

Bringing back the green cover

Sal can be effectively regenerated naturally from shoots growing from stumps after a clearcut harvest. With natural regeneration, there is a higher probability of developing mixed stands. In the core and buffer zones of each forest natural regeneration should be facilitated to maintain the ecological balance and to ensure continuous forest coverage.

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BAKGLADESH has lost her last stadium size forest - this may be a newspaper headline after few decades. The forces of overpopulation are invading the natural habitats, hastening the demise of the forests. During the past 40 years, close to 70 percent of the forest coverage has been cut down -- more than in the whole of previous 250 years since the British colonization began. Due to high population density and sharply skewed distribution of land, the forest resources are overexploited.

Per capita forestland in the country is around 0.02 ha and the existing natural forests are decreasing at a rate varying from 2.1% /yr to 3.3% /yr. The recurrent anthropogenic disturbances in the natural forests have rendered the system inhospitable for the regeneration and growth of wild plant associates, causing a net loss of biodiversity. Like many others, the writer fears that an additional 20 percent of the trees will be lost over the next decade. If that happens, the forest ecology will begin to simply unravel.

In our country, the events set in motion by logging are almost always more destructive than the logging itself. The land sharks follow the roads deep into previously impenetrable forest, and then destroy tracts to make it look as if they own them. Encroachment, illegal logging, regeneration destruction, looping, litter sweeping, animal grazing, shifting cultivation, agroforestation, soil disturbances, over-exploitation of natural resources, people living inside the forests and the recreational activities like picnic are the main causes of massive erosion of the Sal forests. The hydro-electricity project, ethnic conflict, encroachment, jhum cultivation, land sliding, hill cutting and illegal logging are the main factors involved in the degradation of hill forests. Poverty, profit-making, over-exploitation of forest products,

illegal logging, natural disaster, salinity and sedimentation cause deforestation of coastal forests.

Different studies show that all our natural forests have become critically fragmented to the point where they are considered unlikely to maintain minimum level of green biomass. On the other hand, the cities of Bangladesh have been becoming urban mayhem and losing living ambience. The single storied residential buildings with open green spaces are fast disappearing and multistoried buildings are replacing them. With disappearing plant habitats Bangladesh is losing its ecological balance. Ensuring the long term healthy environment by using green development is a crying need for the future generations.

At least 25% forest cover is essential for maintaining biodiversity and ensuring ecological goods and services, such as clean air, clean water, carbon sequestration, and flood control. An increase in forest cover can happen through afforestation, reforestation and natural expansion of forests. Afforestation occurs when trees are planted on land that was not previously forested. Natural expansion of forests refers to an expansion of forest through natural succession onto previously non-forested lands, usually abandoned agricultural land. Reforestation occurs when trees are planted or regenerated on the sites that were previously forested. Where part of a forest is cut down but replanted (reforestation), or where the forest grows back on its own within a relatively short period (natural regeneration), there is no change in forest area. Green Bangladesh can be brought back in the following ways:

Natural succession in the denuded core zone: Following the human disturbances pioneer species like Sal, Sundori and Garjans will become established in the open areas under full sunlight. Eventually, in the absence of further disturbance, these pioneer species will be

replaced by seral species that will occupy the site through a series of successional stages, leading ultimately to a plant community comprised of climax species. The denuded areas belonging to core zone of our natural forests can be reforested through natural succession. However, during the early successional stage, the natural regeneration requires protection from further anthropogenic disturbances.

Natural regeneration in the natural habitat: Natural regeneration is an effective means of regenerating the forest when conditions are right. It is usually favourable for the trees suited to the site. Effective natural regeneration from seed depends on the seed productivity and dispersal. Alternatively, some species like Sal can regenerate from suckers and shoots. Sal can be effectively regenerated naturally from shoots growing from stumps after a clearcut harvest. With natural regeneration, there is a higher probability of developing mixed stands. This may occur even when the original stand is pure. In the core and buffer zones of each forest natural regeneration should be facilitated to maintain the ecological balance and to ensure continuous forest coverage.

Direct (artificial) seeding in the peripheral zone: Direct (artificial) seeding is usually carried out from the ground on sites that have been prepared for seed germination. While it is a more expensive procedure than natural regeneration, there is a greater likelihood of establishing the desired species. Large volumes of seed (5-10 seeds for each seedling) are required for successful regeneration. Direct seeding can be applied in the buffer zone and totally degraded forest areas.

Gap filling by rare species: In forests where small-scale disturbances exist, stand dynamics are controlled by the creation of gaps due to single or multiple overstorey-tree mortality. Sometimes openings are created due to illegal logging in small scale. Newly established seedlings or advance regeneration of rare or endangered species should be recruited in these openings. This will protect the rare and very rare species from extinction as well.

Woodlot plantation in the encroached forest lands: Plantation of hardwood trees to harvest for profits and environmental carbon offset is called woodlot plantation. Invasive species



Sal forest with mixed plantation.

should be avoided for woodlot plantation as they disrupt native biodiversity. Teak, Mahogany, Jackfruit, Sissoo, Rain tree, Koro, Rajkoro and Chapalish can be planted in the encroached areas under the forest restoration programme.

Riparian plantation: Riparian forests are typically composed of overstorey, understorey and macrophyte species. Deep-rooted species (overstorey) are more capable of reinforcing riverbanks against mass failure than shallow rooted groundcover. Trees should be planted around potential slump-block failure planes. However, understorey and groundcover species provide mid- and upper-bank sections with greater protection from scour. Lower bank sections that tend to remain wet throughout the year are best protected by macrophyte species where they can be established. Hogla, Hanthol and Golpata can be used for the reparation plantation.

Building greenbelt in the coastal areas: The coastal areas of Bangladesh are prone to severe damage from cyclones. It has been proved that dense forest cover along the coastline is an effective protec-

tion against the impacts of cyclones. Coconut, betel nut, palm, babla and jhau tree can be planted in the entire coastal area to build up a green belt.

Embankment, roadside, and railside plantations: Rail-side land, sides of national highways and feeder roads, and river embankments should be planted native timbering and fuel wood tree species. The roadside trees are pruned twice a year and the branches are used for firewood.

Homestead and institution plantations: Old and unproductive trees in the homesteads should be replaced by new and high yielding multipurpose, fruit trees and medicinal plants. The open spaces of schools, colleges, mosques, temples, other institutions, local government offices and cyclone shelters need plantations by multipurpose trees.

Sand dune plantation: Accredited foreshore and offshore islands need to be planted for dune stabilising. Screw pine (Pandanus) can grow on sand dune and has thick 'prop roots' to anchor itself in the loose sand. Keora, Kakra, Gewa, Hargoza, Khalisha and Bain are the suit-

able species for such type of plantation as they have fast growing roots.

Tanguya plantation: It consists of growing annual agricultural crops along with forest trees during the early establishment of forest plantations on the hills. This is a method of establishing agricultural crops in temporary combination with forestation. Agricultural cropping ends with the casting of dense lateral shade or closing of the forest canopy. This system can be applied for the afforestation and reforestation programme in the hilly areas.

Urban forestation: Urban forests play an important role in maintaining congenial human habitat in many ways: they filter air, water, and sunlight, and provide shelter and recreational area for people. They are critical in cooling the urban heat island in peak summer months. In a wider sense it may include any kind of woody plant vegetation growing in and around human settlements.

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Car dependency: Contemplating way out

There are resistance to reforms, in part due to various interests that benefit directly from automobile dependency, and in part because many consumers have little experience with a balanced transportation system and are skeptical that they could benefit from lesser automobile use.

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OVER the course of the 20th century, the automobile rapidly developed from an expensive toy for the rich into the de facto standard for passenger transport. The development of the automobile built upon the transport revolution started by railways, and like the railways, it introduced sweeping changes in infrastructure, manufacturing and legislation. The wide reaching effects of automobiles on everyday life, however, have been a subject of much controversy. Proponents on one end of the spectrum claim the car is a marvel of technology that has brought about unprecedented prosperity, while opponents on the other end claim it leads to a mode of urban and suburban planning that discourages walking and human interaction, uses large amounts of polluting fuel, etc. In this assignment, I try to find the impacts of car dependency and the solutions.

Peter Newman and Kenworthy (1989, 1999; Kenworthy et al 1999) defined car dependency as building a city with the assumption and priorities that most people will drive. They suggested that this was reflected in densities under 30 people per ha. An outline of some key drivers in city development and in particular how they relate to the increase or decrease in urban density rather than values and transport infrastructure that was dominated by roads. Very low densities mean little option for walking, biking or public transport due to the distances involved unless a very long time is taken. However density is not everything. In very dense cities it is still possible to be car dependent unless other options are available. Walking will always be easier but buses can be as slow as in sprawling suburbs, especially in the third world, as buses get stuck in traffic and again only cars offer a solution in a realistic timeframe. Car dependency can thus be generalised as where the average journey to work is achievable in 30 minutes only by car.

Impacts of automobile dependency

The impacts of car dependency can be categorised as: Economic changes (a. Industry restructuring, b. Infrastructure); Cultural changes (a. Changes to urban society, b. Advent of suburban society, c.

Car culture, d. Social status); Environmental changes; Increased traffic congestion and crash damages; Increased road and parking expenditures.

Economic changes

a. Industry restructuring: The development of the automobile has caused changes in city planning. Huge industries devoted only to the automobile were created. Before the internal-combustion engine was developed, gasoline was a waste product, often discarded. Once the automobile became commonplace, the production of gasoline blossomed into a matter of such importance that national governments took action to secure the steady flow of oil. The steel industry was already established, but the coming of the automobile created huge amounts of business for it. As automobiles began to travel at higher and higher speeds, the sign industry began building larger and larger signs and billboards to draw attention of drivers. Some urban areas remain pedestrian friendly with many stores, cafes and other attractions, yet still have a great deal of motor traffic passing through, and hence billboards atop many business buildings.

b. Infrastructure: Aside from the industries, one of the most visible effects the automobile has had on the world is the huge increase in the amount of surfaced roads. For example, between 1921 and 1941, the United States spent \$40 billion on roads, increasing the amount of surfaced road from 387,000 miles (619,000 kilometres) to over 1,000,000 miles (1.6 million kilometres) which doesn't even take into account road widening. However, with increased road-building came loss of habitat for wildlife on a massive scale. Loss of rural areas and agricultural land to pavement has also been extensive. The quality of roads was also improved.

Cultural Changes: The automobile made regular medium-distance travel more convenient and affordable, also in areas without railways. Because automobiles did not require rest, and were faster than horse-drawn conveyances, people were routinely able to travel farther than in earlier times. Historically, most people never travelled more than a few dozen kilometres from their birthplace in their entire lives; they advent of the automobile

began the transformation of society in such a way that those who had never travelled that distance were only a tiny minority.

a. Changes to urban society: Beginning in the 1940's, most urban environments in United States lost their streetcars, cable cars, and other forms of light rail to be replaced by diesel-burning motor coaches or buses. Many of these have never returned, though some urban communities eventually installed subways. Another change brought about by the automobile is that modern urban pedestrians must be more alert than their ancestors. In the past, a pedestrian had not to worry about relatively slow-moving streetcars, or other obstacles of travel. With the proliferation of the automobile, a pedestrian has to worry about being hit by automobiles at high speeds and breathing noxious exhaust fumes.

b. Advent of suburban society: Because of automobile, the outward growth of cities accelerated, and the development of suburbs in automobile intensive cultures was intensified. Until the advent of the automobile, factory workers lived either close to the factory or in high density communities further away, connected to the factory by streetcar or rail. The automobile and the federal subsidies for roads and suburban development that supported car culture allowed people to live in low density communities far from the city centre and integrated city neighbourhoods. The developing suburbs created some local jobs, due to single use zoning. Hence, residents commuted longer distances to work each day as the suburb expanded. Shopping centres were built in or near suburbs to save residents trips to the city. Finally, as the service economy gained importance, business parks appeared, allowing suburb dwellers to work in the suburbs. The automobile caused the decentralisation of cities, segregating land use and ethnicities, while increasing the footprint of the residents.

c. Car culture: The car had a significant effect on the culture of the middle class. Automobiles were incorporated into all parts of life from music to books to movies. Between 1905 to 1908, more than 120 songs were written in which the automobile was the subject. Books centered on motor boys who liberated themselves from the average, normal, middle class life, to travel and seek adventure in the exotic. Car ownership came to be associated with independence, freedom and increased status. At the end of the 19th century, Americans put a great deal of emphasis on personal freedom and individual mobility. The automobile encompassed both of these ideals.

d. Social status: The automobile signifies much more than simply a mode of



Streets are no more as free to accommodate more cars.

transportation. Henri Lefebvre called the automobile "the epitome of possessions". In the early years, when the first automobiles were imported to America from France for the bourgeois and elite, the car served as a mark of distinction above all others. The automobile rapidly became a symbol of social status, and in some cases, a fashion item. The automobile, more than almost any other possession, allowed people to flaunt wealth.

Environmental changes: Automobiles are a major source of the carbon dioxide that is causing global climate change. The total number of cars and light vehicles (excluding heavy trucks) on the planet was about 600 million in 2006. This is increasing at the rate of about 50 million a year. The average car or light vehicle emits approximately 0.2 kilograms of carbon dioxide per kilometre -- in terms of volume, that is about 1 cubic meter of carbon dioxide for every 10 kilometres travelled. For a large part of its development, no consideration was given to concerns such as air pollution, destruction caused by road-building, and the massively increased consumption of limited natural resources, most notably petroleum and land. Certain of these issues are now starting to be addressed in some parts of the world, particularly in parts of the European Union, where there is much scope for tackling these problems. For example almost all cities in Europe were developed during the era when pedestrians and mass transit were more common, before the rise of the automobile and are ideal for bicycles and other human powered transport.

Increased traffic congestion and crash damages: Increased automobile

travel tends to increase total congestion delays, crashes and environmental impacts such as air pollution and imperious surface coverages. Although some impacts may be relatively low per kilometre in automobile dependent areas (for example, traffic congestion is often high in older, multi-mode thoroughfares and per kilometre crash rates are often high in developing countries where automobile ownership is low) total costs per capita tend to be higher due to high levels of vehicle use. These costs can reduce regional productivity. Traffic congestion reduces the efficiency of business and services that involve local travel. Crash damage costs are borne directly through increased insurance fees and lost worker productivity and indirectly through taxes to cover injuries and disabilities.

Increased road and parking expenditures: Automobile dependency increases expenditures on roads, traffic services and parking facilities. Annual per capita road expenditures average \$264 in automobile dependent U.S. cities, \$135 in less automobile dependent European cities and only \$88 in the least automobile dependent Asian cities, representing savings in both absolute terms and as a portion of Gross Regional Product.

Strategies to reduce automobile dependency

A number of strategies can help reduce automobile dependency and create more balanced and efficient transportation systems.

Increased transportation choices: An efficient transportation market requires that consumers have viable transport choices, including good walking and

cycling conditions and a range of transit services. High quality transit can provide an effective alternative to automobile travel and serves as a catalyst for more efficient land use. To be effective transit service must be competitive with automobiles in terms of speed, convenience and comfort.

Transportation demand management: Transportation demand management includes a variety of strategies to encourage more efficient transportation patterns. These include strategies to encourage use of alternative modes, such as transit, ridesharing, bicycling and walking strategies to discourage driving.

Land use management: Increased residential and employment densities, mixed land use and jobs-housing balance can reduce total vehicle travel by improving access. Even in suburban conditions, locating services such as retail shops and schools closer to residential areas, and accommodating walking and bicycle travel can reduce automobile trips.

There are currently political and institutional resistance to such reforms, in part due to various interests that benefit directly from automobile dependency, and in part because many consumers have little experience with a balanced transportation system and are skeptical that they could benefit from lesser automobile use. These reforms may become more acceptable as they are better known, and as consumers realise the diminishing benefits of increased driving. A number of European and Asian cities are making progress developing more balanced transportation systems and appear to be benefiting economically as a result.

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