

Greening Bangladesh

Celebrating the World Environment Day

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THIS year's World Environment Day titled "Forests: Nature at Your Service" is not just a call for one day of awareness, but can usher the beginning of an determined move towards the conservation of Bangladesh's remaining forest cover. It underscores the intrinsic link between quality of life and the health of forests and forest ecosystems, and supports this year's UN International Year of Forests. This is therefore a call to strengthen our resolve towards afforestation and other necessary measures for a truly "green" Bangladesh.

The World Environment Day is especially significant when considered from the perspective of present day climate and environment realities. Forests cover a third of our globe's land mass, performing vital functions and services around the world which allow our planet to be teeming with life and its endless possibilities. In fact, 1.6 billion people worldwide depend on forests for their livelihoods.

Forests are home to 80% of the terrestrial biodiversity. They play a key role in our battle against climate change, releasing oxygen into the atmosphere while storing carbon dioxide.

Yet, forests worldwide are suffering. Each year 36 million acres of natural forests are lost due to human activities. Deforestation and degradation of forests are key reasons behind climate change, accounting for about 20% of global carbon dioxide (CO2) emissions. Protection of forests has now become essential for the future of human beings on this planet.

Deforestation and degradation of forest land is a matter of serious concern in Bangladesh. From about 20 percent of coverage in pre-independence years, the country's forest cover has now dwindled to an

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alarmingly low level. Nationally, the MDG Country Analysis revealed that Bangladesh has made good achievements in terms of social forestry.

However, natural forest ecosystems are struggling for survival as these have been subject to continuous deforestation and encroachments. Forests of the entire Bhawal-Modhupur tracts, in the Chittagong Hill Tracts and Sylhet and the Sundarbans have shrunk considerably.

The remaining forestlands face degradation, and this also includes the reserve forests of Bangladesh. With cultivation of cash crops, hills are systematically denuded of forest cover. Deforestation in hilly areas and conversion of forests into farmland have led to soil erosion, landslides, and congestion of rivers.

Loss of forests has also caused loss of biodiversity and contributed to deterioration of air quality. Degradation of the Sunderbans is increasing the vulnerability of the coastal areas to tropical storms, cyclones, and tidal surges.

The United Nations Development Programme (UNDP) in Bangladesh has worked with the government over the last 40 years as a trusted partner in its development endeavours. Environmental protection is core to UNDP's development mandate. As an organisation, UNDP views the protection of the natural environment as fundamental to human development.

Indeed, UNDP Bangladesh played an important role in the policy and



programmes that are securing improved environmental and natural resource management, protection of biodiversity, energy conservation and promotion of inclusive approaches that link poverty alleviation with environmental conservation. UNDP's various successful past projects have demonstrated powerfully that improved environments have a great beneficial effect on other development dimensions.

The very real challenge of climate change is affecting various areas of development in Bangladesh. At the same time, it is well known that Bangladesh has shown strong leadership on the international stage in calling for a global response to climate

change that is just and fair.

Bangladesh's pioneering and comprehensive disaster risk reduction and management system stands ready to deal with the threat of climate change. UNDP is also working with the Ministry of Environment and Forest to support communities' plant mangrove forests along exposed coastal areas which create a protective buffer to coastal erosion and storms and can even help to reverse the effect of sea level rise by trapping high rates of sediment in their root structure.

As part of this initiative, fruit and timber trees are being planted alongside the mangrove plantations, which can be harvested by the participating community members. Still, this is only

part of the response. To adequately deal with the climate change challenge, we also need to seek ways that capture and promote the best in ideas, technologies and opportunities to put Bangladesh on a development path that is clean, green and sustainable.

Bangladesh can and should, take advantage of such opportunities. UNDP, together with other partners in the development community, is well equipped and committed to support such new initiatives. It is important that the government plays a lead role in coordinating partners and integrating the process of climate change mitigation and adaptation into its effort for sustainable development, thus guarding the country against the very real danger of major climate change setbacks.

UNDP's present portfolio also seeks to push the climate change mitigation and low emission green development agenda forward. For example, UNDP is supporting the Government of Bangladesh in Improving the Kiln Efficiency in the Brick Making Industry (IKEBMI project) by demonstrating the environmental and dollar value in energy efficiency and forestry and natural resource conservation.

Although fuel wood use at brick kilns is prohibited in Bangladesh, fuelwood constitutes one-third of the total fuel consumed in the brick making industry, significantly causing deforestation and land degradation. There are about 8,000 traditional brick kilns in Bangladesh that use fuel wood, which are causing significant deforestation and CO2 emissions.

Through this five-year UNDP-supported project, the government is introducing a new technology to the country's brick making industry to reduce environmental pollution and to make energy consumption more efficient.

The project's overall aim is to

replace the 150-year-old energy-intensive conventional brick making technology with an energy-efficient and smokeless technology named Hybrid-Hoffman Kiln.

Successful implementation of this project is estimated to result in substantive reduction of annual greenhouse gas emissions equivalent to emissions of more than 230,000 passenger vehicles or carbon sequestered by more than 250,000 acres of pine or fir forests. With the successful up-scaling of the project and hopefully the conversion of 8,000 traditional brick fields into energy efficiency kilns in the near future, the opportunity of CO2 mitigation is multiple times larger.

At the United Nations Climate Change Conference held in Copenhagen (COP15) in December 2009, the massive travel and accommodation arrangement of the dignitaries of the conference caused estimated emissions of around 40,000 tons of CO2 in the atmosphere.

The Danish Government offset COP15's carbon footprint by investing in emissions reduction in Bangladesh's brick industry. Under the arrangement, Emission Reduction certificates worth USD 1 million were provided, which will reduce CO2 emission by 50,000 tons per year. Implementing this type of carbon trading mechanism is also a long-term goal of the UNDP supported brick kiln project in Bangladesh.

Addressing the challenges of climate change requires significant efforts and there is no time to lose. The key is to turn around the climate change threat into an opportunity, and usher into a new era of "green" development in this country.

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Forest: The one and only address of inhabitable world

DR. MD. MIZANUR RAHMAN

FOREST ecosystem provides benefits that support the livelihoods of countless human beings. Forests provide a number of components to the broad range of ecological services such as, regulation of rainfall and hydrological system; maintenance of soil quality, control of soil erosion, modulating climate; and being the habitat of biodiversity. Forests form the basis of different industries e.g. timber, wood processing, paper, rubber, paints, resin, gum, honey, food, medicines, building material, fodder, game, tourism, etc. Forests are home to millions of people all around the world and they are dependent on the forests for their survival.

Every nation has strong cultural and spiritual attachments to forests. Aesthetics and beauty are the important components of forest services. These services are connected and sustained through the integrity of the ecosystems. It is quite impossible to compare the importance of the various services provided by forests as there is no universally accepted common metric that can be used in such measurement.

Global warming: Climate change and forests are interlinked. The increased destruction of the rainforest forming a precious cooling band around the Earth's equator, is recognised as one of the main causes of climate change. Forests trap and store carbon dioxide, playing a major role in mitigating climate change. On the flip side of the coin, forests become the sources of the greenhouse gas, carbon dioxide when destroyed or over-harvested and burned. Forests, if not harmed ensure that they are enabling to continue to produce the benefits; to mitigate the effects of a changing climate; and to compensate for fossil fuel emissions through carbon storage; and to enhance ecosystem health, sustainability, and resilience.

Forests reduce greenhouse gas emissions to combat global warming. 20% of global greenhouse gas emissions result from deforestation and degradation of forest, more than all the world's cars, trucks, ships and planes combined. Fossil fuels release carbon dioxide into the atmosphere contributing to global warming and climate change. Forest alleviates this change by converting carbon dioxide to carbon during photosynthesis. The world's forests contain about 125 percent of the carbon found in the atmosphere. This carbon is stored in the form of wood and vegetation through "carbon sequestration".

Trees possess about 20 percent carbon by weight and biomass of forest acts as a "carbon sink." The soil organic matter produced by the decomposition of dead plant material also acts as a carbon store. Consequently forests store enormous amount of carbon: in

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Sunderbans, a unique example of co-occurrence of different ecosystems.

total, the world's forests and forest soils currently store more than one trillion tons of carbon, twice the amount found floating free in the atmosphere, according to FAO studies.

The atmospheric carbon dioxide concentration in the pre-industrial era was 280 ppm. Right now the level has risen to 375 ppm, a 30% increase. It is predicted that the level will be 450 ppm in 2050 resulting in 1.8-3°C increase in temperature eventually. Therefore, global warming will produce a sharp upswing followed by a deep plunge into a glacial period several thousands years from now. A myriad of potential impacts such as increased cyclone intensity; melting of polar icebergs and glaciers; increased salinity and changes in oceanic currents sea level rise and inundation of low lying cities like Venice, Cairo, New Orleans, Lagos, Amsterdam, etc.; coral bleaching and mortality of coral reef; colonization of invasive species and species migration; changes in ecosystem; mass extinction; ozone layer depletion; water shortage; and spreading of diseases -- is predicted.

Biodiversity loss: The oceanic food chains may be disrupted. The Amazonian rainforests will be converted into Savanna. The unique

biodiversity of various mega hotspots is being lost on a scale that is quite unprecedented. Even though tropical rainforests occupy just 6 percent of the surface area of the Earth, about 80-90 percent of the entire species of the world exist here. Due to massive deforestation, about 50 to 100 species of animals are being lost each day. Rapid deforestation in the Himalayas leads to the extinction of hundreds of plants and dozens of birds and animal species. It is predicted that 366 plant species as well as three dozen species of birds, fish and mammals could become extinct in this region. The future of Himalayas looks very bleak.

Riparian habitat complexity: Water temperature regulates the physiology and ecology of different like littoral and lentic biota. It influences the distribution, behaviour and survival of biota. Riparian deforestation causes the increase of water temperature, thermocline deepening, habitat complexity and insulation, and decreases littoral shading. This deforestation also increases the down-slope salinity and nitrate contamination in surface runoff. The riparian deforestation causes habitat destruction of wildlife refuges especially of amphibians and reptiles.

Changes in climatic pattern: Plant absorbs water from soil through roots and releases it into the atmosphere during transpiration. This released water then forms clouds and rains. African Congo basin deforestation has claimed an enormous toll through the ages in environmental damage. Deforestation of Amazonian rainforests may change the climatic pattern of the world. The deforestation of Amazon is rising very sharply. Even Bolivian Amazon's deforestation rate in Santa Cruz is alarming. 20% of the planet's oxygen is produced by rainforests.

Soil properties: Deforestation exposes the forest soil to the sun, making it very dry and eventually, infertile, due to volatile nutrients such as nitrogen being lost. The rainfall washes away the rest of the nutrients, which flow with the rainwater into waterways. The soil stands totally devoid of essential nutrients. Large tracts of land will be rendered permanently impoverished due to soil erosion. Deforestation causes drought and desertification. Deforestation disrupts the regulation of the flow of water. It also increases salinity in the soil. It alters the microclimate of a place thus affecting the habitats of endemic species. Tree roots bind

the underlying bedrock. Deforestation increases the risk of landslide.

Invasive species: Both climate change and invasive species are highly correlated. They are the extraordinary ecological challenges to the world today. Global warming has a profound influence on species' geographical ranges. Climate change alters destination habitat and increases vulnerability to invasion because of resource scarcity and increased competition among native fauna and flora. Changes in precipitation, nitrogen deposition and temperature will have tremendous impact on the geographic ranges of many species. Increased temperature will allow the spread northward of some species currently restricted in their northern ranges. Stressed ecosystems facilitate the successful invasion of non-native plants.

Cyclone: Deforestation exacerbates cyclonic impacts. Forests act as a buffer between the cyclone and the habitat area. The impacts of the cyclone Nargis was devastating due to deforestation of the mangroves of the Irrawaddy Delta, Myanmar. Hurricane Mitch devastated the Central American countries of Nicaragua and Honduras. The destructions were so severe due to deforestation. Amazon basin level drops in Peru due to hurricanes and deforestation. The Caribbean will be vulnerable to increased hurricane activity if deforestation of the Amazon rainforest is not stopped. The massive deforestation of the Sunderbans will expose the entire southern part of Bangladesh to frequent cyclones.

How to combat the climate change impacts?

- Carbon balancing**
- > Initiating tree-planting projects specifically designated for carbon-emissions mitigation
- > Replacing construction materials such as plastics, aluminum or cement with wood
- > Initiating carbon finance
- > Using more wood in long-lasting products to keep trapped carbon out of the atmosphere for longer periods of time
- > Substituting fossil fuels with biofuels
- > Implementing the Climate Convention and the Kyoto Protocol in the forest industry
- > Calculating the greenhouse gas balance of the forests, on the basis of the amount of deforestation and reforestation and providing the data for the inventory of greenhouse gases
- Silvicultural management**
- > Devising the basic requirements for near-natural silviculture
- > Monitoring the impact of climate change on forests and devising appropriate strategies
- > Dealing with biotic damage in forests like infestation of wood-boring beetles and forest fires
- > Coordinating national and interna-

tional forest policy

- > Improving land use pattern and protecting forest lands
- > Involving indigenous peoples and traditional communities in conservation programme
- > Introducing afforestation and reforestation with introducing pioneer and early successional species
- > Facilitating natural regeneration in degraded forests
- > Leaving denuded forest lands untouched for 20 years to promote natural succession
- > Stopping further clear felling and illegal logging
- > Protecting natural regenerations (seedling, sapling and juvenile trees) from cutting
- > Taking effective actions against encroachers and land grabbers
- > Increasing basic research on the impact of forest degradation
- > Alleviating poverty in the adjacent areas of forests
- > Emphasizing on community based conservation
- > Establishing more protected areas
- > Searching for alternative fuel sources in the forest and adjacent areas
- > Taking care of secondary and successional forests

Riparian forest management

- > Declaring riparian vegetation as the refuge ecosystem for plant and wildlife
- > Prohibiting clearance of wood and shrubs within 25 m on both sides of any waterway
- > Preserving not only the river front, interior and riparian forest edge but also parts of the adjacent upland forest
- > Undertaking afforestation on the open sand dunes by the plant species which have 'prop roots' to anchor itself in the loose sand
- > Maintaining at least two canopy layers (bimodal or reverse J-shaped diameter distribution)
- > Maintaining at least two main canopy tree species suited to the sites
- > Undertaking passive management to develop tree size canopy structure and decadence
- > Planting large diameter trees with strong root systems to provide critical structure
- Coastal forest management**
- > Designing and establishing sea-level/climate modelling network
- > Integrating coastal and marine management
- > Conducting coastal vulnerability and risk assessment
- > Initiating community based coastal forestation
- > Introducing afforestation and reforestation by salt tolerant species
- Controlling invasive species**
- > Introducing desirable trees to shade out regeneration of invasive species
- > Digging out and burning the thickets of the invasive species
- > Using microbial and other biological agents to control invasion

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