Sustainable Development and the Environment in Bangladesh

by Fahmida Akter

THE World Commission on Environment and Development (1987) has defined sustainable development as development that meets the present generation without compromising the ability of future generations to meet their own needs. In other words, for a development to be sustainable the standard of living for the current generation has to be raised without imposing any significant cost on future generations. One important way of creating this cost is by deteriorating the environment and also through the loss of natural resources. Hence special attention should be paid to the quantity and quality of environmental assets. If we consume all natural resources today to obtain economic growth, we will not only degrade the environment but create huge cost burden on the future generation which can never be compensated. Therefore, sustainable development requires not only non-declining manmade capital but also non-declining natural capital. So optimal use of natural resources and the environment are essential for a long lasting economic development.

In Bangladesh high population growth and rampant poverty have contributed to the unsustainable use of its limited natural resources. About 80 per cent of the population rely on the primary sector for their economic activity and thus put tremendous pressure on the natural resources. The poor use land, water, forest and other resources intensively as means to survive. This results in depletion and degradation of the resources manifest through deforestation, destruction of wetland and fisheries, air and water pollution, soil erosion and inland salinity intrusion. With population pressure the demand for these resources increases. This leads to further degradation of the environment and the destruction of the resource base. If the present trend of resource-use continues Bangladesh will virtually have nothing left for its future generation.

The gloomy picture of the economy and environment in Bangladesh makes the question of sustainable development a critical one. The economy might have shown a little progress in terms of GDP growth over the past years (at an average growth rate of 4 per cent approximately) but many other aspects of life remained neglected. Education, health, environment and some other quality of life such as equality, social justice, social security are also a part economic development in a broader sense. These issues have to be taken care of if Bangladesh wants to follow the path of sustainable development and ensure welfare for the future generation. Because sustainable development requires meeting the basic needs of all extending the opportunity to all to fulfil their aspirations for a better life.

The State of the Environment

The important areas of environmental concern in Bangladesh include declining soil fertility, river bank erosion, siltation of rivers, water pollution, air pollution, degradation of natural forests and wetland, degradation of coastal environment, loss of fisheries. The causes of environmental degradation can be identified as industrial pollution, excessive use of chemical fertiliser, commercial exploitation of natural resources, deforestation, flood and natural hazards, population pressure on land and other resources and poverty.

Some of the factors such as poverty can both be a cause and effect of environmental degradation. Poverty leads to exploitation of resources which ultimately causes degradation of resources. The poor are also the most vulnerable to any environmental degradation. Any degradation leads to worsening the poverty situation. Ignorance, lack of appropriate policies and institutional failure are no less important causes of degradation.

Deforestation

There has been a continuous depletion of forest resource over the past few decades. Estimates of deforestation in Bangladesh vary among various sources due to unavailability of actual information on tree cover density in the forests. Some periodic visual observations show that deforestation affects one eighth of the land area of the country. Data from official statistics show that annual deforestation rate is around 1.4 per cent. In the Sal Forests near Tangail forests cover was reduced from 1000 hectares in 1970 to about 500 hectares in 1990. In less than 35 years the volume of commercial species in the Sundari and Gawa has declined by 40 and 45 per cent respectively.

Over-cutting, land clearing, mainly for shifting cultivation, encroachment, overgrazing, uncontrolled commercial logging, illegal felling, fuel wood consumption, and natural disasters like cyclone and flood are the direct causes of deforestation in Bangladesh. Shifting cultivation is characterised by a rotation of fields rather than of crops, often accompanied by slashing and burning. An area of about 85,000 hectare is under shifting cultivation in the Hill Forest reserves (excluding Chittagong Hill Tracts) with the engagement of 60,000 families. Eneroachment problem exists both in the Hill Forest and Sal Forest. Around 12,200 families have encroached on 77,000 hectares of forest. The extent of land transfer is about 61,000 hectares upto 1984.

Land transfer takes place for various purposes such as settlements, industrial development, fishery, irrigation, energy and power, mining, communication, tourism etc. Indirect causes of deforestation include population pressure, poverty, landlessness and lack of appropriate forest management policies and regulations. Illegal felling and encroachment reflect the failure of government regulation. Government policies and regulations also contribute to deforestation and declining productivity. Underpricing and inefficient use of wood products sold to government owned industries is a major factor in the mismanagement of forest resources.

Land Degradation and Soil Erosion

Land is an important natural resource in Bangladesh, specially in the rural areas. It is used mostly for crop production. Net cultivated area is about 60 per cent of the total land area. However, the amount of land per person is very low. There is less than 0.1 hectare of arable land per person. Almost all the lands are used for agriculture, forestry and settlements. For industry, infrastructures and social need less than 1 per cent of the total land is being used.

Bangladesh has about 500 soil series which contain various kinds of landform and hydro-morphic and drainage conditions. From the agricultural production point of view, soil types are broadly categorised into three types: floodplain soils, terrace soils and hill soils. About 80 per cent of the land is in the floodplain. Flood plain comprises 2.85 million hectares of coastal and off-shore islands where the cropping intensity is much lower than the average. Hill soils cover about 12 per cent of the land. High hills have very steep slopes and are susceptible to erosion and land slides during monsoon. Low hills usually have short steep and mostly under plantation crops.

An area of about 1.74 million hectares of sloppy land is now having serious erosion threat because of shifting cultivation and lack of appropriate management practices. Increase in cropping intensity and cultivation of modern crops have resulted in the removal of nutrients because of uneven replenishment. The problem of nutrient deficiency is increasing. About 4.5 million hectares and 1.75 million hectares of land have been identified to be deficient of sulphur and and zinc. Soil erosion is a serious problem in Bangladesh specially in the hill areas like Chittagong Hill Tract and Modhupur Tract. An area of about 808.17 square kilometre in Moulvibazar and Sylhet districts faces the problem of soil erosion.

Influx of settlers, clearing of forests, low organic matter, poor soil structure, heavy rainfall and inappropriate land management, the removal of fertile top soil and replacement of infertile soil to the surface are causing this erosion. Energy crisis in rural areas leads to land degradation. Burning trees reduces the amount of organic matter in the soil and tree cover. Use of cow dung as fuel reduces its use as manure. Use of pesticides to a greater extent also causes problem for the soil. Research has shown that pesticides applied at the rate of one pound per acre contaminate the topsoil to a depth of a foot (Rahman, 1994). Waterlogging due to the embankments built to control flood can induce iron toxicity in soil. Embankments can also cause siltation of rivers and land within poldered areas. The problem of siltation is acute in the district of Khulna.

Water and Air Pollution

Water is being polluted in many ways. Tannery, paper, pulp and jute mills in major industrial cities discharge their pollution untreated into the water. Raw sewage, organic wastes are discharged directly into the water. Numerous boats, launches, steamers release diesel and oil wastes that pollute the water. Oil tankers and cargo ships come to sea ports of Bangladesh which spills oil and discharge wastes.

According to a report there are 144 industries in Chittagong zone which produce DDT, pesticides, tanneries, textiles, paper, rayon, soap and detergents, chemical etc. (ESCAP, 1988). These industries discharge effluent into the Karnafuli river and estuaries water of Bay of Bengal. This causes severe pollution to the river and estuary. Aquatic fauna and flora and aquatic system are also being endangered. Water pollution is occurring also in industrial zones of Khulna, industrial areas of Tongi, Ghorasal, Demra, Fenchuganj and Chhatak.

High level of pesticides leached to the water causes regular outbreaks of epidemic diseases in fish and thus reduces fish production. Upto 40 per cent of the fertilizers used are leached to the low-lying areas where weeds proliferate and an unknown amount of pesticides end up in the irrigation and drainage system. It also encourages a proliferation of weeds and algae growth which depletes oxygen content of the water. Growth in urban centres and industries has increased the level of air pollution as well. Vehicular and industrial pollutions are causing serious health problems.

Towards Sustainable Development

Poverty of Bangladesh is reflected not only in its low per capita income but also in other indicators of the standards of life such as life expectancy, daily calorie intake, consumption of resources and the environment. Success in poverty alleviation and achieving economic development are being undermined by insufficient attention to sustainable use and management of natural resources and to the economic cost of environmental resources. The economy of Bangladesh is very much dependent on the productivity and quality of soil, water, forests, fisheries and other natural resources. However, environmental aspects have not received enough attention in Bangladesh. Until 1989 there was no separate ministry for environment. Recurrent natural disasters and concern about environmental degradation led the government of Bangladesh to declare 1990 as the Year of Environment and nineties as the Decade of Environment. Initiative has been taken to have a National Environmental Management Action Plan (NEMAP). However, necessary action to prevent further degradation of the resources is yet to be taken and implemented.

• As far as specific environmental policies are concerned programmes should be taken focusing on the preservation of wetland, afforestation and reforestation. Actions are needed to keep the extent of effluent dumping, air, water and solid waste pollution within an acceptable limit. Development policies should be undertaken after in-depth assessment of the impact on the environment.

• The solution to many environmental problems lies in the reduction of poverty. In rural areas the poor exploit natural resources to survive. When the opportunities become limited they migrate to the cities in the hope of greater opportunities. Population pressure in the urban areas due to migration from rural areas cause land scarcity, pollution and social problems.

• Population growth is the most serious problem facing sustainable use of natural resources. If uncontrolled it will worsen poverty situation and environmental degradation. Health and family planning programmes should be expanded and operated efficiently to cover a greater number of population under these facilities.

• Due to the absence or inaccessibility of scientific and ecological information many severe environmental problems crop up in Bangladesh. Therefore, increased awareness both at the individual and national level is essential to develop a sense of responsibility towards keeping the environment sound. In a country like Bangladesh this will call for educating the people first of all.

• Any programme whether environmental, economic or social development cannot succeed due to institutional failure. Environmental laws regarding forestry, air and water pollution, pesticide use, solid waste, industrial effluent, land use have to be updated. The implementation of regulations requires regular monitoring. In order to monitor these programme a strong institutional set up is essential.

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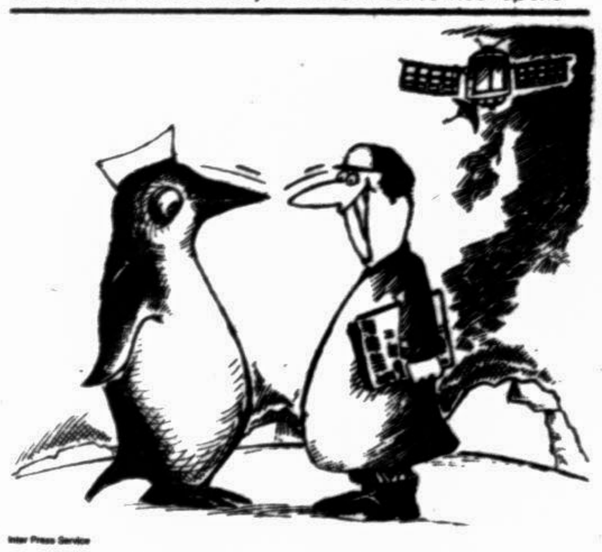
If we consume all natural resources today to obtain economic growth, we will not only degrade the environment but create huge cost burden on the future generation which can never be compensated. Therefore, sustainable development requires not only non-declining man-made capital but also non-declining natural capital. So optimal use of natural resources and the environment are essential for a long lasting economic development.

Indians in Antarctica

*India begins a satellite-tracked **wildlife census** in Antarctica. **Mahesh Uniyal** of Inter Press Service reports.*



Inter Press Service

TRACKING a petrel is not a routine bird spotting chore in the frozen wastes of Antarctica, where blinding blizzards and the absence of landmarks can confound the most determined wildlife watcher.

But for two months early this year, ornithologist from one of the world's premier wildlife institutes in this north Indian town will use satellite tracking, hi-tech maps and a zest for the unknown to count birds and mammals in the icy desert.

S Sathyakumar, a wildlife biologist at the Dehradun-based Wildlife Institute of India (WFL), is part of India's 60-member scientific expedition to Antarctica that sailed to the world's southernmost continent on Dec. 15, 1994 on a hired icebreaking ship, 'Icebird'.

Antarctic expeditions are not what comes to mind first when one hears of India, but this is India's 14th annual scientific trip to the southern continent. It will take at least three weeks to reach the Indian base camp named Dakshin Gangtri at 70.05 degrees south latitude and 12.00 degrees east longitude.

A team of Indian scientists lives in at the base year-round. But for the first time, a wildlife expert is part of the expedition which will start a long-term study of Antarctic birds and mammals in the areas around the Indian base stations.

Sathyakumar, who will be followed by other wildlife biologists who will keep tabs on the animal numbers over the next quarter century, is also expected to start tinkering with new gadgets to run a census on animal populations there.

Magnetic compasses do not work so close to the South Pole, but finding his way around the ice sheet will be easy. All Sathyakumar has to do is to press a key on a handheld satellite positioning device to find the longitude and latitude of the spot where he is standing.

The Global Positioning System locks on to overhead orbiting satellites to calculate the user's position and will enable Sathyakumar to chart his travels across the barren landscape with almost pinpoint accuracy.

He will also use Antarctic maps supplied by India's national remote sensing agency and the US-based National Aeronautics and Space Administration (NASA). Helicopters will be used for aerial survey of penguin rookeries.

Set up in 1982, the Dehradun Institute is recognised by the International Union for Conservation of Nature (IUCN) as a centre of excellence for wildlife study and has trained experts from South Asia and several nations.

The institute is pioneering a continuous Antarctic wildlife census. At least 18 of the more than 40 estimated Antarctic bird species are found in the areas around the Indian base camps which also have two kinds of seals and three to four whale and dolphin species.

The IUCN has identified five mammal species in Antarctica: crab eater seals, leopards seals, blue whales and hump backed whales. The major bird types include, the emperor penguin, adelie penguins, albatrosses, petrels, skuas, fulmars and gulls.

But very little is known about the bird and mammal population in the Dakshin Gantri and Maitri regions, where India maintains scientific stations. The country is one of several carrying out scientific studies on the continent.

The Antarctic plays a vital role in the global ecology and experts say its conservation is crucial for preserving the planetary balance of nature.

"The greatest value of Antarctica is as a vast natural laboratory where research, which may be of value elsewhere for interpreting and managing the human environment, can be peacefully and cooperatively pursued," says an IUCN document.

The challenge facing the global community is to establish a conservation regime for the Antarctic region which will ensure that all human activities there and any uses of natural resources can be accomplished without unacceptable damage to the natural environment," it adds.

According to the IUCN, the Antarctic's still pristine environment is threatened by tourists who first started visiting in the late 1950s and now come in thousands every year.

The increased human presence and traffic have polluted the Antarctican waters. Toxic chemicals like DDT were detected in the tissues of Antarctic organisms as early as the 1960s.

Climate Change and Sealevel Rise: The Bangladesh Context

IN response to the growing concerns about the threat of climate change, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) jointly established the International Panel on Climate Change (IPCC) in 1988. The IPCC drew together many hundreds of world's leading scientists and policy-makers from both developed and developing countries to examine possible impacts of future climate change and sealevel rise.

IPCC published its first Assessment Report in 1990. The report stated that unless something is done to limit greenhouse gas emissions, the planet will undergo global warming and consequently the sealevel will rise. Following the recommendations of the report, a Coastal Zone Management (CZM) sub-group was formed and an operational methodology to assess the vulnerability of coastal island nations to sealevel rise was developed. The methodology remains sufficiently flexible to allow individual national needs and circumstances to be addressed. The vulnerability assessments (VAs) was conducted on some coastal nations like Argentina, Australia, Bangladesh, France, Gambia, Japan, Kiribati and the Netherlands. The VA studies were coordinated by the IPCC-CZM sub-group. The Bangladesh case study was initiated in 1991 and the first result was published in Venezuela at the United Nations Conference on Environment and Development (UNCED). The conclusion and recommendations of the pilot study were presented in the World Coast Conference (WCC) held in Noordwijk, the Netherlands in November 1993 while the summary report of the VA case study has been presented at workshop in Dhaka organized by BCAS on 21 January 1995.

Bangladesh with its low-lying deltaic landmass, has high population and low level of socio-economic development. It has to cope with natural hazards like cyclone, flood and drought almost routinely.

The study on Bangladesh analyses climate change issues in the context of integrated coastal zone management, considering other longterm impacts. In particular, the study addresses the following questions:

• What are the likely primary physical effects of climate change and sealevel rise on the coastal areas of Bangladesh?

• What will be likely consequences of these primary physical effects on the population, the physical infrastructure, agriculture and natural ecosystem?

• What institutional arrangements and capabilities exist within Bangladesh to deal with and respond to the challenges of climate change and sea level rise?

• What are the interactions and sensitivities in different development options within and outside Bangladesh to the possible threats of climate change and sealevel rise? and

• What needs to be done in the future in order to reduce the vulnerability of Bangladesh to effects of climate change and sealevel rise?

Climate change

The Earth's climate is changing at an unprecedented rate, due to warming of the atmosphere by the so-called green-house effect, whereby heat is trapped at the surface of the Earth. Under normal conditions, energy from the sun passes through the atmosphere, some of which warms the Earth's surface and the rest is then reflected back into the space. Since certain amount of greenhouse gases has been accumulated in the atmosphere which acts like the glass in a greenhouse trapping the radiation and this causes the surface of the Earth to heat up.

Until the early 1960s, the greenhouse effect of CO_2 was the major source of anthropogenic impact on climate, but this picture has been changed dramatically in the recent years. In the past 30 years, the concentration of synthetic trace substances such as chlorofluorocarbons (CFCs) have increased rapidly. These substances are significantly more effective in enhancing the greenhouse effect and at present, the rate of increase of the total heating of the planet is now about five times greater than the previous decades. The IPCC has forecast that global warming will indeed occur, and has assessed four possible scenarios:

Scenario A: "Business as Usual" i.e. a continuation of current trends in greenhouse gas emissions, which will produce a rate of warming in terms of global mean surface temperatures of 0.20 C-0.50C per decade in the 21st century, with a "best guess" of 0.30C. This would produce a 1 degree rise in temperature by the year 2025 and 3 degrees by 2100, compared to 1990 levels.

Scenario B: Deforestation is halted, natural gas is increasingly substituted for coal, energy conservation occurs, but temperature still rises by 20C by 2100 compared to today, i.e. a rise of 0.20C per decade.

Scenario C: A greater switch to renewable energy sources in the second half of the 21st century holds the temperature rise to a little above 0.10C per decade and;

Scenario D: Assumes that the switch to renewable occurs in the first half of the 21st century, which stabilizes gas concentrations in the atmosphere.

Sealevel rise

One of the most important consequences of an increase in mean global temperature will be a possible rise in the sealevel around the planet. This will be due to expansion of ocean's volume when water temperature increases followed by mountain glacier meltwater from the land. In addition to the rise in sealevel due to increased temperature, the land surface of the planet will undergo some changes due to a number of factors including tectonic changes, sedimentation etc. The actual level of sealevel rise at any given point along a coast will depend on the movement of the land surface. In the case of Bangladesh, it is viewed that the coastal areas along with some other low-lying parts of it, which would be approximately 14 per cent of the total landmass may in fact be subsiding.

The IPCC has estimated that by the year 2100, mean sealevel rise will be between 30 to 100 cm as a result of global warming which corresponds to maximum rates of 3.5-15 mm per year. In such a "business as usual" scenario of climate change and sealevel rise. Bangladesh will face the following physical effects: inundation, lowflow condition, saltwater intrusion, flash flood, draught, storm surges and river and coastal erosion. These will have certain negative impacts on natural ecosystem, human habitation, agriculture, infrastructure, economy and on the social system. The probable socio-economic and physical impacts will be addressed in the next issue

This article has been prepared based on the study conducted by a multi disciplinary team of Bangladeshi and Dutch experts organized by Bangladesh Centre for Advanced Studies and Resource Analysis from the Netherlands

This is the first instalment of a three part series. The remaining two parts will be published gradually.

BCAS Feature

Galdikas Fights for Paradise

Lenah Susianty writes from Jakarta

Researcher Birute Galdikas loves her orang-utans so much that she has adopted Indonesian citizenship to continue working with them — "they live here, so I want to live here too." Gemini News Service reports on another controversial "ape woman".

Galdikas and orang-utan : Struggle for survival

THEY are nearly human, sharing 98 per cent of our genetic material. Their name literally means "man of the forest." But the orang-utans of Indonesia are little-understood and often ignored by their human neighbours.

For 23 years a population of the endangered primates has been sharing the forest with a human companion — Birute Galdikas — the third of an extraordinary trio of women who have devoted their lives to the study of apes.

The two others are Dian Fossey, who lived with gorillas, was murdered in Kenya and whose life was made into a Hollywood film, Gorillas in the Mist, and Jane Goodall, who studied chimpanzees. Both they and orang-utan specialist Galdikas were students of Kenya's Louis Leakey, the renowned archaeologist and anthropologist who studied the origins of humanity.

Galdikas is so devoted to her primates that she has given up her Canadian passport and taken Indonesian citizenship.

"Orang-utans live here, so I want to live here too," she says. "Besides, after 23 years living here, Indonesian culture has now become my culture." She has married Bohap bin Jalan, a rice farmer, and they have two children, Jane, 9, and Frederick, 11. She also has a son, Bindi, who lives in Canada with her first husband.

Life in Indonesia, has not been all plain sailing. In 1992 her research permit was cancelled because of disagreements with the then Forestry Minister, Hasjrul Harahap, and government officials.

Harahap said her methods had hampered the government's efforts to get captive orang-utans back into the wild.

Galdikas says that only a few of the 150 ex-captive orang-utans she has released ever go near tourists in the park's Camp Leakey.

A truce was called in the dispute last year when the new Minister, Djamaloedin Soeryohadikoesoemo, granted her a temporary research permit.

The aim of her book "is not only to tell the world my sweet and sour experiences in one of the wildest tropical forests... this is about my spiritual experiences which I apprehended thanks to the orang-utans," says Galdikas.

She describes her experiences as "reminiscences of Eden. Human beings were expelled from Eden [according to the Bible] but the orang-utans were not. They still live in paradise. I feel paradise by living with them."

Orang-utans are generally mild-mannered — "normally, they are more like animals of Disneyworld," says Galdikas — and attack only if disturbed by humans.

Their biggest threat is deforestation.

"It is important to understand that they need forests, not trees. I know it is unrealistic to totally forbid the logging because one of the Indonesian economy's biggest contributors is wood. But practising environmentally-friendly techniques is also necessary now.

But logging earned Indonesia $3.8 billion in the first eight months of 1994. Although the current Forestry Minister has been supportive and local people are helpful, Galdikas says, "the logging concessionaires have yet to understand the importance of saving forests."

Part of her problems with the Indonesian authorities, believes Hidayat Habani of the environmental organisation Skephi, are based on cultural differences: "Western scientists are not reluctant to publish the result of their research, for example, but here it is not yet common, especially if it is on sensitive issues."

Habani stresses that foreign researchers are still needed: "It is rarely that Indonesian scientists are willing to do a particular research for years, as Galdikas does. And they (foreign scholars) have the knowledge which they can share with us. Galdikas herself has assisted many Indonesian students and was very helpful. She has even recommended some of her Indonesian assistants to obtain scholarships to study abroad. And because here the budget for research is still limited, their presence can also benefit us."

Galdikas is a winner of the United Nations Environment Programme's "Global 500" environmental award, the Sierra Club's Chico Mendes Award and the Chevron Conservation Award.

Her work is supported by two US-based non-government organisations, Orangutan Foundation International, which provides money, and Earthwatch, which sends volunteers to assist her.

Nevertheless, Galdikas, a professor at Canada's Simon Fraser University, still has a long way to go to persuade the public of the importance of preserving orang-utans.

— Gemini News