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## ENVIRONMENT AND SUSTAINABLE DEVELOPMENT IN BANGLADESH

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Bangladesh is facing several major environmental problems arising, *inter alia*, from population pressure, lack of development and the consequences of development process itself, including human intervention on natural system inside and outside its territory. The problems are: land degradation and depletion of natural resources, degradation of soil condition and fertility, natural disasters like floods, droughts, cyclones and storm surges, climatic changes and sea level rise. Nowadays the consequences of environmental hazards are also being felt increasingly in Bangladesh like other developing countries. But, the database on these problems and their likely implications for Bangladesh at present is too scanty. Some tentative conclusions have been drawn regarding the possible changes in storm frequency and severity, sea level rise and flooding of coastal areas of Bangladesh, which would be explicitly catastrophic for Bangladesh. However most of this conclusion are speculation. Hence, a study on the linkage between environment and sustainable development in the context of environmental problems of Bangladesh could contribute not

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only to the database, but also to generating more academic interest and public awareness, and to public policy formulation.

The present paper aims at elaborating the concepts of environment and sustainable development, and establishing a linkage between them in the context of development imperatives of Bangladesh. The paper highlights the state of environment, causes and consequences of environmental degradation in Bangladesh, which occur at the extreme interface of natural phenomena. The objective is to bring out the nature of integration of development programme and environmental degradation. An attempt is made to focus on the initiatives taken to face the environmental disaster in Bangladesh. Finally, some recommendations are also put forward to take an integrated approach to maintain sustainable development. For the purpose of analysis, the study has selected a set of environmental issues, which constitute the overall environmental conditions of the country.

The paper has been split into five sections. The first section deals with the concept of environment and sustainable development. The section also attempts to establish a linkage between environment and sustainable development. The second section briefly traces the present environmental scenarios of Bangladesh with reference to geographical setting of the country. The third section studies the possible global climatic changes and their implications for Bangladesh. The last two sections deal with the initiatives taken to face the challenge, and the approaches to prevent degradation and achieve sustainable development.

## I. CONCEPTS AND LINKAGE OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

Environment and development are inextricably linked. These issues have engaged the attention of the whole world, particularly over the past few years culminating in the holding of the Rio



Summit. At the outset, the concepts of "sustainable development" and "environment" need to be defined and elaborated. Any natural areas representing "living space" is an environment which as a habitat of man or other living species is likely to change due to the activities of the species occupying the habitat or due to external factors.<sup>1</sup> Land, water and air, which are the vital components of the physical environment surrounding the biosphere, provide the basic elements of the life support system.<sup>2</sup> The deterioration of these key components causes natural imbalance and threatens the existence of the future on earth.

The earth's resources are steadily declining due to both unscrupulous human interference, such as excessive harvesting of agricultural land, and natural depletion like degradation of forest, deforestation, expanding desert, eroding soils, over extraction of ground water sources and falling aquifers. The result has been a chain process of environmental degradation causing not only manifold problems for current generations of people, but also for the future generations. The protection of the environment is an essential prerequisite to development. Without adequate environmental protection, development is undermined; without development, resources will be inadequate for necessary investments, and environmental protection will fail.<sup>3</sup> The linkage between environment and sustainable development is, therefore, fairly obvious. Hence environmental degradation has forced the awareness among the forward-looking people to redefine the

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1. B. Bhattacharya, "Defilement of the Environment, Its Restoration and Management—Keynote Address" in M. M. Jana, et. al. (eds.), *Environmental Degradation and Developmental Strategies in India*, (Ashish Publishing House, New Delhi, 1991), p. 9.
  2. M. M. Jana, "Environmental Degradation and National Awareness—Presidential Address", in M. M. Jana, *ibid.*, p. 1.
  3. World Bank, *World Development Report 1992*, (Oxford University Press, New York, 1992), p. 2.



concept of sustainable development. Eminent environmentalist, Lester R. Brown of World Watch Institute, rightly observed that with the thresholds for sustainable yields now being crossed for so many natural systems, relationships between people and these systems that were stable for centuries or millennia, are becoming highly unstable.<sup>4</sup> So, environment and sustainable development are to be addressed in proper perspective.

Recently as a result of growing concern over economic growth and its consequences for the environment, several definitions of sustainable development have been put forward. Among these, the most widely known as well as widely debated definition of sustainable development is that of the World Commission on Environment and Development (WCED), which is more commonly known as the Brundtland Commission.

The WECD defines sustainable development as a process in which the exploitation of resources, the direction of investment, and the orientation of technological development and institutional changes meet the needs of present generation without compromising the ability of future generations to meet their own needs. It further recognizes that "unlimited growth is neither feasible nor desirable, that meeting the basic needs of all people should be the goal of development, and that only a protected and carefully nurtured environment can be able to sustain human aspiration".<sup>5</sup>

Precisely, sustainable development is development that meets the needs of the present without compromising the ability of the

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4. World Watch Institute, *State of the World 1987*, A World Watch Institute Report on Progress Towards a Sustainable Society, (W. W. Norton & Company, New York: London, 1987), pp. 4, 7-9, & 17-19.
  5. WECD, *Our Common Future*, (Oxford University Press, 1987), cited in K. F. Jalal, *Sustainable Development, Environment and Poverty Nexus*, Occasional Papers, No. 7, (Asian Development Bank, Manila, December 1993), p. 6.



future to meet their own needs. It embodies two key principles: (i) the needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and (ii) the limitation which need to be imposed on technology and economic development, when required, to protect environment's ability to meet present and future needs.<sup>6</sup> The difficulty arises when the present generation is not in a position to satisfy its own needs.<sup>7</sup> Conceptually, in countering environmental problems, issues should be treated in a holistic rather than in an isolated manner.

The causes of unsustainable development lie in several factors. The most important of them is poverty, and amelioration of poverty is a necessary and central condition of any effective programme to deal with environmental concern.<sup>8</sup> It is generally accepted that environmental decline, rapid population growth and stagnant production are closely linked with the fast spread of acute poverty in many countries including Bangladesh. Sustainable development can be visualized in terms of a water tank having two leaks, one leak being "poverty" and the other "environmental degradation". Two vicious circles: - one poverty-environment and, the other development-environment - are the main causes of unsustainable development.<sup>9</sup> Environmental degradation by different patterns of resources utilization are linked with both the vicious circles of poverty and development. High population density, low per capita income, low productivity, and low literacy rate are the characteristics of vicious circle of

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6. World Commission on Environment and Development (WECD), *Our Common Future*, (Oxford University Press, Oxford, New York, 1987), p. 43.

7. K. F. Jalal, *op. cit.* pp. 6-7.

8. Ministerial Brief, "Economic Policies for Sustainable Development", *Conference on Environment and Development in Asia and the Pacific*, 10-16 October 1990, Bangkok, p. 7.

9. For details, see, K. F. Jalal, *op. cit.*, p. 7.



poverty. This poverty situation obviously discourages to take any measures for conservation of environment, which is either capital or knowledge intensive.<sup>10</sup>

On the other hand, the failure of the institutions to undertake conventional growth activities, that take into account the regenerative and adaptive capacities of the environment and that integrate in the development process measures to balance the need for development and the need for conserving the resource base, is a characteristic of environment-development circle. The failure to realize the meaning of the environmental management is the other side of this circle, which refers to management of development activities within the assimilative capacity of the environment instead of management of the environment *per se*.<sup>11</sup>

The environmental problems that Bangladesh is facing have some relations with her stages of development, economic structure, and environmental polices. Some problems are associated with the lack of economic development and others are related to various types of degradation with poverty as the root cause. Accelerating equitable income growth and promoting necessary access to resources and technologies are the main challenges to Bangladesh for protection of environment and sustainable development. But many other problems are exacerbated by the growth of economic activity. Deforestation, overuse of water and industrial and energy-related pollution are the results of economic expansion that fail to take the value of the environment into consideration. Rapid population growth, with or without development, may make it difficult to address national problems. Thus there has been a close linkage between environment and key components of development. This can be examined in two vital aspects (i) environmental

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10. *Ibid.*, p. 8.

11. *Ibid.*, p. 9.



linkage with population and poverty, and (ii) linkage with economic growth.<sup>12</sup>

### **i) Population and Poverty, and the Environmental Degradation**

Population in Bangladesh is now growing at 2.1 %. Although the rate is down from its peak of 2.35% in the early 1980s, absolute growth is much higher in number.<sup>13</sup> This rapid growth contributes a lot to environmental damages. Traditional land and resource management systems may be unable to adapt fast enough to prevent overuse, and governments may be unable to keep up with the infrastructural and human needs of a growing population. In addition, the sheer density of population will militate against proper environmental management. By the middle of the next century, Bangladesh's population is expected to rise to 1,700 per square kilometer.<sup>14</sup> Rapid population growth can exacerbate the mutually reinforcing effects of poverty and environmental damage. Because of lack of resources and technology, land-hungry farmers resort to cultivating erosion-prone hillsides and moving into tropical forest areas. Poor families often have to meet urgent short-term needs, leading to excessive cutting of trees for firewood. This has been failing to replace soil nutrients. Higher growth of population would be seen in urban areas. Urbanization will reduce pressure on the rural environment, but it brings a number of different sets of challenges associated with industrial growth, emissions, and wastes in the urban centres, or in total environment as a whole.<sup>15</sup>

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12. For details, World Bank, *World Development Report 1992*, (Oxford University Press, New York, 1992), p. 7.

13. BBS, *Statistical Pocketbook of Bangladesh 1993*, (GOB, Dhaka, December 1993), p. 92.

14. *World Development Report 1992*, *op. cit.*, p. 7.

15. For details see, *ibid.*, pp. 7-8.



## ii) Economic Growth and the Environment

Economic growth of any country places pressure on the natural environment. A long-term projection of economic growth and its relations with environment are a major key to assess its magnitude. Under the present productivity trends, and given projected population increase, world output by 2030 would be 3.5 times what it is today, or roughly \$ 69 trillion (in 1990 prices).<sup>16</sup> If environmental pollution and degradation continue to increase in step with such a rise in output, the result would be appalling environmental pollution and damage. Bangladesh is no exception to it. Its economic growth and overall environment are closely enmeshed. The more it searches for economic growth, the more it has to become concerned for environmental hazards. Because economic growth without proper environmental considerations does not indicate real development of a nation.

## II. ISSUES OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT IN BANGLADESH

The physical setting of Bangladesh is unique. It is situated at the nexus of three of the world's mighty rivers, namely, the Ganges, the Brahmaputra, and the Meghna which all originate from the Himalayan system and flow through Bangladesh draining 2.4 billion tons of sediment into the Bay of Bengal. The striking feature of this system is that Bangladesh's territory of only 144,000 square kilometers occupies an extremely small part of the system at its lower end. Thus 93% of waters fleeting through Bangladesh come from outside its boundaries while only 7% is from within its margin.<sup>17</sup> Being at the lower end of the delta of

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16. *Ibid.*, p. 9.

17. Saleemul Huq and A. Atiq Rahman, "An Environmental Profile of Bangladesh" in A. Atiq Rahman, *et. al.*, (eds.), *Environment and Development in Bangladesh*, Vol. One, (University Press Limited, Dhaka, 1994), p. 38.



these major river systems, Bangladesh is criss-crossed by over 250 rivers which form a perplexing and ever-changing pattern as they pass through the country in a north to south direction.

In dealing with environmental problems of Bangladesh as well as the advancement of environmentally sound and sustainable development, two unique features of Bangladesh should be noted. First, the country with 120 million people is one of the most densely populated areas in the world, and contains some of the ecologically sensitive and productive areas, such as geographical location, river systems, large deltaic plain, long low-lying coastal area, monsoon climate, and tropical and mangroves forest. Second, both lack of development and the development process itself have caused and continue to cause environmental degradation. The areas and state of environmental degradation in Bangladesh are discussed below.

#### **a) Land Resources and Population**

Bangladesh, with rapid population growth provides a unique setting for population-environment linkages. With more than 120 million people and a growth rate of 2.1% in Bangladesh, the per capita shares of land and other basic natural resource are very low. While on average the nation's cultivated land is shrinking, farmland is being rapidly converted into residential and industrial use. Large areas of marginal or fallow land have already been brought under cultivation and cropping has been intensified. However, returns on such land are not only low but land use practices result in additional problems. The main causes of this degradation are reclamation of land for agriculture, over-grazing, and cutting trees for supply fuel. In addition, extensive use of chemical fertilizers and pesticides, introduction of high yielding varieties, and expansion of irrigation have played a crucial role to accelerate the land productivity. Although application rate remains low, it intensifies and causes further problems for the



environment. Desertification, salinisation and alkalisation are spreading rapidly in the north and south-western part of the country, respectively. Almost one third of the country's landmass is now facing this acute problem. Irrigation is also one of the causes of over exploitation of groundwater, salinisation and pollution.

### **b) Degradation of Soil**

Soil is an important resource in Bangladesh because of agrarian nature of agriculture. But the soil resources are under colossal threat from increasingly degraded environmental conditions. Development projects since the early sixties have continued to influence soil environment. Some of those development projects had proved to be hazardous to the soil condition. Improper land management of sloping areas of the hills, northern piedmont plain and closely dissected areas of the Madhupur tract soils are now causing severe erosion. Denudation of forests for cultivation and unscientific land management in these areas have accelerated erosion on the topsoil with the run-off from high monsoon rain. Consequently, infertile soils have come up to the surface. In addition, the soil particles moved down with the run-off silted up the beds of the rivers resulting drainage congestion and shred over the adjoining agricultural land burying fertile soils under infertile soil materials. Soil salinity in the coastal belt of Bangladesh has been developing because of continuous heap of tidal flooding and from the horizontal seepage of brackish water from the sea. Human interference has also changed the soil salinity status both in terms of extent and intensity.<sup>18</sup>

In addition, due to continued irrigation process, water logging has reduced the inherent soil fertility and decreased the bearing capacity of soils. Expansion of use of chemical fertilizer and

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18. World Bank, *Bangladesh Environmental Strategy Review*, 1991, pp. 4-8.



pesticides has created another problem by reducing optimum level of organic matter of soils particularly in the wetland rich soils. Deficiency of organic matter decreases soil fertility, increases chemical fertilizer requirement but concomitantly has reduced the benefits of farmers from fertilizers.

### c) Forest Resources

Forest is an important element of national economy, it contributes 4% to the GDP and nearly 2% to the employment sector.<sup>19</sup> Forest resources creates a micro-climate and profoundly influences most of the aspects of the environment such as soil, water and air quality, and, prevents soil erosion and siltation of river beds, reduces intensity of flood, and provides protective belts against cyclones and tidal surges. It further minimizes the adverse consequences of greenhouse gases."<sup>20</sup>

But unfortunately the forest resource of Bangladesh has been rapidly decreasing, and only about 1.2 million hectares (8% of total land) are now actually forested. Over the past 50 years nearly 50% of the forest area had been deforested at an alarming rate.<sup>21</sup> In the hilly regions, large areas of forest have been denuded through shifting cultivation. The largest mangrove forest in the world, namely, the Sundarbans is an important source of forestry products, and it provides protection against coastal erosion and cyclones. Flow of fresh water in the distributaries of the Sundarbans has gradually been reducing due to the natural shift of the channel, and has been aggravated by the construction of the Farakka barrage across the Ganges upstream, and also by the increased abstraction of surface water and ground water in the

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19. Ministry of Environment and Forest (MOEF), *Bangladesh National Report for UNCED*, (GOB, Dhaka, 1992), p. 13.

20. Omar Ali, "Trees and Environment" in A. Atiq Rahman, *et. al.*, (eds.), Vol. Two, *op. cit.*, p. 233.

21. *Bangladesh Environmental Strategy Review, op. cit.*, p. 27.



recent years. The combination of these factors may cause increasing salinity in the area and resulting in the top-dying of the Sundari trees, the dominant mangrove species which are sensitive to changes in salinity.<sup>22</sup>

#### **d) Bio-diversities**

Bangladesh has diverse biological resources from the time immemorial. The variety of species and their genetic contents in the wildlands of Bangladesh, which are otherwise called bio-diversity, are of direct human benefits in terms of environment, ecology, and sustaining the quality of life. The palaeontological evidence indicates that Bangladesh was the major faunal and floral genetical exchange ground in the world in early Cretaceous period.<sup>23</sup> Nevertheless, the loss of natural habitat is speeding up exhaustion of biological diversity at an alarming rate. Deforestation, wetland reclamation, grassland degradation, over-fishing, introduction of chemical fertilizers, modern ploughing equipments and population increase all contribute to the shrinking of the habitat for flora and fauna, thus threatening with the disappearance of many rare species.

#### **e) Water Resources and Water Depletion**

As mentioned earlier, Bangladesh is criss-crossed by over 250 rivers, which form a complex and ever changing delta as they are passing through the country in a north to south direction. All the rivers and streams constitute 24,000 km length covering 7% of country area with average 38,000 cubic meters per second water flow.<sup>24</sup> Due to the geographical location of Bangladesh, water

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22. World Resources Institute (WRI), Draft—Bangladesh Environment and Natural Resources Assessment, Washington D. C., 1990, pp. 56-78.

23. Anisuzzaman Khan, "Biodiversity in Animals" in A. Atiq Rahman, et. al., (eds.) Vol. Two, *op. cit.*, pp. 180-195.

24. Saleemul Huq and A. Atiq Rahman, *op. cit.*, p. 41.



management has become the key issue in Bangladesh's environment. The interaction zones of the 710 km-long coastal area, where fresh water from the interior and saline water from the sea meet together, have been facing major threat. Excessive use of groundwater has dipped the water table, and there have been land subsidence and increased soil salinisation in coastal areas. Shortage of water during dry season is thought to be causing the saline belt to move northward. Construction of polders and embankments has reduced or is reducing the river flows, which causes the salinity encroachment. In this connection, it is worth noting that withdrawal of the Ganges water through Farakka Barrage has catastrophic impact on lean period water availability, increased salinity and has tormented the ecosystem of the Ganges delta.

Although large engineering projects undertaken in pursuit of flood control, drainage and irrigation (FCDI) have a long history in Bangladesh, the problem of drought, mainly caused by the seasonal variance of precipitations, still persists in the country. Recent analysis reveals that fresh water of the country has been polluted to a great extent, which is becoming a major problem for living organism in water. This discharged water is transferred from rivers to the Bay of Bengal, creating a serious problem for coastal and marine ecosystem. In addition, excessive fishing in coastal belt also creates problems for the balance marine ecosystem.

#### **f) Natural Disasters: Floods, Droughts, Cyclones and Storm Surges**

Due to the recurrence of disasters, Bangladesh is now known as a disaster-prone country. The physiography, morphology, position at the apex of the Bay of Bengal, and other natural conditions have made her vulnerable to disasters and environmental hazards. Floods, droughts, cyclone and storm surges, nor'westers and tornadoes, desertification and river bank



erosion are the major events of the natural disasters in Bangladesh. The economic development of the country remains under threat because of these environmental hazards. These are basically seen in three areas:

(i) **Floods** : Flood has become a perennial feature in Bangladesh due to its geographical location at the lower end of the Himalayan river system and at the apex of the funnel shaped Bay of Bengal. Seasonal flooding in Bangladesh is common in every year and traditional settlements and cropping system are well adapted to it. Some 30 to 35% of the total land surface is flooded every year during the wet monsoon.<sup>25</sup> Among the disasters flood is the single most critical environmental issue which brings untold miseries to millions of people almost every year. The peculiar geographical location of the country has subjected her to these floods from the time immemorial. General low topography of the country, rainfall in up-country and in-country, river systems and morphology, deforestation in the Himalayan range, river siltation, synchronization of the major river-peaks and human intervention i.e., construction of unplanned road, flood embankment are the major possible causes of floods in Bangladesh.<sup>26</sup>

ii) **Drought** : Drought is a global phenomenon and has occurred throughout human history. In Bangladesh drought mostly occurs during the pre-monsoon and post-monsoon times and causing severe damages, especially to agricultural production. Drought, i.e., inadequate or no rainfall for an extended period, causes hydrological imbalance and water shortage and crop damage.

25. M. Hossain, *et al.*, (eds.), *Flood in Bangladesh—Recurrent Disasters and People's Survival*, (University Research Centre, University of Dhaka, Dhaka, August 1987), p. 104.

26. For details, M. A. H. Pramanik, "Natural Disasters", in A. Atiq. Rahman, *et al.*, (eds.), Vol. Two. *op. cit.*, pp. 143-149.



iii) *Cyclone and Storm Surges* : Technically, a cyclone is an "area of low pressure" where strong winds blow around a centre anti-clockwise in the northern hemisphere and clockwise in the southern hemisphere. Tropical storms are called hurricane in the West Indies and the Atlantic coast of America; typhoons in the Far East and cyclones in South Asian Sub-continent.<sup>27</sup> The Bay of Bengal is the breeding place of catastrophic cyclones, causing immense loss of life and property during pre-monsoon and post-monsoon. A series of cyclones has occurred in the Bay of Bengal and hit Bangladesh in the last several years. The most recent devastating cyclone of 1991 has caused colossal loss of life and property, and made tremendous pressure on the national economy of the country. In addition, natural disasters like cyclone disrupt all the efforts of development activities by damaging physical infrastructure.

#### g) Pollution Problem

Industrial disposal is one of the major sources of environmental pollution. Although the sector is not yet developed, at present the manufacturing sector accounts for about 10.5% of GDP and 8% of total employment.<sup>28</sup> The major sources of industrial pollution are the tanneries, fertilizer factories, rayons, pulp and paper and distilleries. Environmental considerations were not taken into account adequately at the beginning of industrial growth in the 1980s. In fact, the conservation of environment was a low priority consideration in regard to industrial development in the past. The concentration of major industrial activities in few centres and the scarcity of pollution control measures before

27. G. D. Crane, "Tropical Cyclones: The Warning System in Australia", *UNDRO News*, Sept.-Oct., 1988.

28. Finance Division, *Bangladesh Economic Survey 1993/94*. (Ministry of Finance, GOB, Dhaka, 1994), Table. 2.3, p. 17.



1985, have also increased industrial pollution.<sup>29</sup> However, perceptions has changed in recent years, and the decision makers are now making some efforts to interface environment and development. But the level of pollution from industries is still very significant and in some cases even alarming, creating several localized environmental problems.

Pollution of water and air is the most prevalent form of industrial pollution, but solid and hazardous wastes are also an increasing concern. Water pollution is a serious but probably a localized problem. Rivers which flow through industrial area such as the Karnaphuli river in Chittagong, and the rivers in the Dhaka and Khulna areas are reported to be among the most polluted. These discharges are highly toxic effluent, including chromium, cadmium and arsenic. In addition to major manufacturing plants, the 24,000 small and cottage industries in Bangladesh are also likely to be a source of pollution.<sup>30</sup> There are fears that the increase in brackish water from shrimp farming is starting to contaminate drinking water supplies, both because the use of brackish water may contribute to increased salinity level. Disposal of waste from boats and ships, and dumping of scrap from ship breaking yards are another source of water pollution, and this is particularly serious in the lower reach of Karnaphuli river and in the sea near Chittagong. Defoliation and death, and top dying of mangrove forest may have been linked with oil spills and oil discharge from ships. These spills and discharge may also pose a threat to shrimp farming.

#### **h) Settlement and Housing**

Human settlement has recently emerged as another priority area of environmental concern. This problem has become an

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29. Md. Reazuddin, "Industry and Pollution Related Issues" in A Atiq Rahman, *et al.*, (eds), Vol. Two, *op. cit.*, pp. 240-63.

30. *Bangladesh Environmental Strategy Review*, *op. cit.*, p. 24.



acute problem for Bangladesh. In Bangladesh 15% settlements are in urban areas while the remaining 85% are in rural areas. However, in recent years, increasing trend of urbanization plays an important role in the development process of country. Contrary, the expansion programmes of urban infrastructure and other utility services can not keep pace with the growth of urban population. Besides, all economic and commercial activities are centred in urban areas. Owing to increasing urban-rural disparity, rural people migrate to the urban centres for subsistence and hope for a better life. As a consequence of industrial activities and over population, urbanization itself has consistently made adverse effects on the environment of developing countries like Bangladesh.

The level of urbanization in Bangladesh remains low compared to many developing countries. Similar to the other sectors, environmental conditions in the urban areas have deteriorated to a considerable extent. The rapid pace of urbanization and unplanned urban growth and expansion create various urban environmental problems, such implications are manifested in the acute land and housing situation, particularly in the proliferation of slums and squatters, waste disposal, in the transport crises, and in the difficulties to render adequate urban utilities services. Rapid urbanization also causes decline in the visual or aesthetic environment of the city, as well as in the social, moral and cultural environment.<sup>31</sup>

Apart from the internal sources that degraded the environment, Bangladesh also faces threats to her environment from the external sources like global climatic changes. The following section touches upon the issues of global climatic changes and its possible ramifications.

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31. Nazrul Islam, "Urbanization and Urban Environment in Bangladesh" in A. Atiq Rahman, *et. al.*, (eds.), Vol. One, *op. cit.*, pp. 341-47.



### III. GLOBAL CLIMATIC CHANGES AND IMPLICATIONS FOR BANGLADESH

UNEP identified Bangladesh as one of the ten countries most vulnerable to rise in the sea level associated with global warming. Although past record shows no significant change in rise in temperature, sea level rise may emerge for low-lying Bangladesh as a complex environmental disaster in the future years. These disasters may occur in three ways: due to increased rainfall or prolonged drought, due to increased frequency of cyclones, because of rise in sea-surface temperature and finally due to rise in sea level.<sup>32</sup>

Global warming and sea level rise as consequences of the climatic changes *with concomitant* greenhouse effects pose a severe threat to the Earth for its existence. Bangladesh with its destructed forest areas, burgeoning population growth and ever increasing trend of impurity of environment is already in hazardous condition. As an external factor, the global climatic changes emanating from two important sources have a number of ramifications for the environment of Bangladesh.

First, greenhouse effects would encroach on the present diverse, complex and dynamic physical environmental setting of Bangladesh with significant differences in climatic condition and annual abnormality. This has been causing floods and droughts recurrently. The socio-economic condition of the people, who are used to live on cultivating land with acute poverty, will fall in such adverse condition. Increasing rainfall due to the global warming would also increase frequency and severity of flood in Bangladesh. Unprecedented socio-economic disorder would arise

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32. M. Q. Mirza and Ainun Nishat, "Development and Environment in Bangladesh: Past Approach, Present Concerns and Future Issues" in Bangladesh Unnayan Parishad (BUP), *Bangladesh: Past Two Decades and The Current Decade*, (BUP and Academic Publishers, Dhaka, 1996), p. 109.



in the future. Climatic condition of Bangladesh from the ancient past has provided to the people simultaneously opportunities and imposed hazards, depending on how the tenants make interaction with the environment. In the future, the extent to which Bangladesh would be affected will depend on the future technological capability, demographic trend and socio-economic conditions and how they influence country's ability to adapt in order to strike a new balance between environment and development.<sup>33</sup>

Second, sea-level rise might have negative impacts on the Bangladesh environment as a whole or either on water, agriculture, forestry, and livestock resources as well as the human behaviour of the inhabitants of the affected areas. With a vast, low-lying and densely populated deltaic coast, the possibility of the sea level rise will have grievous consequences to Bangladesh. While there is general agreement that the sea level should rise, the rate of such rise is very uncertain like global warming. For Bangladesh, changes depend only partially on the changes in the volume of the Ocean. Geological factors, including tectonic and isostatic movements, rates of subsidence or uplift and sedimentation rates and its distribution and deposition play an important role, because they affect the level of the land in relation to the sea. The first two factors can be influenced by climate change on the decadal time-scale, whereas the latter cannot.<sup>34</sup>

Besides, the sensitivity, and vulnerability of the coastal area in regard to future sea level rise is always a key concern to the environment of Bangladesh. However, sea-level rise will not nece-

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33. "The Implications of Climate Change for Bangladesh: A Synthesis", Q. K. Ahmad, *et. al.*, (eds.), *Bangladesh: Greenhouse Effect and Climate Change*, Briefing Documents No. 7, (Bangladesh Unnayan Parishad, Dhaka, 1994), p. 9.

34. R. A. Warrick, *et. al.*, (eds.), "Sea Level-Changes in the Bay of Bengal", Briefing Doc. No. 2, *Ibid.*, pp. vii & 9-13.



ssarily cause a permanent inundation of the present coastal zone. The coastal zones maintained a dynamic balance between forces of erosion and accretion. Land subsidence and sea level rise favour the loss to the sea, whereas supplies of freshwater and sediment to the coast promote the accretion of land. Whether climate changes and sea level rise will down the coast depend critically on how the dynamic balance is maintained in the future. How the coast will respond to the cumulative effects of changes in sea level, waves, storms, river flows and sediments supply in the future is not clear.<sup>35</sup>

From the preceding analysis it may be observed that the ecosystem for the Himalayan in general, and Bangladesh in particular is now in danger of deterioration. In most cases, human interference is responsible for the environmental changes and degradation other than natural process or cycles. The reasons identified earlier for this unprecedented changes may have other causes. Over-population, poverty and environmental debasement are inextricably related and none of these fundamental problems can be successfully addressed in isolation. Before going into the discussion on approaches to face the problem, we turn to reviewing the country's initiatives undergone so far have been depicted by in the following section.

#### IV. FACING ENVIRONMENTAL CHALLENGE: PAST AND PRESENT INITIATIVES OF BANGLADESH

Bangladesh is in transition towards development despite a number of constraints. Whether it is a developed or developing country, environmental issues and sustainable development have become major concerns. These concerns have been emphasized over and over again in Bangladesh at various levels due to the

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35. Q. K. Ahmed, "The Implications of Climate Changes for Bangladesh: A Synthesis" Briefing Doc. No. 7, *ibid.*, pp. 12-14.



recurrent natural and environmental hazards with their devastating impact on the national economy almost every year. Like in other developing countries, environmental degradation in Bangladesh until very recently was regarded as an issue of the developed countries alone. Very recently this attitude has changed considerably and there is recognition of the urgency of environmental problems. Understanding the gravity of the problem, Bangladesh has launched a number of initiatives at the government and non-government levels.

A summary of the various activities and measures so far adopted in Bangladesh to maintain resource conservation and sustainable environment is given here. The initiatives taken up by the government and the non-government organisations have been apparently quite impressive in terms of institutional and legislative framework. Until very recently, the Department of Environment and Pollution Control (DEPC) was the only government agency dealing with the environmental matters. To deal with all the environmental issues the department faces various difficulties including legislative inadequacies and lack of proper directions, and the department has been unable to manage all the issues related to the environment.

Considering the above problems and in view of the importance of environment as a multi-disciplinary subject, and to provide a single oversight ministry covering all the environmental issues, the government in 1989 created the Ministry of Environment and Forest. The Ministry as a member of the Executive Committee of the National Economic Council (ECNEC), an apex decision making body for economic policy issues approving all development programmes, plays an important role in undertaking various initiatives for the protection of environment. The Department of Environment is now running as the technical arm of the ministry and simultaneously responsible



for environmental development.<sup>36</sup> For efficient management of environmental crises, the government has taken a national environment management plan. The objectives of the plan are elaborated below.

### **National Environment Management Action Plan (NEMAP)**

The National Environment Management Action Plan (NEMAP) is now actively working with assistance from UN Development Programme (UNDP). The main objective of NEMAP is to take some concrete actions and to intervene in a number of priority areas of environment. To recommend the institutional strengthening is on the top of the agenda of NEMAP. It has already identified the major environmental problems such as poor land management, deforestation, declining resources like fisheries and untimely flood, and has selected a number of geographical areas where urgent remedial action is needed to address one or more of these problems. A major output of NEMAP is the National Conservation Strategy (NCS). The NCS has outlined detailed measures for conservation of natural and biological resources with the assistance of the International Union for the Conservation of Nature and Natural Resources (IUCN) in 1991.<sup>37</sup>

Another important initiative in the natural resource management is the New Fisheries Policy (NFP) of the government where critical issues centred on the survival of a large number of fresh water fish species and the sustainability of these fisheries resources. With regard to flood, the government with collaboration of a consortium of donors prepares paramount task, namely Flood Action Plan (FAP) with 26 components to combat and mitigate

36. *Bangladesh Environmental Strategy Review, op.cit.*, p. 2.

37. Saleemul Haq and A. Moyeen Khan, "Environmental Activities in Bangladesh" in A. Atiq Rahman, *et. al.*, (eds.), Vol. One, *op. cit.*, p.84.



the catastrophe in Bangladesh. The programmes are widely criticized, and raised multi-dimensional difficulties from different environmental viewpoints. In addition to the Ministry and Department of Environment, a number of other government agencies (Department of Forest, Directorate of Fisheries, Water Development Board etc.) work on different environmental issues. Besides, a good number of non-government organizations are now involved in the research and development of the environment. Bangladesh Centre for Advanced Studies (BCAS), International Union for Conservation of Nature (IUCN), Proshika, Bangladesh Rural Advancement Committee (BRAC), Grameen Bank, Association of Development Agencies of Bangladesh (ADAB) and Christian Community for Development in Bangladesh (CCDB) are the leading NGOs working in the environmental area with active participation of the people. From the above description, it is quite apparent that environment has become an important and integral part of sustainable development activities in Bangladesh.<sup>38</sup>

But the reality is that the environmental protection measures are not adequate to maintain the necessities. The Environmental Pollution Control Ordinance of 1977 was not adequate in every respect and was not easily accessible to ensure the sustainable development.<sup>39</sup> Recently, the Jatiya Sangsad (Bangladesh Parliament) replacing the Ordinance 1977, adopted a new bill, namely, The Environmental Conservation Bill, 1994 to empower the related agencies to enforce powers given to them. At the same time, the new law broadens the scope of the department's mandate to include that of formulating guidelines in matters of environment and natural resources. But the new law is unable to give direction for natural resources management such as forestry,

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38. For details see, *ibid.*, pp. 82-95.

39. See, Environment Pollution Control Ordinance 1977, GOB.



water crises management, coastal ecosystem. In addition, definition of environment makes the whole thing unclear and narrow.<sup>40</sup>

## V. PROTECTING ENVIRONMENT AND ACHIEVING SUSTAINABLE DEVELOPMENT: A SUGGESTED APPROACH

Given the limitations of the institutional and policy measures so far adopted, Bangladesh has embarked upon a new approach to protect its environment and achieve sustainable development. As mentioned earlier, environmental crises are the consequences of inauspicious effects of interaction between man and environment. The new meaning of integrated sustainable development and environmental management implies a much more interactive and dynamic process.<sup>41</sup> The great difficulty inherent in changing from the old style of management to the new approach called for integrated development of resources and management. It deals with the wide scope of resources development that can be very complex even with full range of delegation options such as decentralisation, privatisation and community based environmental management and sustainable development.<sup>42</sup> Policy reforms and institutional changes are required to bring about accelerated development and better environmental management. The obstacles are paramount. Nevertheless, the present time is unprecedented in its potential for changes. The growing recognition of the importance of environmental concerns, the rapid introduction of economic reform programmes around the world, and the trend towards democratization and participation in the development process would have to be pointed in the right

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40. Bangladesh Environmental Lawyers Association (BELA), *Bangladesh Environmental News Letter*, Vol. 5, No. 4, 1994, Dhaka.

41. UNDP/IBRD, Background Paper of "International Conference on Water and Environment", Ireland, 1992, p. 4

42. *Ibid.*



direction. The United Nations Conference on Environment and Development (UNCED) commonly known as the "Earth Summit" in Rio in June 1992 has provided an opportunity for various nations of the world to commit themselves to an agenda of environmental reform.

For a disaster-prone country like Bangladesh, economic development can not be achieved at the expense of the environmental protection; it must put stress on the need for sustainable growth. Controlling pollution, improvement of environmental quality and reversing the declining trend in natural resources must get prime considerations in the strategy of environmental conservation for sound and healthy life of the present and future generations. To achieve sustainable development, the most important tasks are to control or mitigate the loss of water and soil degradation, increasing the forest coverage and national reserves, increasing land productivity, and the introduction of ecologically friendly agriculture.

Environmental problems in agriculture sector demands urgent attention because of its economic importance. In Bangladesh, agriculture accounts for 34% of the total GDP and employs about 60% of the population despite high rate of decline and degradation in terms of fertility and size in recent years. The ways to overcome the issues related to the land lie in strengthening land management and land use planning, protection of agricultural land from industrial and residential use, improving inputs, and minimizing adverse impacts of the fertilizer and pesticides and introduction of pollution control equipment in the industry and perhaps in preserving agricultural land in sustainable condition. In addition, family planning for reducing the population pressure and education are the key elements for sustainable development.<sup>43</sup>

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43. World Bank. *Bangladesh Environmental Strategy Review*, *op. cit.*, pp. 39-49.



To achieve sustainable development, reforestation and tree plantation are of absolute necessity to raise tree cover for 25% of the total land. The social afforestation programme of tree plantation on homesteads, fallow land, roadside embankments, riverside etc. may become an effective way in afforestation programme. Motivation activities may play an important role to communicate on this problem. Participation of the poor people to solve the problem is also necessary. Although it is only one side of the issue, it may contribute a lot to improve the environment.

Environment is a global issue of multifarious dimensions with its scope and effects going far beyond a specific perspective. It does not always remain in the frontier of a single country. In most of the cases, it takes a transboundary dimension.<sup>44</sup> In this context, to minimize further deterioration of the environment, a regional as well as a global action plan is immediately necessary with the consensus of all the countries of the region of the world. This action plan must follow step by step development processes with proportional financial involvement according to their per capita income. In addition, the industrially developed countries have to play a vital role in fighting the adverse effects of it, because they polluted the environment most and are perpetuating the situation.<sup>45</sup> On the processes of global environmental hazards, Bangladesh can make little contribution, although it suffers the worst consequences. Realizing the global imbalance which leads to environmental hazards, the countries of both the northern and southern hemispheres may make some contribution to overcome these.

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44. *The Daily Star*, 10 August 1993.

45. *The Bangladesh Observer*, 28 December 1993.