The development-environment conflict: Lessons learnt

Following the National Environment Policy 1992, the Bangladesh Environment Conservation Act, 1995 and the Environment Conservation Rules, 1997 were promulgated aiming at systematic industrialisation to ensure sustainable development keeping the environmental cost minimal. But continuing environmental degradation indicates a missing link between environmental pollution control efforts and the laws and regulations.

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THE conflict between development and environment still remains unresolved. Industrial revolution in the 1780s, Green revolution in the 1960s gave great prosperity to humankind but snatched away many things of importance and in some cases caused irreversible damages. England first had the industrial revolution and Edwin Chadwick in 1842, 70 years after the industrial revolution submitted the world's first famous report on water pollution to the British Parliament. Following the start of Green revolution, *Silent Spring* published by Ms. Rachel Carson indicated the toxicity of insecticides such as DDT in 1962.

The industrial revolution and its deep connection with strongly infectious diseases such as Cholera and Dysentery gave birth to "Public Health Act (1848)" in England. In 1911, H A Volux submitted the first report in the world on the disaster of air pollution titled "The Disaster Caused by Dust and Fog in Glasgow, Scotland (estimated death toll: 1063)". Los Angeles Smog (1951), London Smog (1952) caused death of 400 and 4000 persons respectively. Minamata disease due to water pollution by organic mercury (Hg) in Kumamoto around 1959, Yokkaichi asthma (due to air pollution) around 1972, water pollution in Dokai Bay (Sea of Death) in the 1960s and loss of fisheries are some noted events in Japan. Still there are victims of Hg pollution.

Environmental problems of today are of complex character as industrialization has been diversified in quality and by regions. Environmental pollution depends on various factors like type of industry, raw materials, production technologies, location of industries, etc. For a particular type of industry, change in energy source e.g. shifting from coal to petrol/diesel, and raw materials as well, caused significant change in types of diseases as well as magnitude of damages.

Even before becoming industrial powers, the industrialised nations caused a variety of environmental problems. They are still confronting with serious environmental issues of water, food and air pollution. Some of them have been solved by the application of engineering techniques or by imposing legal constraints, while others still remain untouched or unresolved. They are now thinking of striking a balance between industrial development and environmental problems.

Despite the fact of environmental problems, still many countries are promoting industrialization to secure employment for the population and other developmental factors characteristic of the country. Bangladesh is no exception to this. Bangladesh faces serious problems of overpopulation, extreme poverty, illiteracy and environmental pollution. Over the decades, she has undergone processes of environmental degradation with natural resources depletion at a faster rate. All those factors combine to multiply the scale of socio-economic setbacks, imposed by recurring natural disasters, often of exceptional magnitude.

Environmental problems

Till 1962 the number of industries in Dhaka was about 100, most of them of small to medium scale and located mostly in present old Dhaka area. Establishment of so many industries started mostly after independence. The important industries in the country are textile & dyeing, leather, paper and pulp, fertilizer, sugar, steel, oil refining, chemical and pharmaceuticals and other small scale agro-based and agro-allied industries and of course the readymade garments.

Bangladesh is basically an agrarian country. The government of Bangladesh promotes rapid industrial development to increase export earnings and employment opportunity for the growing population and to relieve pressure on the available agricultural lands. But present performance of the industrial sector is disappointing with enormous environmental problems due to inferior technology, lack of treatment facilities of industrial waste, etc. The growth of industries has generally been unplanned without keeping the issue of environmental protection in careful consideration.

In 1986, DoE identified 903 industries as most polluting that swelled to 1176 in 1997. Currently the list of polluting industries is expected to be much longer. Many industries are located on the banks of natural streams or rivers while many others in the residential areas causing air and water pollution through smoke emission and dumping of untreated effluent. Monitoring results by the Department of Environment (DoE) and other research organizations indicated alarming level of the localised air and water pollution by those industries. The condition of Buriganga, Balu, Turag, Shitalakshya, Karnafuli, Bhairab rivers is a glaring example of deteriorating environment.

Additionally, though not well documented, the use of agrochemicals has significant contribution to water pollution. Commercial marketing of pesticides in Bangladesh began in 1956 with 03 tons that increased to 37,712.20MT in 2007. From 1960 onward, green revolution accompanied by HYV crops, high dose of chemical fertilizers and pesticides subsequently brought stagnation in yield of crops. Improper and increased use of agrochemicals, disposal of industrial waste into water bodies contributed to fisheries habitat degradation. During the last decade the country has lost at least 24 species of inland fishes. The residual effects of agrochemicals hit the aquatic organisms and ultimately affect human health through food chain.

Urban challenges

Although the majority (~77%) is rural population, the urban population is growing at about three times the rate of average national growth rate. Dhaka is now the eighth largest city in the world, and with current trend in urban growth rate continuing for the next 10-15 years, it will become the second largest city in the world, growing to about 580 km2 and 23 million people. With current infrastructures Dhaka is perhaps capable of effectively handling only 5-10 million people.

Rapid and unplanned urbanization, commercial development along with very high population pressure have made Dhaka an environmentally polluted city in the world. The number of tanneries has increased to over 200 from 26 in 1975 (Rizvi 1975). Nearly 2000 garments industries have been established all over the city since the early 1980s. Rapid and unplanned establishment of industries in different places of the city is responsible for localized pollution effects. The rivers Buriganga, Balu, Turag and Shitalakshya together receive huge amount of untreated sewage and industrial liquid waste as well as municipal waste. As a result, water of those surrounding rivers and lakes has already exceeded the national standard limit in pollution.

A strategic cost/benefit analysis indicates that, with continuing increase in the urban population and ongoing deterioration of the environment of Dhaka city consequent, losses would mount from year to year. Without any action, the total estimated minimum financial loss (cost to the economy of Dhaka and Bangladesh as a whole) would be US$ 51.1 billion over the next 20 years. Contrarily, if appropriate measures are taken to clean up Dhaka, estimated net economic benefit would be more than US$ 50.0 billion. Results of environmental protection will be realized through increased agricultural and industrial productivity, improved human health, increased biodiversity, etc.

Industrial waste indiscriminately dumped in water body to the peril of the localities around.

Policy initiatives vs reality

The concern about environmental issues, however, has been reflected in different policy initiatives taken by the government of Bangladesh. The major policy initiatives, strategies and plans emphasized environment and natural resources management to achieve sustainable development. The National Environment Policy 1992, National Forest Policy 1994, National Water Policy 1999, National Agriculture Policy 1999, National Land Use Policy, 2001 all aimed to ensure development in harmony with the natural environment. The Wetland Policy (Draft) puts special emphasis on the conservation of wetlands.

National Environment Management Action Plan (NEMAP) 1995 is the major policy document that recognized links between environmental degradation, poverty, and population growth. National Biodiversity Strategy and Action Plan 2004 put due priority on the recovery and conservation of degraded ecosystems. Following the National Environment Policy 1992, the Bangladesh Environment Conservation Act, 1995 and the Environment Conservation Rules, 1997 were promulgated aiming at systematic industrialisation to ensure sustainable development keeping the environmental cost minimal. But continuing environmental degradation indicates a missing link between environmental pollution control efforts and the laws and regulations.

Concluding remarks

Environmental problems followed by industrialization are a historical truth. The history of industrialization and environmental problems gave a very important lesson to humankind that industrialization must not be at the cost of environment. Bangladesh is yet to be an industrialized country and whatever industrialization happened is largely unplanned and unconsolidated. Industrial waste already pose a serious threat to the environment.

Hopefully the history would help in rethinking and give impetus to develop an integrated functional environmental management plan including pollution load reduction, research and development of pollution control technologies, human resources development, establishment of industrial zones and harmonization of sectoral policies and rules. Provision for necessary budget allocation should be kept for effective implementation of the plan. All concerned must act in a responsible manner because environmental damages are often slow but irreversible.

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VCF in CHT: A sustainable model of forest management

The issue of deforestation and environmental degradation in CHT has received increased attention in recent years. However, it is very difficult to conserve the forests without considering the livelihood options of the dependant communities. In this regard, VCF would be an influential model for maintaining a balance between conservation and exploitation.

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CLIMATE change signifies the deforestation issue as a major development challenge. FAO estimates that 13 million hectares of the world's forests are disappearing annually, and that accounts for 20 per cent of all global greenhouse gas emissions. If deforestation continues at the present rate then the tropical forests may be lost by 2050. This is likely to be true, but so far no international treaty has provided any financial incentive for reduction of deforestation and degradation of the ecosystem in the tropics, except the Kyoto Protocol's Clean Development Mechanism (CDM), which allows investment from developed countries to compensate for their greenhouse gas emissions through forestry schemes for developing countries.

However, where poverty is a big issue and people depend on forest for subsistence livelihood, deforestation considered as a component of development. Considering the overwhelming dependency on forest recently REDD (Reducing Emissions from Deforestation and Forest Degradation) has been proposed where incentive will be provided to conserve existing forest. Undoubtedly, it is an opportunity for forest poor countries like Bangladesh; where many indigenous and local people directly rely on surrounding forests for their livelihood. The million dollar question, albeit, is how to manage the existing forest in a sustainable way. Village Common Forest (VCF), solely managed by the indigenous communities in CHTs, would be an influential model in this regard.

Village Common Forest (VCF) is a natural forest other than the government reserve forest around the households of the indigenous communities and is managed to fulfil their daily demands. The birth of community-managed VCF in the CHT is a direct result of resource constraints caused by deforestation and the prevention of entry into and use of the resources of the newly acquired reserved forests (which were promptly declared off limits to local people). These constraints led local communities to devise newer and more sustainable modes of the natural resources management. One such innovation, drawing upon indigenous traditional methods of forest fallow and Jhum cultivation, gave birth to the VCF during the first quarter of the 20th century.

Between 1871 and 1885, three-fourths of CHT's land was declared as government forestland by the British colonial government and the remaining area, except some privately owned land obtained through leasehold or freehold, declared as 'khas land' (government owned fallow land, where nobody has property rights) (Rasul, 2007). One forth of the government forestlands (1,345 sq km) were declared as Reserved Forests (RFs), where any rights of indigenous people including those of collection of fuel wood, fodder and Jhuming were totally denied.

Of late, the government declared the rest of the government forests as Unclassed State Forest (USF), where indigenous peoples' customary rights are allowed (Ibid.). These forests are common forests and all the members of the adjacent community have equal rights over the resources under certain guidelines.

In 1900, according to CHTR (Chittagong Hill Tracts Regulation) manual Headman of each Mouza had given power to manage the forest within a Mouza. It is reported that since 1939, traditionally the indigenous communities had been managing the forests around their homesteads in CHT. In the face of continuous forest degradation government issued a circular to Headman of each Mouza to raise and conserve VCF in 1965. Currently, it is estimated that VCF covers 202 ha of land in CHT (Chakma, 2005).

Village common forest is managed as common property resource by the villagers. Generally, the community groups manage the VCFs under the leadership of Mouza Headmen. The management of these forests is based on traditional resource management pattern, where Jhuming is not allowed. The community themselves decide through a meeting when and what to harvest from VCF for their domestic uses.

Every VCF is run by a Forest User Group (FUG). The village headman is the head of the group and the villagers are the members of group by regulation. However, the system is more or less democratic and after every three years the executive committee is elected by the members of the user group. The indigenous communities are guided by their traditional norms and select the same headman as the head of the group until he is dead or physically disabled. The user community collectively set the rules of VCF management and punishes the rule breaker.

Even though individual extraction is restricted in VCF but with permission from the executive committee, individual families may extract wood and other natural resources for their domestic uses. The villagers also sell some of the forest produces, usually bamboo and less occasionally timber to meet community needs for school and temple construction and for emergency medical expenses.

There are no written rules for VCF management. All the rules are traditionally followed. Moreover, the rules are not same in all the VCFs. These differ with different ethnic communities and also with local condition. However, some rules are common for all the VCFs and these are followed strictly with the provision of penalties or sometimes exclusion from the clan in case of rules violation:

- All fire works are restricted in the VCF area;
- Without prior permission of the forest management committee (executive committee) access is restricted to the VCF;
- If any body cuts bamboo without permission, he has to pay Tk 50 as penalty for each bamboo;
- Every year new plantation should be done in VCF by the members;
- Immature bamboo extraction is restricted;
- The executive committee will approve the requirement of forest resources in general meeting before starting extraction;
- Commercial selling is forbidden unless the committee decides to spend the money collected from the sell of forest products in community development (developing prayer place, school, roads etc);
- Committee can give permission to outside villagers to collect forest resources in case of emergency;
- Harvesting of bamboo is generally done after 2 to 3 years;
- Hunting is strictly forbidden in all the cases;

VCF plays important role in conserving forest resources as well as fulfilling other demands of the forest dependant communities. The indigenous communities are managing VCFs around their homesteads for the following reasons:

- To maintain tree cover and protect the environment in the face of rapid deforestation.
- To maintain a diversity of plants and animals (including herbs and plants used in herbal medicine), which have significant potentiality in modern medical science.
- To sustain a supply of wood and bamboo required for house construction and fuel consumption.
- To reduce the pressure on government managed reserved forest for forest products.
- To preserve the drinking water sources as many VCFs contain headwaters of streams, natural springs and other aquifers.

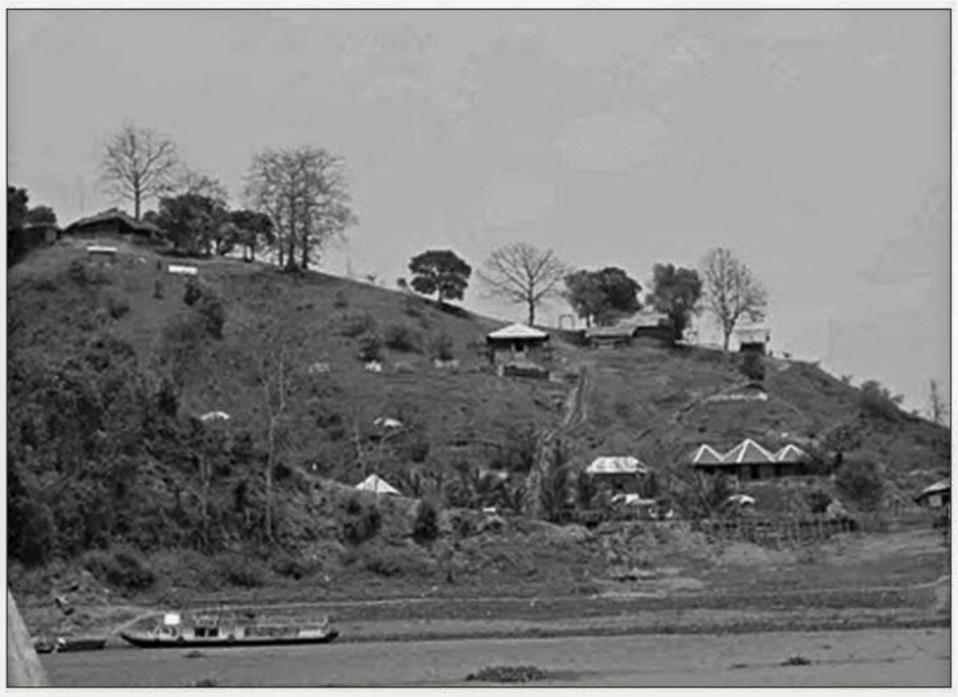
The VCFs are also related to the religions, cultural beliefs, rituals and ceremonies of many indigenous people.

Village Common Forests, managed by indigenous communities, have set a standard model for the protection of biodiversity, environment and natural resources in CHT. Forest resources of VCFs are used to develop educational, religious institutions and in making shelter for poor people. In some areas mature trees and bamboos are sold to create a fund to be used in disaster time. These forests provide indigenous communities with pure drinking water in inaccessible hilly areas by keeping annual and perennial springs and small rivers into sustained flow.

VCF villages are found rich of natural forest resources and people are inextricably linked with VCF for their day-to-day needs. As VCF villagers have no access and rights inside the government owned reserved forest, therefore, various forest products from VCF such as bamboo, wood, medicinal pants, natural dyes and fuel wood have played a significant role in their livelihood. Among the forest products, bamboo is estimated to be the highest one utilized by VCF-community reasonably for domestic purposes as well as a source of income.

Moreover, the production rate of agricultural crop is satisfactory in VCF villages. From the study, it is revealed that rice, ginger, turmeric and different types of vegetables sales provide high economic surplus to many households in VCF villages. Horticultural crops are now increasingly grown to replace cereals or vegetables. On one hand, horticultural crops ensure food security, on the other, these enhance income of VCF communities to a great extent. VCF has protected many seasonal and perennial water bodies which provide not only drinking water and fish protein, but also enhances agriculture production.

The issue of deforestation and environmental degradation in CHT has received increased attention in recent years. One important concern is the efficiency of the land that is managed, particularly forestland that is communally owned. However, it is very difficult to conserve the forests without considering the livelihood options of the dependant communities. In this regard, VCF would be an influential model for maintaining a balance between conservation and exploitation that can be replicated in the mainstream forest management programme to halt current trend of deforestation.



A CHT locality: Diminishing forestry.

Water resources in VCF: Perennial (left), annual (right)

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