Ordinance
1984 The Bangladesh Institute of Nuclear Agriculture Ordinance
1996 The Bangladesh Agricultural Research Council Act (ACt VI of 1996)

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iv. International Plants Protection Conservation, 1951.

v. International Convention for the prevention of pollution of the sea by oil, 1954.

vi. Plan Protection Agrement for Asia and Pacific Region, 1956.

vii. Amendment of Plant Protection Agreement for the Asia and Pacific Region, 1967.

viii. International Convention Relating to Intervention on the high sea in cases of oil pollution casualities, 1969.

ix. Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), 1971.

x. Convention Concerning the Protection of World Cultural and Natural Heritage, 1972.

xi. Convention on International Trade in Endangered Species of World Fauna and Flora, 1973.

xii. International Plant Protection Convention (1979 Revised Text), 1979.

xiii. World Nations Convention on Law of the Sea, 1982.

xiv. Status of the International Center for Genetices Breeding and Biotechnology, 1983.

xv. Amendments to Articles 6 and 7 of the convention of Wetlands of International Importance Eassily as Waterfowl Habitat, 1987.

xvi. Convention on Biological Diversity, 1992.

xvii. International Plant Protection Convention (1997 Revised Text), 1997.

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1. International Convention for the Protection of Birds, 1950
2. Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter, 1972.
3. Protocol Relating to Intervention on the High Seas in Cases of Marine Pollution by Substance other than Oil, 1973.
4. Convention on the Conservation of Migratory Species of Wild Animals, 1979.
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