

The Causes of Deforestation and Loss of Genetic Resources in Bangladesh

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ABSTRACT

Almost all the people, particularly the rural people are directly dependent on the continued productivity of natural resources, like water, soils, forests and fisheries. But the overuse by the extremely high population pressures has degraded the natural resources into severe widespread deforestation. The degradation of natural resources, particularly the plant resources has been a great concern for socio-economic and sustainable development of the country. The Forests in Bangladesh have been depleted and degraded in volume, area, and quantity, thus requiring urgent forest protection by identifying the causes of forest loss. There are so many causes of deforestation and loss of genetic resources such as; the timber industry, which, legal or not, are cutting too many trees; indigenous forest dwellers, having their own types of problems; migrants, who, because of problems in their places of origin, have decided to move to the forests and the government through its Forest Department which is not able or willing to implement suitable policies to regulate the cutting trees and to prevent illegal cutting. Because it is a time consuming task to mitigate the first and second sets of factors, we recommend involving forest dwellers in forestry practices as much as possible and taking necessary steps to alleviate the third and fourth sets and thereby reduce the rate of forest depletion. Accordingly, a number of strategies that should be adopted to halt the loss of remaining forest cover are discussed.

Key words: Deforestation, Genetic resources, Diversity, Species.

INTRODUCTION

Many species, once plentiful, are now found in smaller numbers and some are considered to be threatened. Many species of crops and forest tree have been over exploited. Some of the species are endangered. Genetic degradation occurs from more purposeful human action intended to increase food production. Bangladesh has a total area of 14.39 million hectares, of which 9.12 million ha is cultivated, 2.14 million ha public forests, 0.27 million ha village groves, and 1.64 million ha

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constantly under water. The remaining land area (1.22 million hectares) is occupied by tea gardens, uncultivable areas, rural and urban houses and ponds (Kibria et al. 2000).

The area covered by government and village forests is about 16% of the total land area; however only 0.93 million ha (6.5%) is under tree cover, which is about 40% of the forests controlled by the government. The remaining 60% includes denuded lands (grassland, scrubland and encroached areas). About 24,000 ha of forest is lost annually as a result of homestead development, urbanization and deforestation (Anon 1992). The contribution of forestry to the national Gross Domestic Product (GDP) at current prices has been estimated to be 3.28% (BBS 1994). The supply of various forest products such as timber, poles, fuelwood, bamboo, etc. cannot meet the present demand. Village forest areas, being one-tenth of the national forest area, supply 70% of sawlogs, 90% of fuelwood and 90% of bamboo consumption of the country (Douglas 1982). The gap between demand and supply has been increasing with the increase in population. This gap may be narrowed through the establishment of plantations of fast growing trees in the denuded forest areas, wastelands as well as homestead areas.

Bangladesh, located in the humid tropical region is rich in species diversity and is unique in the diversity of genetic resources compared to its land area. It has about 5700 species of angiosperms and four species of gymnosperms (Khan 1977; Troup 1975) of which some 2260 species are reported from the Chittagong region (Anon 1992).

Khan (1996) reported that there are about 86 timber species, 130 species yielding fiber and 29 medicinal plant species available in the country. The Bangladesh National Herbarium (BNH) prepared a list of 500 medicinal plants. Bamboo resources of 18 taxa, both wild and planted are available in the country (Alam 1982). There are at least nine species of rattans, including a recently reported one (Alam and Basu 1988), along with 12 other palm species (Khan 1996). However, it must be noted that comprehensive information on forest genetic resources (FGR) is not available in the country. Information on species diversity in terms of (i) chromosome numbers, (ii) morphological variation, (iii) flowering and seed production habits, (iv) flowering time and nature and (v) seed morphology and viability, etc. are available only for a few agricultural species. Forest species are neglected in this respect (Hassan 1995).

Flora of Bangladesh is still poorly studied and so there remains a serious lack of information on the rare and endangered species. However, it has been reported that some 45 forestry species are currently threatened with extinction (Khan 1995), and many other important forest species are now at risk of being lost in all or part of their distribution ranges because of reduction in their population number and loss of habitats. A large number of medicinal plants and other wild resource species are reported to be disappearing rapidly in Bangladesh due to destruction of natural habitats (FAO 1994). 24 vascular plant species have been threatened in Bangladesh of which 1 species is extinct/endangered, 21 species vulnerable, 1 rare and 1 indeterminate. The Bangladesh National Herbarium also listed 106 plant spp. as endangered (Khan 2001). Another 23 vascular tree spp. have been reported as rare and threatened (Das 2001). The threat of extinction is mainly brought about by the degradation and encroachment of habitats due to rapid industrialization and urbanization, illegal grabbing of forest land and unsustainable harvesting of wild species.

CAUSES OF DEFORESTATION

Deforestation is occurring at an alarming rate in Bangladesh. Each year approximately .3% of forest cover disappears. International development agencies and intergovernmental groups blame overpopulation and underdevelopment. Non-governmental organizations attribute deforestation to transnational companies, development agencies, and over-consumption of Northern industrial nations. There are many causes, ranging from slow forest degradation to sudden and catastrophic

clearcutting, slash-and-burn, urban development, and wildfires. Deforestation can be the result of the deliberate removal of forest cover for agriculture or urban development, or it can be a consequence of grazing animals, primarily for agriculture. In addition to the direct effects brought about by forest removal, indirect effects caused by edge effects and habitat fragmentation can greatly magnify the effects of deforestation. Generally loss of biodiversity is highly correlated with deforestation.

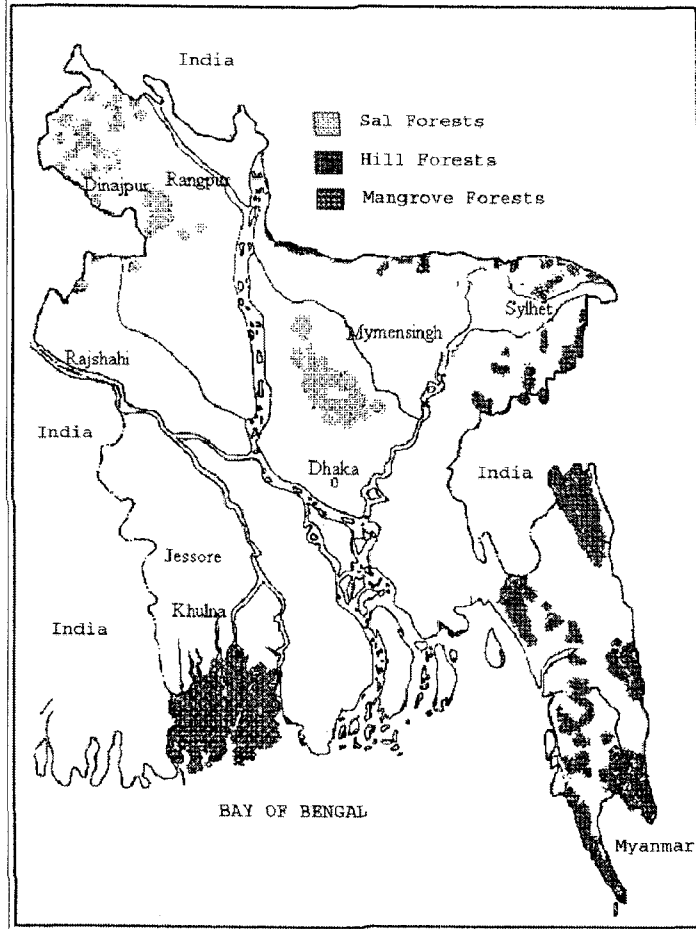


Fig.1. Map showing different kinds of forest region in Bangladesh.

1. Pressure from Human Settlement and Its Causes

Many development institutions and politicians regard population pressure as the major factor causing forest destruction. Nobody can deny the serious global problem of population growth. However, the belief that this is the main cause of forest loss is used by many governments and businesses to imply that there is little or nothing they can do about the problem of forest destruction. An examination of forest destruction on a regional basis reveals that this is not so. In fact it is large companies and the inequities of international trade which are the root causes of forest destruction.

For instance, millions of hectares of primary rainforests are being destroyed in South East Asia by logging, and the driving force in this industry is not the local population but international demand for timber. Because landless people will follow logging roads into primary rainforest areas, it is the logging industry which is the main immediate factor responsible for colonization of rainforest.

In Central America, 40% of all the rainforests have been cleared or burned down in the last 40 years, mostly for cattle pasture to feed the export market (often for US beefburgers). This industry in particular and the continuing consolidation of land ownership in general, force the poor into rainforest in their search for land. Throughout South East Asia there are the people who have the same desperate need for land. Land reform would not only provide for the needs of the poorest people in these countries, but would also halt conversion of new areas of primary rainforest into unsustainable agricultural lands.

2. Commercial Logging

Commercial logging is the major cause of primary forest destruction in South East Asia and Africa. Worldwide, it is responsible for the destruction of 5 million ha. a year. Logging roads enable landless people to enter the forest. In Africa, 75% of land being cleared by peasant farmers is land that has been previously logged.

The World Rainforest Movement points out that "virtually all rainforest lands are managed by and provide for local cultures" and that logging is part of the development paradigm that refuses to recognize this. Logging usually involves transfer of control of the forests from the local people, who have a vested interest in their preservation, to those who are interested only in destroying them for short term profit. Such disempowerment of local people is common to much environmental destruction.

The cash crop economy is an integral part of Bangladesh" development" and a major cause of deforestation. The best land is taken to earn export income, which is all too often used to service foreign debt. Peasants are forced onto marginal lands, resulting in deforestation, land degradation and poverty. In Malaysia, over 3.5 million ha. of forest have been cleared for rubber and oil palm plantations.

3. The over-exploitation of forests for timber, fuel, agricultural land, and other basic needs has led to widespread deforestation and pollution - wiping out more than half of the world's original forest cover. As a results loss of forest genetics resources in Bangladesh forests are lost every year.

4. Fuel half of the trees felled across the country are used for fuel. In less developed countries it is difficult to find alternative sources, particularly in rural areas. The burning of animal dung, for instance, removes an important fertilizer and reduces crop production.

5. Wood and paper consumption, primarily in industrialized countries, is one of the primary factors driving global deforestation. At least half of the world's timber and nearly three-quarters of world's paper is consumed by a mere 22% of the world's population, those living in the United States, Europe and Japan.

6. Agriculture Forests are also cleared to grow crops. In the hill tracts, large-scale farming is a profitable industry and vital for the region's economy. Unfortunately, environmental protection laws are widely flaunted by farmers and the forests suffer accordingly.

7. The activities of multinational corporations, particularly resource extraction corporations involved in mining, oil extraction and logging, are one of the leading causes of forest destruction. Even when these activities aren't directly responsible for large-scale forest destruction, they create

the infrastructure that opens the way for the degradation of forest areas.

8. Mega-Projects are massive infrastructure projects - for example, the pipelines, power lines, roads, dams, and waterways that are designed to open up the forest frontier to industrial development in Bangladesh. Mega-projects enable industries to extract and export raw materials, etc.

DIVERSITY OF PLANTS IN BANGLADESH

Bangladesh is unique in having a wide variety of plant species with enormous genetic diversity. About 5700 species of higher plants have been recorded so far (Hossain 1995), and of these some 260 species are used as crops (Mondal 1990). The rest of the species are virtually left on growing in natural forests, village thickets and jungles which have been important sources of fruit and nuts, fuel and fodder, medicinal plants, bamboo, rattans, palms, ornamentals and aromatics. Some 60 species of both minor and underutilized fruit and nut species are common in natural vegetations which are locally being consumed as food (Das 1987). More than 600 wild medicinal plant species are potentially being used for human ailments and veterinary medicines. There are 18 species of bamboo, 20 species of palm and 8 species of rattans are occurring both wild in the forest and cultivated in rural households (Alam 1990). Numerous other wild resource species, eg. orchids, bromeliads, anthuriums, heliconias, cacti are also abundant in the forests and village jungles.

DEFORESTATION AND LOSS OF GENETIC RESOURCES

The continuous depletion of forest genetic resources, especially of Bangladesh forests, remains one of the most urgent conservation problems. Concerns for the conservation of Bangladesh forests are supported by a continued high rate of deforestation. FAO's Industrialisation, intensified land use and introduction of high yielding varieties of seeds, rapid urbanisation, rural infrastructural growth and over harvesting of natural resources coupled with population boom have put severe stress on the environment, resulting in the destruction of ecosystems and habitats and depletion of the biological resource-bases of the country both in the wild as well as cultivated states occurring at the ecosystem, species and genetic levels. The annual deforestation rate up to the 1990s is estimated to be 3.3 per cent in Bangladesh whereas the same in South Asia is about 0.6 per cent. Per capita forestland has been decreased from 0.035 hectares in 1969 to around 0.02 hectares in 1990, one of the lowest in the world.

Over the last 100 years Bangladesh has lost about 10 per cent of its mammalian fauna, 3 per cent avifauna and 4 per cent reptiles. Already 64 species of vertebrates, 40 species of mammals, 38 species of birds, 21 species of reptiles and 23 species of fish can no longer be found in Bangladesh. About 100 of the estimated 6,000 vascular plant species in Bangladesh are on the verge of extinction. Many plant and insect species are not seen which were prevalent 30 years ago or so. Losses due to extinction are irreversible and represent the greatest environmental tragedy of our time. As well as species extinction, there is a continuing loss of unique populations and genetic diversity, as well as unique habitats and ecosystems (Bawa 1997).

Major interventions that can pose threats to genetic resources are deforestation, habitat degradation, conversion for agriculture resulting in forest fragmentation, over-exploitation of timber and uncontrolled extraction, genetic and atmospheric pollution and climate change. These interventions can lead to extinction and a complete loss of genes or gene combinations; and to reduction of genetic variability within populations, to overall loss of intraspecific diversity, as well

as to hybridization between native stands and plantations established from introduced species and provenances which, in turn, can lead to losses of local adaptability.

CONCLUSION AND RECOMMENDATIONS

The natural forests of Bangladesh have been seriously degraded, resulting in serious genetic erosion of forest genetic resources. There is a critical need to develop coordinated efforts to conserve and manage forest genetic resources. Effective and hopeful efforts have been developed into conservation activities, but national and international financial and technical assistance are needed to bring about success. The following recommendations have been put forward for the conservation and sustainable utilization of forest genetic resources in Bangladesh

1. The method of clear-felling followed by burning for plantation establishment must be stopped.
2. Community-based resource conservation needs to be emphasized.
3. Enrichment planting should be conducted in the forest gaps with diversified genetic resources collected from natural regeneration in the forest floor.
4. Establishment of preservation plots and permanent sample plots in the reserved forest.
5. Awareness should be developed among the shifting cultivators about the detrimental effect of shifting cultivation.
6. Enrichment planting should be conducted in the forest gaps with diversified genetic resources collected from natural regeneration in the forest floor).
7. Enforcement of strict laws in the form of severe punishment for illegal logging and for collusion in illegal logging.
8. Establishment of a strong link between conservation and poverty alleviation.
9. Conducting of a forest inventory, to emphasize information on the availability of forests for wood supply, the protection status of forests, the nature and extent of legal and illegal felling, the environmental benefits of forests, and the negative environmental consequences of existing forestry activities.
10. Adoption of a participatory forestry module involving local residents in conservation, restrictive/selective felling in the case of plantation forests.
11. An intensive study on the effects of clear felling on biodiversity, the environment, and the forest ecosystem, and the replacing of clearfelling by selective felling with enrichment planting, if results indicated that the former causes severe damage from social, economic, and environmental viewpoints;
12. Prioritizing by conservation planners on choosing areas that should remain natural forests, as well as areas to be converted to plantation forests.
13. Establishment of a genebank for conservation of FGR.
14. Logging in the remaining natural forests must be stopped.

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