

Draft Report

Election 2001 : National Policy Forum

Dhaka: 20-22 August, 2001

Organized by:

Centre for Policy Dialogue, *Prothom Alo*, *The Daily Star*

**POLICY BRIEF ON “ENVIRONMENTAL
POLICY”
CPD TASK FORCE REPORT**

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BACKGROUND OF THE POLICY BRIEF EXERCISE ON ENVIRONMENT

The state of environment in Bangladesh is generally perceived as unsatisfactory. Concerns about our environment have grown in the past few years. There were many success stories in terms of building up the awareness among the public as well as among the conscientious citizens. Citizen groups and NGOs worked together on many issues to bring about a change in the environment. All these have brought 'environment' in the front row in our political agenda. Given this background, initiatives were taken by CPD to prepare *Pre-Election Briefs* on a number of issues to stimulate actions by the political parties in their manifestos for the coming General Election.

This brief has been prepared through a number of brainstorming sessions of the members of the task force and a public discussion on this issue held in Khulna. The Brief is expected to provide do-able policy guidelines for Bangladesh in the next five years. Many issues were discussed, however, not all of them appeared in this brief. The main reason is to keep the document as an action oriented policy document for the next elected government of Bangladesh. At the same time, it was also understood that several actions would eventually warrant other actions and policies and so it will be able to tackle some of the missing issues while being implemented.

In the above context, the important environmental issues are discussed below. In our presentation we have followed a simple principle of presentation – discuss the current scenario, identify the problem and prescribe do-able policies and actions for immediate (in 2 years) and medium (in 5 years) term actions.

OBJECTIVES

The objectives of the policy brief on environment are as follows:

- Assess the major challenges in the area of environment
- Assess the existing policies in terms of their implementation and weaknesses
- Provide policy guidelines for managing a sustainable environment for Bangladesh
- Suggest action plans for immediate and medium terms.

The brief was prepared in consultation with the members of the task force. The draft report was presented by the Co-Chair, in the CPD-Prothom Alo sponsored *Dialogue* held in Khulna in July 07, 2001.

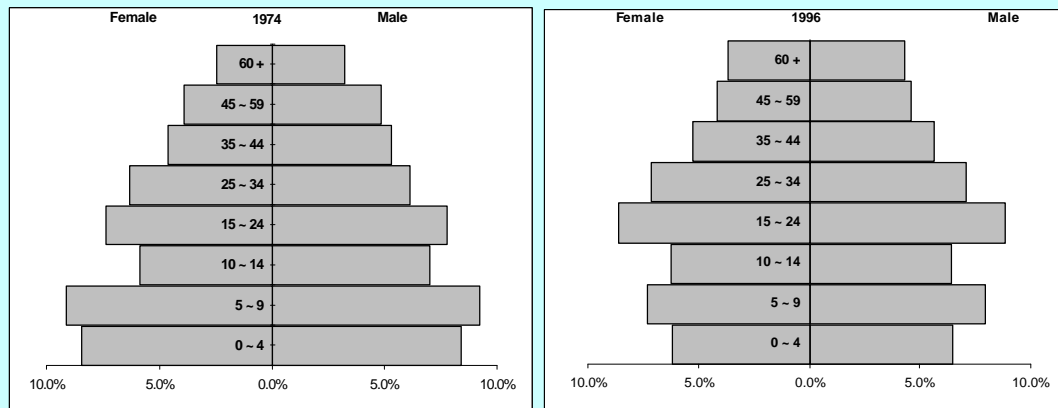
STATE OF THE ENVIRONMENT – ASSESSMENT OF CURRENT SCENARIO

While we wait for the result of the Population Census of 2001, it has been estimated that the current population of Bangladesh will be around 130 million. The current estimated population growth rate is around 1.6% and at this rate the population will be nearly 160 million in the next 10 years. The urban growth rate is 9% and so Bangladesh will be gradually moving towards urban life style by the middle of this century. The success of population control program is now noticeable in the population pyramids. The population pyramid between 1974 and 1996 clearly shows that the wide base at the bottom of the pyramid is shrinking, a bulge has appeared in the middle and the width is increasing at the top of the population pyramid. While, this is a great news for some, for the environment, it is a signal for a change. A change required to sustaining the level of development for our future generations. Low population growth rate is often associated with higher life expectancy, higher level of urbanisation, and higher level of industrialisation.

Against this backdrop, major environmental issues of Bangladesh include:

- Population pressure on the ecology of Bangladesh

Figure 1 Changing pattern of population distribution 1974 and 1996



Source: BBS Data

- Process of rapid urbanisation and its impact on Bangladesh
- Increase in the rate of pollution and their impacts
- Disasters and consequence of disasters on the environment

In terms of the policies on environment, the committee during its deliberations considered the following set of policies that already exist in Bangladesh.

- Environment Act 1995; NCS report, NEMAP report
- Existing legal framework and the Environment Court
- National Water policy, Forest policy, Land policy, Agriculture policy and Fisheries policy
- A network of Protected Areas, a list of Ecologically Critical Areas (ECAs)
- Environment Regulation of 1997 and requirement for conducting Environmental Impact Assessment for projects

The committee also divided their discussions in terms of the following management issues that are integral part of our sustainable management of the environment.

- Wetland management including over-draining
- Coastal and Marine zone management including water logging.
- Watershed management and regional co-operations
- Fisheries and Forestry Management including issues related to shrimp culture
- Managing exotic species (in particular management of Alien Invasive Species)
- Managing Genetically Modified Organisms and Living Modified Organisms in Agriculture
- International Treaties, Conventions and Protocols and position of Bangladesh
- Management of urban and industrial pollution
- Management of wastes with focus on hospital and toxic wastes
- Water supply and sanitation
- Natural Disasters
- Rules, regulations and enforcement status.

POLLUTION AND DEGRADATION

Air pollution, water pollution, and land degradation are major environmental problems of Bangladesh. These problems are linked with traffic management, urbanisation, waste disposal mechanism, and management of surface and ground water.

Air Pollution

Dhaka has one of the highest air pollution in the region. Most of these pollutions are from vehicular sources and it is a prime example of management failure. Until 1997, no major air pollution measures were available in Dhaka. Recent data shows air pollution level in Dhaka varies from locations to locations. The busiest road intersections in Dhaka like, Farmgate, Kawranbazar, Mohakhali, Shantinagar and Jatrabari have the highest level of particulate matters in the air. In some cases, it is 2 to 3 times higher than the maximum allowable level in the dry season. Traces of other gases like CO, NOx and SOx are also high and sometime exceeds the safe limits on busy days with heavy traffic jam or near industrial areas. Lead pollution in the air was very high until the introduction of lead-free petrol in the city since 1999.

- Particulate matters can enter into our respiratory tracts and even into the air pockets of lungs causing throat infection, bronchitis, asthma and pneumonia. High level of air pollution is also linked with increased incidences of cancer and heart troubles in many parts of the world. Persistence of air pollution in a city for a longer period also lead to permanent disabilities among the infants.
- Noise pollution in Dhaka is also very high. One of the major reasons for higher noise pollution in Dhaka and in other urban areas of Bangladesh is indiscriminate use of hydraulic horns in vehicles. At the same time, bad traffic management causes drivers to use horns when it is usually not required. Such management failures include non-compliance of rules related to pedestrian crossings, non-enforcement of lane disciplines and unawareness of the drivers. It has been observed that a large portion of drivers of smaller vehicles (like three-wheelers) is becoming deaf due to high level of noise pollution. This will become a public safety concern in near future for travellers.
- The direct costs related to hospitalisation and medicine will tremendously increase in the coming years if higher level of air pollution is not reduced in Dhaka and also in other urban

locations. The cost of air pollution to the nation will exceed few billions if we take account other indirect costs like loss of life and loss of workdays.

- Two-stroke engines and old vehicles, which are very inefficient in burning fuel, are the major source of such high air pollution level in Dhaka. At the same time, plying of motorised and non-motorised vehicles (like rickshaws) on the same road together with bad traffic management often multiplies the level of pollution.

POLICY ACTIONS

Considering these factors, the Committee, suggest the following measures to reduce air pollution in Dhaka. These rules can be applied in other locations with similar level of pollution.

MASS TRANSPORT SYSTEM

Nearly 80,000 people live in a square kilometre of land in Dhaka. In addition people commute from nearby districts to work in Dhaka. Yet Dhaka has failed to develop a network of public transport system both for commuters and for people living within the city. This is a major cause for the rising level of air pollution in Dhaka city. The situation is also similar in other major cities of Bangladesh. There are bus services (both public and private) in these cities, however, their unit capacity is small, the fleet age is old and the conditions are poor. Some smaller cities, who had bus services, have lost their bus services. As a result, people are being depended on three-wheelers – causing more air pollution.

Large Cities (like Dhaka, Chittagong, Khulna) should, therefore, regulate its transit services both in terms of the age of vehicle fleet and the size of vehicles used for public transportation. Double-decker or double buses are our immediate options while electric buses in the mega city, like Dhaka, should be in our mid term plan.

At the same time, electric powered public buses or natural gas powered transportation should be introduced in the public transportation system in all the major cities in the next five years.

TRAFFIC MANAGEMENT

Traffic mis-management in cities of Bangladesh is a major cause for traffic jam and also pollution. The two key players involved in this case are the City Police and the Town Planners. Despite policies, rules and regulations, the police force has failed to impose penalties under the law on traffic violators. The emphasis was on 'papers and documents' and not on violations of traffic rules.

Traffic rules must be imposed on all motorised and non-motorised vehicles plying in a city. Police should emphasis penalising traffic rule violators more severely.

Motor vehicle rule should be updated with heavier penalties on violators of traffic rules and forging of documents (driving licences, fitness certificates, etc.)

City planners, at the same time, did not consider the basic principle of traffic management while planning for expansion of the cities. This include

- Artery-roads for the city – maintaining North-South and East-West or circular artery-roads are a must for reducing traffic jams.

City planners must plan and establish a road network for the city.

Plying of non-motorised vehicles along with motorised vehicles in the same lane, significantly slow down the traffic and contributes to the level of pollution. City should introduce some rickshaw-free roads each year.

- Development of multi-storied shopping complexes, housing, etc. without adequate provision for parking and service lanes. City planners have failed miserably in this regard and so the pockets of traffic congestions have developed in many parts of the city.

City planners must maintain the Floor-Area-Ratio (FAR) rules before allowing constructions of multi-storied buildings for any purpose.

- Inadequate parking facilities in developed area of the city – Dhaka city planners again failed to comprehend the increasing flow of traffic for a city of 80000 people per square kilometer and so lack of parking spaces has become a major problem for some parts of Dhaka.

Adequate parking spaces in the cities must be identified and metered parking / monthly-parking permits should be introduced in large cities.

- Bad management of traffic rules – city police has failed to implement the traffic rules. In the recent past, military forces had to call in to tackle the problem. Police has even failed to implement the basic rules related to management of intersections. Pick-ups and drop-offs near intersections have made intersections as one of the most polluted places in the cities. In the past few years, we have seen that army were called in to maintain traffic in city roads. In many places, local shopkeepers had to intervene regularly to clear traffic jams. These have shown the inability of the Police force in managing traffic rules on roads and highways in the cities.

Citizen groups, local residents should be empowered to maintain parking rules in their locality.

Officers of BRTA, City Corporations, and Municipalities should also be empowered to issue tickets against traffic rule violators along with the police.

- Pedestrian paths, street vendors and constructions – inadequate and unclean pedestrian paths force the millions of walking population of Dhaka to use roads for walking. At the same time, in places where adequate footpaths were constructed but street-vendors and construction companies are using them. These activities are illegal and yet both the City Corporation and the Police Force have failed to stop them.

Heavy fines should be introduced against construction companies for using footpaths for construction activities.

City Corporation may also think of using certain roads as vehicle free for a period of the day.

Number of street vendors should be regulated and they should be allowed to operate under incenses. In this connection, alternate locations should be proposed for their use in a week.

FUEL ADULTERATIONS

Quality of fuel is a major cause for air pollution in Dhaka. Dhaka is one of the few capitals of the world where open sale of lubricants and gasoline is allowed. Total number of vehicles registered in Bangladesh is nearly

Good quality fuel, less use of lubricant, properly tuned engines can reduce such emissions. Smoke traps can be installed. However, the best alternative is to switch to CNG driven vehicles.

MONITORING OF EMISSION

As yet, there is no environment quality standard for motor vehicles in Bangladesh. This must be introduced and a regular monitoring of emission level through a decentralised network of check-up stations will help improve the compliance. Existing system of issuing fitness certificates by BRTA offices only has proven to be ineffective and is prone to corruption.

We should encourage private operators to provide fitness certificates and keep BRTA office as a watch-dog. As a result, BRTAs primary job will be to monitor the operators of fitness certificate centres and not operators of every vehicle.

CATALYTIC CONVERTER AND DIESEL PARTICULATE FILTER

As a result of introduction of lead-free fuel for petrol driven vehicles, we can now introduce the use of catalytic converter is mandatory for all newly imported cars, jeeps etc. This will significantly reduce of suspended particulate matters in air. Similarly, diesel vehicles should be equipped with diesel particulate filter for this.

At the same time, government should announce a gradual conversion of the existing vehicles with catalytic converter and particulate filters. This process shall have a time frame. To provide incentive for such conversion, government may use fee/tax reduction while obtaining fitness certificate.

ALTERNATIVE TRANSPORTATION – MONORAIL / AIRBUS / UNDERGROUND RAIL

To avoid traffic congestion in Dhaka city and well as to prepare Dhaka as a mega city of the world, it is suggested that the question of introducing freeways and monorails be examined. At the same time, introduce more good quality buses in all major routes in the city.

ALTERNATIVE FUEL – CNG

To save millions of people from health risk, there is not alternative than switching to 'cleaner' fuel. In this regard, Bangladesh is lucky and CNG is a cleaner fuel compared to other imported fuels. So, the issue of switching over to CNG is a critical one.

Based on the "Polluter Pay Principle", the government can impose a "pollution tax" on the petrol and diesel to: (i) discourage consumption of fuel, (ii) to raise fund that will be used subsidising setting up new CNG stations that requires more between Tk 10 to 15 million of initial investment. The idea is to collect "sin tax" and use that money to subsidize a project that will benefit the entire urban population.

Waste Management

Waste management will become a major problem in all urban cities of Bangladesh. This is because of (a) increased pace of urbanization, (b) changes in the pattern of consumables by urban households and (c) insufficient capacity of waste removal by the municipalities and city corporations. Most municipalities also lack effective means to guarantee daily removal of wastes and overall there is a major problem of monitoring wastes. Estimates have shown that per capita garbage disposal is near 0.5 kilogram in major urban locations in Dhaka (BBS, 1997). While the municipalities and the city corporations are mainly responsible for disposal of garbage severe problems persists in removal of garbage for the following reasons:

- Organic and inorganic garbages are not separated at source and so dumping of these garbages in the landfill sites is becoming risky as the risk of groundwater contamination increases.
- Some of the toxic and hazardous components of the wastes, particularly hospital and industrial wastes while mixed with household garbage increase the risk of spread of diseases.
- Untreated liquid garbage once dumped into the open water bodies destroys the fish habitat and some of its toxic components may eventually go into the human food chain.
- Collection of household garbage by the city corporations and the municipalities are insufficient and so a large percentage (often more than 50%) of the garbage is left on city streets. These eventually find their way into the city drainage lines and in the sewage system and are responsible for waterlogging in many cities.

However, some success in the collection of household wastes should be noted. These are mainly administered by local residents, organised local communities or associations, and also some NGOs. The success in this area should be capitalised and so efforts in one area should be duplicated in other areas. The *Kalabagan* method of waste collection from households and the work of *Waste Concerns* are some examples where private and voluntary institutions were successful in building up a 'clean neighbourhood'.

To deal with the problem of waste management, following actions are suggested:

Separation of toxic/ hazardous components of hospital/ industrial waste for appropriate treatment and hospital wastes should be disposed off using environmentally safe technology.

Introduce area-based primary collection from the households by NGOs and Community organisations in all build-up residential areas.

Promote recycling and resource recovery both at the industrial level and at the household level.

Promote secondary collection and transportation of garbage by private and voluntary organizations.

Establish Sanitary landfill sites.

Arsenic in Drinking Water

Out of estimated 4.6 million Tube wells in the country, 27% or 1.5 million have Arsenic > 0.05 mg/ litre or 50 ppb. Nearly 28 million people are considered exposed to the risk of disease as

they are drinking water with Arsenic above the safe limit (> 50 ppb). These have reduced the safe water supply coverage has been reduced from 97% to 75% during the past 5 years. And so far, more than 10,000 arsenic affected patients identified so far. The following figure shows the percent of tubewells with arsenic level above the same limits in selected areas of the country.

Spread of disease has caused havoc in many parts of the country and families with arsenic affected patients are considered 'unwanted' in many rural areas. Arsenic mitigation should be high priority. The problem needs both short term and long term measures. First, a short term measure to deal with affected people and to deal with potentially affected people in Bangladesh. Second, a long term measure to deal with the hydro-geology of Bangladesh and to improve the level of arsenic contamination at the aquifers.

The short term measures include:

Establish effective co-ordination among the bodies dealing with arsenic problems to help the patients and to rehabilitate them socially.

Co-ordinate action plan on arsenic mitigation.

Promote safe water technologies and educate people on these.

Arrange treatment of arsenic affected people

The long term measures include:

Reducing groundwater withdrawal in the dry season and particularly for irrigation purpose.

Promoting use of surface water for agricultural and household use.

Promoting the traditional approach of 'drinking water pond' in rural areas and help people in the maintaining the quality of water in these ponds.

Allowing maximum recharge of the ground water table and preserve lakes and other water bodies in cities.

Water pollution

Water pollution is a major problem in most parts of Bangladesh. The nature of the problem varies between regions and locations. For example, major urban water pollution is linked with disposal of untreated industrial wastes in the rivers and lakes and major rural water pollution is linked with open-air latrine by the rivers and creeks.

Major rivers by the cities like the *Buriganga*, the *Karnafuly*, the *Surma*, the *Korotoa*, the *Rupsa* are heavily polluted rivers. Most of the pollution in these rivers originates from industrial discharge of untreated liquid wastes. Pollution in rivers creates a major health risk and the financial cost is quite heavy. The severity of the problem should be understood clearly. For example, DWASA has estimated that within the next 50 years period, water from the *Sitalakhya*, the *Buriganga*, the *Meghna* will be so polluted that the city will need water from the *Jamuna*. This projection clearly shows the cost of pollution.

Disposal of untreated sewage as well as industrial wastes should stop immediately.

Government should take steps to clean-up major rivers of Bangladesh.

WASA should be held legally responsible for non-compliance of drinking water standards set by the Department of Environment.

Municipalities / Industrial Authorities / EPZAs – the licensing authorities of industrial units – should be held legally responsible any violation of water quality standards set by the Department of Environment in water bodies. These authorities should also be held responsible to ensure removal of solid and liquid wastes in environment friendly manner.

Tighten the grip of the Department of Environment on compliance of environmental quality standards on existing industries.

Open-air defecation in rural areas is a major cause for deaths related to water-borne diseases. This is also true in many cities. Considering the risks involved in terms of public health, government should come-up with action plans. In this connection, we should note the success of similar programs in health and education.

Concept of 'Model Village' in terms of sanitation quality should be introduced as a program of action in rural areas.

WETLAND MANAGEMENT

Wetlands are key for maintenance of our rich biological heritage. Haors and Beels, a unique ecosystem, are being threatened due to both human activities as well as natural causes. Of the major activities in the haors, crop production generates the maximum pressure on it. This, however, is not to say that haors cannot be used for crop production but to focus on the fact the indiscriminate use of fertiliser and pesticides are gradually killing the biodiversity in the haors. Few of these haors are also designated as protected areas.

The mangrove ecosystem in the coastal belt is another pride collection of our rich biological heritage. It is now an integral part of the world heritage sites. Sundarban is being pressurised by human actions to collect honey, wax, timber, fuel wood, fish and leaves. The ecological conditions of Sundarban are deteriorating due to over fishing and over extracting its resources.

Besides, there are numerous rivers, khals and other wetlands in Bangladesh. Management of these wetlands in a sustainable manner is a key for our success in future. Most wetlands are under public ownership and are 'open access' areas. Consequently, it is natural to observe over-extraction of resources and degradation of the wetland ecosystems. Wetland productivity and biodiversity are declining all over the country.

Issues

The main problem of management of wetlands is the existing tenurial arrangement. During the wet season, wetlands are leased out for fishing, but in the dry season irrigated agriculture is practiced. Typically, HYV rice is grown (locally called Boro rice) with fertilizer and pesticides, both of which cause water pollution. Pesticide residues enter into food webs and cause bioaccumulation. Further, many wetlands are being completely drained out for agriculture. As a result, many species of indigenous fish and aquatic creatures (frog, turtle, snake etc.) are rapidly vanishing from rural Bangladesh. One estimate says that 54 out of 300 species of local fish species are at risk because of mismanagement of our wetlands.

Significant impacts are also created by flood control and irrigation structures all over the country. These structures block the natural migration routes (e.g., from river into flood plains and haors

during the pre-monsoon months and vice versa during the post-monsoon months) of fish during the breeding season. Statistics show a significant decline in the open-water fish catch over the years due to the combined effects of the problems mentioned above.

Finally, wetlands are also being permanently converted into all season agricultural land or being encroached upon due rapid urbanisation. This means practically irreversible damage to aquatic ecosystems.

Actions

The policy suggestions for improving the scenario are

Fish sanctuaries should be set up within the haors and beels and also in some key locations in the rivers to create a safe haven for spawning of various fish species.

Sanctuaries shall also protect birds and other animals in the area.

Leasing of wetland for commercial fishing shall be linked with a quota on maximum allowable catch and maintaining the appropriate quality of water as a fish habitat.

Heavy penalty for introduction of harmful impacts of Alien Invasive Species (AIS) shall be imposed. In this connection, aqua-culture activities shall be monitored by the Department of Fisheries to avoid possible 'escape' of AISs to the neighbouring open water bodies.

Shrimp farms in the coastal areas must be monitored in terms of their impact on environment.

Use of wetlands for oil and gas exploration increases the risk. Consequently, exploring companies must ensure that the appropriate and effective precautionary and preventive measures are taken while searching for oil and gas in wetlands.

FORESTRY

Forest management needs to be organised to encourage 'social forestry', 'home forestry'. At the same time, management of Parks and management of commercial forestlands must be separated to ensure that officers involved maintain the standard of its management.

Management of the Parks shall be closely linked with developing eco-tourism activities. Facilities shall be developed in the parks and with the help of the local people to make tourism a viable industry in the country. Involvement of local people in tourism activities is a must to guarantee a long term sustainability of these parks.

At the same time, forest management for commercial purposes shall also ensure a reasonable replace of trees to make the forest sustainable. In this connection, the forest department shall do a complete commercial analysis of forests in terms of production, costs and returns. However, it is crucial that we increase the number of parks to provide safe haven to the indigenous animals of our forestlands.

Ecotourism in national parks should be encouraged and for this proper training of the operators by the government are essentials. Dos and Don'ts in parks should be clearly monitored by the Forest Department.

Facilities inside national parks must be developed by the Forest Department to cater to the needs of growing number of eco-tourists from inside and outside Bangladesh.

Collection of forest products must ensure following the practice of sustainable management.

Sanctuaries and other reserves must remain off-limit to visitors.

Local people, indigenous to the ecosystem, must be involved in the management scheme of the parks for tourists.

NATURAL DISASTERS

Floods and tropical cyclones are the two major natural disasters in Bangladesh. Seasonal flooding is a recurrent phenomenon in the country. About 22 percent of the land area is flooded in the wet season even in a normal year, and about 60 percent of the country are considered flood prone. Since 1954, Bangladesh experienced catastrophic floods (inundation over 33 percent of the country) in five years: 1955, 1974, 1987, 1988 and 1998.

In recent years, two major floods occurred in 1998 and in 2000. 1998 flood is the longest flood in the history of Bangladesh. Here, the water level did not recede for a long time (flooding in Dhaka started in the 3rd week of July and continued till the 3rd week of September. The figure above shows the extent of flooding throughout Bangladesh.

Tropical cyclones, originating in the southern Bay of Bengal, strike the coast of Bangladesh in the months of April-May and October-December. Cyclones are generally associated with storm surges of several meters in height, which, in fact, are mainly responsible for major devastation in terms of loss of life and damage to property and infrastructure. In recent years, two massive cyclones hit Bangladesh - one on 12-13 November 1970 and another on 29 April 1991. The former killed about half-a-million people, but in the latter - though more severe - loss of human life was lesser due to warning signals and disaster preparedness.

Existing policies

The institutional responsibility for natural disasters is assigned to the Disaster Management Bureau under the Ministry of Relief and Rehabilitation. The Act, the Policy and the Plan for disaster management are in draft form, and are in process of finalization. However, the Standing Order on Disasters - revised in 1999 - is a comprehensive document that outlines management activities, at all levels and by all partners, during normal, emergency and post-emergency periods.

The Cyclone Preparedness Program of the government is, so far, aimed at minimizing loss of human life and property through building public awareness, warning and providing protection in cyclone shelters. Since 1960s, nearly 2000 cyclone shelters have been constructed along the coast. However, the capacity of these shelters in terms of protecting the local people is very minimum. At the same time, death of animals, both domestic and wild, have so far been ignored.

Current flood prevention measures including structural interventions like embankments (over 8000 km in length), drainage improvement and river training works – did not yield expected

results due to inadequate or poor operations and maintenance activities. Management of these infrastructures are not yet designed to ensure participation by the people of the locality.

The Flood Forecasting and Warning Centre (established in 1972) of the BWDB that collect rainfall and water level data and provide forecasts for flood forecasts is yet to deliver the goods to the public. In this connection both accuracy in forecasting and dissemination of information are essential ingredients for their success.

One of the tectonic faults passes through Bangladesh. So there is a risk of earthquake. At the same time, construction of high-rise buildings in the cities has increased risk of damages (both human life and cost of property damages) due to an earthquake. The government cannot ignore this any more.

Actions

Construction of cyclone shelters should receive priority with an aim to provide protection to at least 80 percent of the high-risk population in an area. The recommendations of the Multipurpose Cyclone Shelter Plan of 1992 can provide directions for implementation.

All shelters must be equipped with facilities to provide a decent living for the people living during disasters.

Government shall take steps to review existing flood protection embankments for the shortcomings and inadequacies and take measures to remove them.

To manage the flood protection and irrigation infrastructure, an appropriate management structure shall be developed so that it guarantees public participation both in selecting locations for any new embankment as well as in sharing the costs of its operations.

The 1998 flood has shown the weakness in our current structural protection plan of Dhaka city. Consequently, embankments in all major and secondary towns to prevent urban flooding must be maintained and water level within the protected area must be monitored to prevent any future disasters. At the same time, the eastern side of Dhaka City shall be protected to reduce damages of properties and resources. An embankment along the Balu river is, therefore, recommended.

Recent floods have shown the inherent weakness of our existing flood forecasting system. It is not possible for people to understand the true picture of the flood from the existing warning messages. Consequently, it is strongly recommended that localized flood-warning languages be used to alert people on the upcoming floods.

Government should authorize local governments to monitor compliance of building codes during constructions to minimize life and property damages during a earthquake.

Government should actively consider introducing 'disaster insurance scheme' to prevent a sudden collapse of the economy in case of a natural

disaster. This will help the government to quickly rebuild the economy after disasters.

WATER SUPPLY

Although Bangladesh is a riverine country, its water supply has remained very vulnerable for many reasons. Many parts of the country suffers from critical shortage of water for agricultural production (see Volume 4, Task Force Report 1991). However, in the last decade, it is the supply of drinking water that has become a critical issue for the nation.

- Dhaka WASA and Chittagong WASA supply only between 60-65 percent of the total daily demand for drinking water.
- Rural Bangladesh is increasingly lacking in terms of a good source of water for drinking purpose. Studies have shown that a large part of rural Bangladesh is now exposed to high level of arsenic in the ground water from the shallow aquifer (see figure below).
- On average the groundwater table in many parts of Bangladesh is being receding by 1.5 meters per year.
- And finally bacterial contamination of water supplied through the WASA and other agencies is very high. This has contributed to excess use of fuel for boiling water in every household living in urban locations.

Actions

The general recommendations for improving the water supply in the country are as follows.

Encourage policies to reduce dependence on ground water for supply of water. This is a depletable source and it will not be a sustainable one.

Promote use of surface water for drinking purpose and for this, initiate policies like 'one village one pond' to ensure arsenic-free drinking water to every household in rural Bangladesh.

To improve the quality of water in rivers, government should undertake a clean-up drive in the rivers like the Buriganga, the Sitalakhya, the Turag, the Karnaphuli, the Surma, the Rupsa etc.

To improve monitoring of water quality so that actions can be taken before a complete destruction of water sources, government should establish an effective EMP (Environment Monitoring Program) involving representative from the civil society.

ENFORCEMENT

Most of the discussions above included some details on enforcement of the law. For environment the following institutions are directly involved for implementation of the laws and regulations.

- Department of Environment – under the Environment Act 1997, DoE is responsible for maintaining the quality of our environment. It has been given powers to regularly monitor and regulate polluting industries. So far, their actions are limited only in providing certification and authorisation for setting up industries.

The quality of enforcement of the DoE must be improved dramatically so that they can be the national watchdog on environment.

- Department of Agriculture – is responsible for development of agricultural sector in the country. Given the threat posed by GMOs and LMOs, DoA should develop a clear policy in dealing with this new threat.

The objective of the department of agriculture should be broadened to include implementation of sustainable strategy of management of agricultural production.

Crop rotation as a strategy of sustainable production must be encouraged among the farmers.

Department should encourage and educate farmers on organic farming and method of production with minimum use of pesticides and fertilisers.

- Department of Forests – under the Forest Act (amended up to 2000) this department is responsible for managing forests and parks. The performance of this department is less than satisfactory in terms of maintaining the forests.

Forest Management and Management of the Parks should be separate under two directorates. The job of the Forest Department should be to ensure sustainable management of forests and the job of the Parks Department should be to ensure conservation of the nature.

- Department of Fisheries – under the Fisheries policy, this department is responsible for management of all open water fisheries. Fisheries department is yet to show that they are in charge of regulating production of fishes from open access waterbodies like the rivers, lakes and oceans.

The objective of fisheries management should be to ensure sustainable harvest of open water fishes.

- Water Development Board – this board is responsible for management of all structures in and around the lakes and lagoons and maintenance of embankments, barrages, etc. The major objectives of these structures were flood control, irrigation and drainage. So far, public participation in management of these structures was less prominent in the actions of the WDB.

Ensuring public participation in the management of the flood control, irrigation and drainage structure should be emphasised.

- Municipalities, City Corporations, City Development Corporations, RAJUK, etc., are also involved in controlling resources and maintaining the quality of the environment. We have discussed their roles in sections above.
- Environment Court – under the Environment Act, environment courts are expected to be setup in several locations where environment related litigation will be tried. Government is yet to set up these courts and it is not yet clear whether legal actions can be taken against the institutions that have failed in their authority to safeguard our environment.

EDUCATION AND AWARENESS

Education and awareness on environment are essential part of sound ecological management. In this, Bangladesh has, at least, claim some success than the government. Media reports on environment have increased over the past years. Formal education has already included courses on environment as a part of the curriculum. Non-formal education has also included environmental awareness in the curriculum.

At the same time, a large number of NGOs are involved in terms of building awareness on environment among the public. Some are involved in training, some in disseminating information and others are more directly involved in managing local resources using environment friendly technologies.

INTERNATIONAL ISSUES RELATED TO ENVIRONMENT

As a member of international community and as one of the most environmentally vulnerable country, Bangladesh has become party to many of the ICTPs (see Annex III for the inventory of the 45 ICTPs) on environment. Considering the socio-economic activities and the geographical location of the country, the most important ICTPs can be identified as follows:

- a) Convention on the Biodiversity (CBD) 1992 (ratified by Bangladesh on 3 May 1994).
- b) Framework Convention and Climate Change (FCCC) 1992 (ratified by Bangladesh on 15 April 1994).
- c) Ramsar Convention on Wetlands of International Importance, 1971 and amended in 1982 and 1987 (Bangladesh has become Party to this convention on 21 May 1992 after the Sundarban is declared as a Ramsar site)
- d) Convention on the Control of Wild Flora and Fauna, (CITES), 1973
- e) Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, 1989 and the Amendments of 1995 (Bangladesh ratified this on 1 April 1993).

Convention of Biological diversity (CBD)

CBD deals with environment using a holistic approach. Convention on Biological Diversity (CBD) was adopted at the Earth summit, in Rio de Janeiro, Brazil in 1992 and came into force in 1993. The objectives of CBD are conservation of biological diversity and sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.

POSITION OF BANGLADESH ON CBD

Bangladesh is rich in biodiversity. The country has about 113 species of mammals, over 630 species of birds, 125 species of reptiles and 22 species of amphibians. It has 260 freshwater species and 475 marine species. Based on the available information, other faunal species include 327 mollusks and 66 corals. Status of insect species is not available but it is reported to be highly diverse.

Bangladesh has been the abode of 5000 angiosperm species and several subspecies. Of them 160 species are used as crops. The crops are rice, wheat, jute, pulses, oilseed plants, minor cereals, sugar crops, fruit plants, vegetables, root rubber crops, spices, forest trees, beverage crops, flowers, medicinal and aromatic plants and other wild plants.

Rice grows throughout Bangladesh which has 30 agro- ecological zones. During 1910 to 1925 about 2000 Aus, Transplanted Aman and deep water traditional rice varieties were collected out of which 800 were deep water rice. By 1960, the collection of indigenous rice varieties rose to

about 3000. During 1979-80 , a total of 12479 names of rice were listed by a survey in the country.

Bangladesh has signed, ratified, accepted and acceded to CITES, World Heritage Convention, Ramsar Convention, CBD, Climate Change Convention and Convention to Combat Desertification. Thus it adheres and commit to the conservation of biodiversity and the environment. Since signing and ratification of the CBD respectively in 1992 and 1994, the status of implementation of CBD in Bangladesh can be measured on the following activities as outlined against the concerned issues explained in the articles of the CBD.

Bangladesh faces the Bay of Bengal in the south and has international border with India in the west, north and northeast; and Myanmar in the southeast. It has very similar biodiversity both in ecosystem and species with the above two countries. Till date Bangladesh has not been able to identified any issue in respect of constraints of biodiversity conservation.

- As yet except for the Ganges water treaty, Bangladesh has not signed any other agreement with its neighbours for conservation of resources. However, a common approach for conservation of Sundarban in Bangladesh and India is being studied by researchers and international organisations.
- The Ministry of Environment and Forest imposed this moratorium in 1989 for a period of 10 years. In 1999, Bangladesh has extended its initial moratorium on logging of trees for another 10 years.

Harvest of economic resources is not prohibited even if the site is marked under CBD. It is important the Forest Department develop a guideline for collection of resources from these 'reserves' for its sustainable management.

- Bangladesh has *ex situ* gene bank facilities. An important gene bank has been established for conservation of rice genetic resources is located in the Bangladesh Rice Research Institute. This bank has so far collection of 4523 varieties of traditional rice and including exotic varieties. It has a total of 7439 collection of rice varieties.
- Under the national conservation strategy implementation project Bangladesh is preparing a management plan in its two biologically rich and intensively used ecosystems: i) Tanguar Haor, located in the northeast region of Bangladesh and ii) Southeast Hill Forests and the Narikel Jinjira (St. Martins) island.
- Ministry of Fisheries and Livestock has implemented the fisheries management project. Bangladesh Agricultural Research Council (BARC) is an agency responsible for coordination of research for conservation of biodiversity in the country. It also assists for preparation of Policies, Acts and Guidelines in agricultural sub-sector of the agriculture sector. This agency has assisted drafting of the bio-safety rules for approval of the competent authority.

One of the components of CBD is to create conditions for facilitation of access to genetic resource for environmentally sound uses by the CPs and not to impose restrictions. Here Bangladesh lacks sufficient information. Consequently, it remains vulnerable and may fail to protect its own genetic resources under TRIPs.

Framework Convention on Climate Change (FCCC) and the Kyoto Protocol

- The Framework Convention on Climate Change (FCCC) was adopted in New York, USA in 1992 and given effect in 1995 (March). Bangladesh signed the Framework Convention at the Earth summit in Rio de Janeiro, Brazil in 1992 and ratified it 1994.

- Under FCCC several rounds of negotiations started in the world to work on a strategy to limit emission of green house gases to a safe limit and at the same time ensure sustainable economic growth. At the first UNFCCC Conference of the Parties in Berlin in 1995, the Contracting Parties reviewed the commitments by the developed countries under the Convention and decided that the commitment to aim at returning their emissions to 1990 levels by the year 2000 was inadequate for achieving the Convention's long-term objective. The Conference adopted the "Berlin Mandate" and launched a new round of negotiations on strengthening the commitments of the Contracting Parties from developed countries. At the third Conference of the Parties in Kyoto in 1997, the Parties adopted the Kyoto Protocol.
- In the Kyoto Protocol, Contracting Parties from developed countries are committed to reducing their combined greenhouse gas emissions by at least 5 per cent from 1990 levels by the period 2008-2012. The targets cover the six main greenhouse gases, namely, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆), along with some activities in the land-use change and forestry sector that remove carbon dioxide from the atmosphere (carbon "sinks"). Each Contracting Party from developed countries is required to have made demonstrable progress in implementing its emission reduction commitments by 2005.
- The Kyoto Protocol also establishes three innovative mechanisms, known as joint implementation, emissions trading and the clean development mechanism, which are designed to help Contracting Parties included in Annex I of the United Nations Framework Convention on Climate Change to reduce the costs of meeting their emission targets. The clean development mechanism also aims to promote sustainable development in developing countries. The operational details of these mechanisms are now being fleshed out by the Contracting Parties.
- Sea-level rise following global warming is predicted to inundate as much as 24% of the flood free land and 19% of the medium high land of Bangladesh. Sea level rise will also cause intrusion of saline water damaging fresh water ecosystem, destroying bio-diversity and affecting both dry season and monsoon crops. The frequency and intensity of natural disasters like storms, cyclones and droughts are predicted

Climate change is a global problem requiring a global solution and Bangladesh should actively participate in all rounds of negotiations under FCCC and the Kyoto Protocol to pursue a global principle for not only reducing emissions of green house gases but also in preparing principle of compensation in case of disasters.

Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973 (CITES)

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement that aims to protect trading of threatened animals. CITES was drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN (The World Conservation Union). The convention was finally agreed at a meeting of representatives of 80 countries in Washington DC., United States of America, on 3 March 1973, and on 1 July 1975 CITES entered in force.

- The success of CITES can be stated in the following words, 'Not one species protected by CITES has become extinct as a result of trade since the Convention entered into force and, for many years, CITES has been among the largest conservation agreements in existence, with now over 150 Parties'.
- Because the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international co-operation to safeguard certain species from over-exploitation. CITES was conceived in the spirit of such co-operation. Today, it accords

varying degrees of protection to more than 30,000 species of animals and plants, whether they are traded as live specimens, fur coats or dried herbs.

Basel Convention on Movements and Disposal of Hazardous Wastes, 1989

This Convention was adopted in 1989 and came into force in 1992. Bangladesh signed this convention in 1993. The Basel Convention aims to reduce transboundary movement of Hazardous to a minimum level and to ensure environmentally sound and efficient management of such wastes as close as possible to the source of generation.

Bangladesh has published a 'Regulatory Framework on import of hazardous and toxic materials' in 1997. In 1994, the department of environment with funds from WHO organised a training programme on 'toxic chemicals and hazardous wastes' and 'Risk Assessment and Management. WHO consulted has also prepared a 53 position paper on use of toxic chemicals and disposal of toxic and hazardous waste in Bangladesh.

Ramsar Convention, 1971

The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty. This convention has been amended twice. Once in 1982, the Paris Protocol and next in Regina when Articles 6 and 7 were amended. The convention provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. There are presently 125 Contracting Parties to the Convention, with 1075 wetland sites, totaling 81.76 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance.

The Convention on Wetlands came into force for Bangladesh on 21 September 1992. Bangladesh presently has 2 sites designated as Wetlands of International Importance, with a surface area of 605,500 hectares.

Actions

The review the obligations and activities linked with the ICTPs suggest that Bangladesh lacks very much both in terms of follow-up actions as well as in its ability to monitor the obligations on Bangladesh following the ratification of the agreements, protocols and conventions. Most of these ICTPs use Conference of Parties (COP) to monitor, implement and account for responsibilities and obligations under the treaties. Our participation as well as position presented in these COP meetings was very weak since it did not follow any systematic records. As a result, we have failed to benefit from the projects. In this regard, the following recommendations are given:

Institutionalise the process of participation in COPs using a focal point at the respective ministry or directorate.

Constitute Expert Committee for each of the ICTPs to formulate Bangladesh's position in these meetings and the delegation must include a member from the expert committee to respond to the specific queries during the conferences.

When negotiations continues for several years, ensure that a single team consisting of representative from the Ministry(s) and the Expert Committee always attend such meetings. In case of transfers of any officials from the Ministry, the same person must be called back to attend such negotiations.

Support implementation of CDM and a mechanism for transfer of environment friendly technologies to developing countries should be given priorities during each rounds of negotiation.