

Sustainable uses of waste ground

Restoring inflicted urban biodiversity

MD LUTFOR RAHMAN

WASTE disposal methods have rapidly been changed since last decade in many developing countries, and our country is also following the same way of controlled disposal of waste. Increasing amount of different forms of waste is coming out from different urban areas of Bangladesh; especially solid waste generation is mounting proportionately with the growth of urban population. Most of the wastes go to the specific places called Dumping Ground or Waste Ground, which are also scientifically known as Landfill Sites.

According to a JICA study in 2004, around 3,200 tonnes of solid waste is generated every day in Dhaka city and only 44 per cent of that was possible to be collected and dumped in landfill sites. Waste landfill sites might anyway cause manifold environmental problems if not restored through proper planning and management, and could create noxious landscapes vulnerable to environment in the urban neighbourhood. After dumping wastes on the ground, the area ought to be covered with a thick layer of ordinary soil to protect environment from pollution, and thus it could increase public acceptability within the city area. Most of the landfill sites in the western countries are capped with clay soil to stop infiltration of water, and also have been installed with proper drainage for biogas and leachate collection.

Urban areas of Bangladesh entangle sizeable pockets of waste grounds that are normally unsuitable for other purposes and could be reclaimed as green spaces with different types of grasses and shrub species. These could act as wildlife habitat and enhance remnant semi-natural urban areas which might very well edify the beauty of urban landscapes. High-quality green space enhances the standard of urban living and contributes to improve urban serenity for better health. The expansion

of urban development, folded with high rate of population growth leads to unscrupulous exploitation of nature, resulting in an endangered ecology, which is alarming to the urban habitats.

Urban green spaces have ameliorative influences over ecological environment of the city as well as psychological contentment of the urban population. Thus urban

opment interventions and activities. The unplanned rapid urbanization and industrialization are leading to problems that relentlessly affect natural ecosystems. As a result, the flora and fauna populations are being seriously threatened.

Restoring these landfill sites could be way of recovering or sustaining some threatened wildlife species in urban

for the restoration of these areas though these have many advantages in environmental, functional and aesthetic aspects for local neighbouring residents.

Land rehabilitation of these habitats include establishing diverse plant communities on these lands though determining a suitable revegetation strategy for restoring waste landfills is a very complex problem. Protocols to accomplish restoration goals must be developed, including procedural formalities that acknowledge many environmental concerns and it should be addressed by City Corporation or concerned local bodies.

Ecological constraints of these waste ground will determine the viability and financial constraints as well as the expediency while social constraints will determine the acceptability of restoration type. The importance of public acceptance of restoration increases with the intensity of human settlement in the surrounding landscape. In landscape dominated by human activity, local support for restoration projects can translate into social buffers that can greatly enhance habitat quality and increase effective habitat area.

The need for effective habitat restoration is optimistically growing, but we must move beyond simply drawing line on maps. There are still numerous major challenges to those engaged in restoration of such degraded land. These habitats are chronically hostile to plant survival and growth, and require revegetation and sufficient care and after-care to ensure that their floristic and faunal interest is retained and subsequently attractive species are maintained for amenity purposes. We need to render much greater efforts to develop methods for disposal and subsequent restoration.

MD. LUTFOR RAHMAN is a researcher, Landscape and Biodiversity Research Group, University of Northampton, UK.

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greenspace can provide the minimum requirements of natural setting to prevent mental alienation of people from nature. Creating greenspace by restoring landfill sites can improve the optimal carrying capacity of the existing urban recreational area. In many developed countries, landfill sites are usually restored with grassland or woodland for public amenity space. The prospects of using restored landfill sites to ameliorate biodiversity are strong enough to deserve attention.

Bangladesh has merely 8-10 per cent of the land area that is under good canopy cover which supports approximately 5700 species of angiosperms. The IUCN Bangladesh Red Data Book (2000) has 22 amphibians, 109 inland reptiles, 388 resident birds, 240 migratory birds, 110 inland mammals in Bangladesh. This alarming rate of depletion of biodiversity is the consequence of malpractices of various kinds of human devel-

habitats. It would certainly be wise to select native species for revegetation of these lands that could attract local wildlife. Most of the plantations in our country are done with foreign fast growing species which is thought to be one of the reasons for our wildlife depletion. Native wildlife lost their habitat by this way and find no way to adopt their suitable habitat in exotic plantations. Restoring waste ground to either grassland for public open space or short rotation local species plantation can enhance total landscape quality.

Due to scarcity of fallow land or open space in major urban areas of Bangladesh, government departments and local authorities can attempt to restore these dumping grounds at certain selected locations. Closed or abandoned landfills or garbage disposal grounds represent significant land areas in urban territory, which are potential sites for ecological restoration. But there are no current guidelines which could allow

Rethinking social safety-net

Adapt to climate change

RADYAN RAHAVE AND AZMARINA TANZIR

PRESENT Social Safety Net Programmes (SSNPs) protect vulnerable people against economic shocks and have a bias for the economic approach towards livelihood, more precisely in the form of grants in kind or cash or some work provisions for food or cash. It has been conceptualized keeping in mind the economic issue like income generation, overshadowing other equally important aspects of life like water, sanitation, nutrition, education and health (psychosocial care) that are frequently affected by climate change. The solution is to redesign safety nets in Bangladesh in ways that would increase their benefit for poor and vulnerable households coping with disasters and climate change. Addressing new vulnerabilities from climate change requires diversification of safety nets in order to reduce risk and increase resilience of people across the country.

In Bangladesh almost 75 per cent of the people are dependent on agriculture as their source of livelihood, either by land and crop or physical labor as means of income and employment. Considering the climatic hazard map of Bangladesh, 60 per cent of the land area is exposed to large scale floods, which is almost certain at two years interval. 35 per cent of the country is exposed to cyclones, which is also almost certain at similar interval. Tidal flooding and flash floods are almost certain every year on 30 per cent land in coastal and hilly areas. Drought in northwest and southwest is almost certain each year and increasing its trend in 35 per cent country area.

Excessive rainfall and drainage congestion create water logging in southwest Bangladesh and some other parts including Dhaka and Chittagong city, which covers almost 20 per cent of the land. Salinity intrusion to freshwater zone is also a slow onset hazard and almost 30 per cent of the coastland is saline and it is expanding towards the central zone of the country.

Analyzing the climatic hazard portfolio, this is evident that almost 95 per cent of the area of Bangladesh is exposed to at least one climatic hazard and in many areas multiple hazard is very common. The exposure of these climatic hazards on fragile agricultural system poses great risk for the whole of the country and thus the need of safety net is increasing.

The need for social protec-

preciously in the area of reducing loss of life. However, the flood 2004, flood 2007 and cyclone SIDR 2007 indicate increasing economic loss, which posed severe impacts on the development gains of the people. Food security of poor and marginal people in the context of such high exposure climatic hazard is identified as critical concern. Therefore, the resilience of people's livelihood and

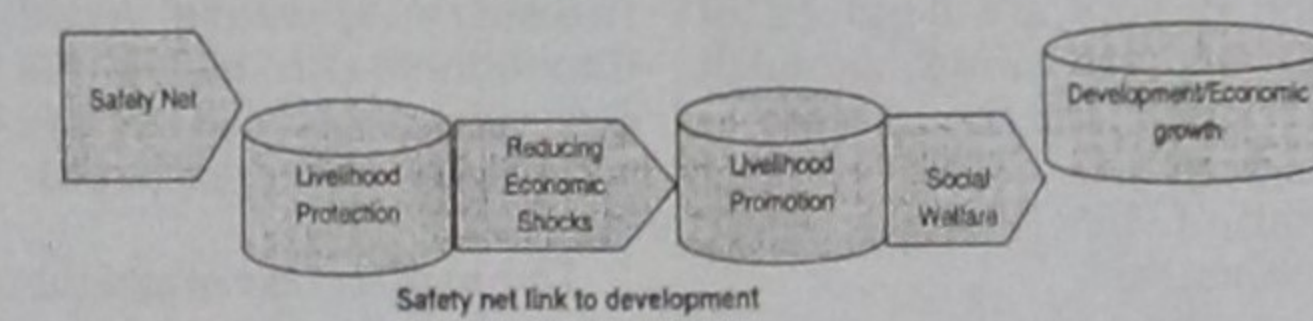
adapted with climate change. (Yamin, E and Hug, S, (2005), 'Vulnerability, Adaptation and Climate Disasters', IDS Bulletin 36.4). As approaches to minimizing the risks faced by the vulnerable people, social safety net and climate change adaptation have much in common, as they both seek to protect the most vulnerable and promote resilience. Yet they remain somewhat disparate fields of research, policy and practice.

While social safety-net aims to build resilience to some climate-related disasters in medium term range (6 month-1 year), insufficient attention has been placed in the social safety-net sphere to the long-term risks posed by climate change. Likewise not a single safety net programme has got nationwide coverage although the problem prevails across the country. Inclusion of the ineligible or exclusion of eligible persons for senior citizens programme is a common experience. Why do we not use RPA in that regard for finding most deserving person in the community? At present, there are 47 well recognized SSNPs which have been implemented by different ministries or agencies but no linkage can be found among them. For smooth implementation all small programmes those should be brought under one umbrella.

The safety net programme was designed to sustain critical lifeline in threat condition, which was historically linked with relief and rehabilitation 'niches'. Removing its bias for economic approach towards livelihood and addressing new vulnerabilities from climate change requires redesigning and diversification of the existing safety net programmes. The programmes should concentrate on nationwide coverage and adopt long term approach to build resilience and reduce poverty.

Radyan Rahave is a development worker and social entrepreneur. E-mail: radyanb@gmail.com
Azmarina Tanzir is a development worker. E-mail: tanzir15@gmail.com

Social safety net initiatives are as much at risk from climate change as other development approaches. The safety-net is regarded as a means to achieve some goals like poverty alleviation, reduction of vulnerability, decrease of disparity, crime reduction, recovery from illness, home for the shelterless, human development, opportunities to earn a livelihood etc. It is unlikely to succeed in reducing poverty if we do not consider both the short (3 months to 6 months) and long-term (1 year to five year) shocks and stresses associated with climate change.



tion to take a long term approach is increasingly recognised while climate risks heighten this need. Climate change also threatens the effectiveness of social protection measures in reducing consequences as Bangladesh is highly exposed to intense and recurrent climatic hazards like flood, cyclone, tornado, drought, salinity, water logging, river bank erosion, heat and cold waves, hailstorms and nor easter. Poor and marginal people, especially agriculture dependent rural population are extremely vulnerable to such climatic hazards.

People of Bangladesh have demonstrated resilience to the floods and cyclones, more

wellbeing to climatic hazards in a changing nature (due to climate change, frequency has increased) is at risk.

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Protecting our forest resources

MD. MAHFUJUR RAHMAN

IN Bangladesh forest lands account for only 17 per cent of total land area that includes classified and unclassified state lands and homestead forests and tea/rubber gardens. In case of private forests, the data represent the tree-covered areas. Of the 2.52 million hectare forest land, Forest Department manages 1.52 million hectare which includes Reserved, Protected and Acquired forest and Mangrove forest on the newly accreted land in estuaries of major rivers. The remaining 0.73 million hectare of land designated as Unclassified State Forest (USF) is under the control of Ministry of Land. Village forests (homestead land) form the most productive tree resource base in the country and accounts for 0.27 million hectare.

Type and composition of forest

Depending on their location, nature and type of management of the forests of Bangladesh can be grouped into three broad categories:

- Mangrove forests
- Tropical evergreen and semi-evergreen forests
- Tropical moist deciduous forests

Mangrove forests

i. Natural mangrove forests: Sundarban, the largest single tract of natural mangrove forest, is situated in southwestern Bangladesh and West Bengal, India. Our Sundarban consists of a total of 6,01,700 hectare which is 4.07 percent of total land mass of the country and 40 percent of total forest land. Sundarban harbours 334 species of trees, shrubs and epiphytes and 269 species of wild animals. It is famous as home to the world renowned Royal Bengal

Tiger (*Panthera tigris tigris*). 1,39,700 hectare forest land of Sundarban is declared as World Heritage Site where three wildlife sanctuaries viz. Sundarban East, Sundarban West and Sundarban South are located.

Sundri (*Heritiera fomes*) is the most important tree species in the Sundarban which is distributed over 73 percent of the reserve. Extent of Sundri is followed by Gewa (*Excoecaria agallocha*), Baen (*Avecinia officinalis*), Passur (*Xylocarpus mekongensis*), Keora (*Sonneratia apetala*) etc. There are some other non-wood forest products like Golpata (*Nypa fruticans*), honey, wax, fish, crab etc which are also of high value. According to the forest inventory of 1998 there is 12.26 million cubic meter timber available from the species of Sundri, Gewa, Keora, Baen, Dhundul, Passur etc with 15cm and above diameter.

Besides being the home of Royal Bengal Tiger, Sundarban is a unique habitat for a number of wildlife. Among them some mammals are Gangetic Dolphin (*Platanista gangetica*), Monkey (*Macaca mulatta*), Indian Fishing Cat (*Felis viverrina*), Indian Otter (*Lutra perspicillata*), Spotted Deer (*Axis axis*), etc. Reptiles like Estuarine Crocodile (*Crocodylus porosus*), Civit (*Swintonia floribunda*), Toon (*Cedrela toona*), Bendorhola (*Duabanga grandiflora*) etc. Moreover there are bamboo, cane, climbers and fern etc. in these forests in plenty.

These forests have been brought under plantation programme since 1871. At present, plantation activities are being conducted under development projects. Some valuable plantation species are Teak (*Tectona grandis*), Gamar (*Gmelina arborea*), Mehogani (*Svietenia spp.*), Chapalish (*Artocarpus chaplasha*), Jarul

partners the afforestation programmes are extended over foreshore islands, embankments and along the open coasts. Since 1960-61 up to 1999-2000, 142,835 hectare of mangrove plantations has been raised under several coastal afforestation projects. The present net area of mangrove plantation is 132,000 hectare after losing some area due to natural calamities.

Tropical evergreen and semi-evergreen forests

Tropical evergreen and semi-evergreen forests are extended over Chittagong, Cox's Bazar, Chittagong Hill Tracts and Sylhet totaling an area of 6,70,000 hectare which is 4.54 percent of total land-mass of the country and 44 percent of national forest land. Depending on the topography, soil characteristics and climate these areas are categorized as i) Tropical wet evergreen forests and ii) Tropical semi-evergreen forests.

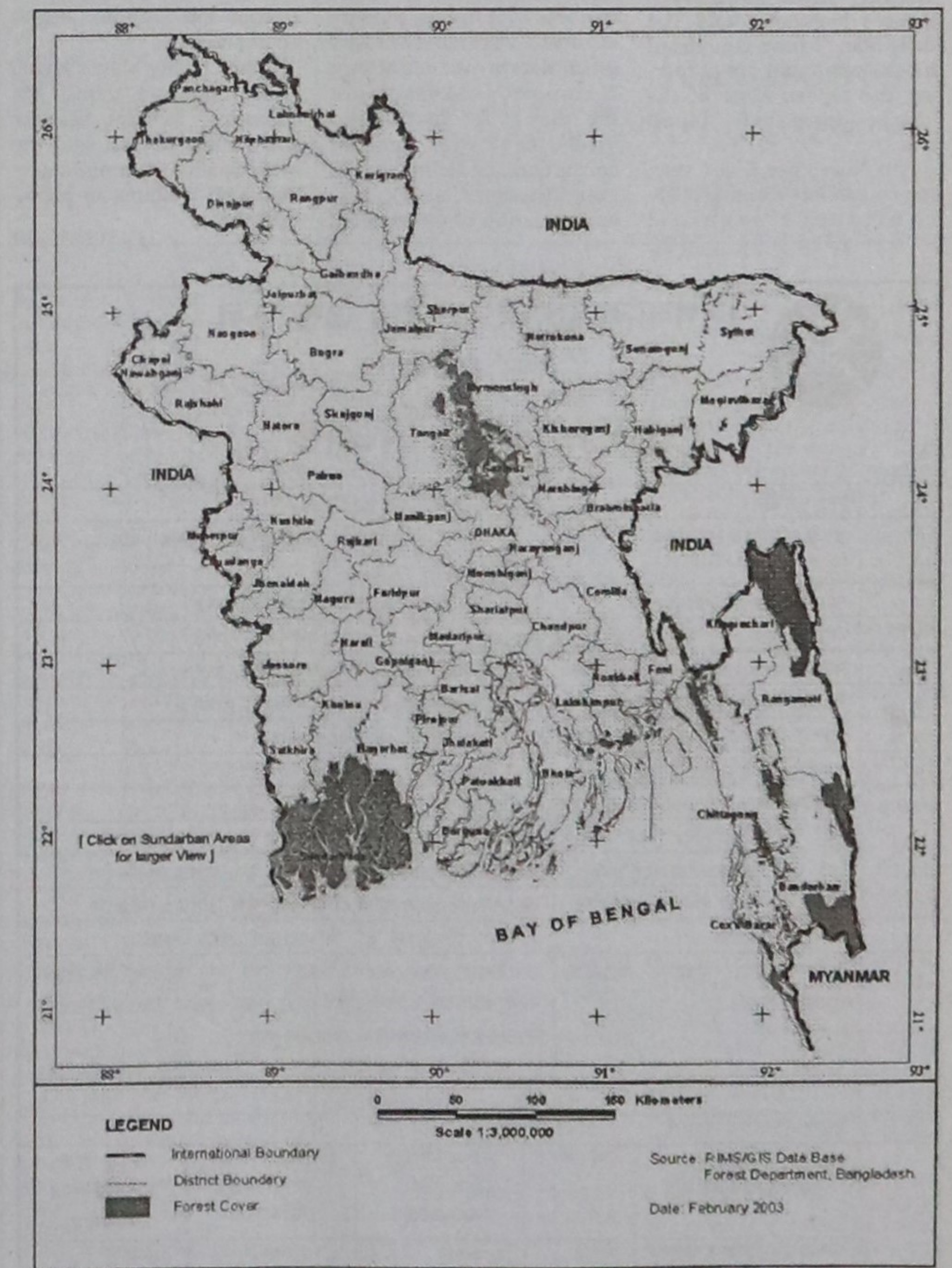
The hill forests are abundant with numerous plant as well as animal species. Some important flora are Garjan (*Dipterocarpus spp.*), Chapalish (*Artocarpus chaplasha*), Telsur (*Hopea odorata*), Tali (*Palaquium polyanthum*), Kamdeb (*Calophyllum polyanthum*), Uriam (*Mangifera sylvatica*), Jarul (*Legarstomia speciosa*), Civit (*Swintonia floribunda*), Toon (*Cedrela toona*), Bendorhola (*Duabanga grandiflora*) etc. Moreover there are bamboo, cane, climbers and fern etc. in these forests in plenty.

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(*Legarstomia speciosa*), Koro (Albizia spp), Chikrassi (*Chikrassia tabularis*), Pynkado (*Xylocarpus dolabriformis*), Kadam (*Anthocephalus cadamba*), Telsur (*Hopea odorata*) etc. Among the mammals Elephant (*Elephas maximus*), Monkey (*Macaca mulatta*), Wild Boar (*Sus scrofa*), Barking Deer (*Muntiacus muntjak*), Sambar (*Cervus unicolor*), Indian Leopard (*Panthera pardus*), among the reptiles King Cobra (*Ophiophagus hanna*) Monitor Lizard (*Varanus salvator*) and Bengal Monitor Lizard (*Varanus bengalensis*) are remarkable.

Tropical moist deciduous forests

The central and northern districts covering an area of 1,20,000 ha, about 0.81 percent of total land mass of the country and 7.8 percent of the country's forest land are bestowed with Tropical Moist Deciduous Forests. This forest is intermingled with the neighbouring settlements and fragmented into smaller patches. Sal (*Shorea robusta*) is the main species there with other associates like Koro (*Albizia procera*), Azuli (*Dillenia pentagyna*), Sonalu (*Cassia fistula*), Bohera (*Terminalia belerica*), Haritaki (*Terminalia chebulu*), Kanchan (*Bauhinia acuminata*), Jarul (*Legarstomia speciosa*), Jam (*Syzygium spp*) etc. A recent forest inventory encountered that 3.75 million cubic meter wood is available in the sal forests. Presently participatory forestry programme is being implemented under the social forestry initiatives. Among the mammals, Jackal (*Canis aureus*), Monkey (*Macaca mulatta*), Wild cat (*Felis chaus*) etc. are found there and among the reptiles Bengal Monitor Lizard (*Varanus bengalensis*) and common cobra are remarkable.



Map: Forest coverage of Bangladesh

Conclusion

The extent of forest cover and health of forest ecosystems are among some vital environmental indicators of a country. It is recommended that about one fourth of a country should be forestland for maintaining an ecological balance. However, the quantity and quality of forest

resources in Bangladesh is deteriorating with time. The original natural forest cover is less than six percent of the land area. Most of the forestland suffer human encroachment or contain artificial plantation. Though different plantation programmes increased the vegetation cover of the country but we have to remember

in mind that plantation is not equal to forest cover. Urgent action should be taken by government to protect the natural forest cover of Bangladesh.

MD. MAHFUJUR RAHMAN works for Center for Environmental and Geographic Information Services (CEGIS), a public trust under Water Resources Ministry.