

# Urban forestry: Imperative for life in city

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OVER the last three decades, serious and growing concerns regarding the status and use of natural forests have emerged. Successful reservations, which create a variety of protected areas, commonly prohibit commercial timber harvesting, and often strictly limit or prohibit other non-commercial forest uses for both timber and non-timber purposes. Reservations for national parks, wildlife habitats, biodiversity, critical watersheds and other special purposes, remove forests from timber production and thus affect sustainable timber supply. Adequate human and financial resources and support are required, particularly where forests have traditionally been a source of livelihood for local families and communities.

In the urban areas, reservation of forests stands essential and urgent mostly even for minimum healthy survival of urban populations. The present article deals with some major points of urban forests on socio-scientific approaches.

### What is urban forestry

There is no commonly accepted definition for urban forestry, a working definition may be "an integrated approach to the planting, care and management of trees and forests in and around the city to secure multiple environmental and social benefits for urban dwellers". Urban forestry is a specialised branch which may be termed as arboriculture. It comprises natural woodlands within the urbanised zone and in an adjacent suburban or peri-urban areas, parks and reserves, and trees along highways and roads, in yards and homegardens, around public buildings, and in playgrounds and other public places. Urban forestry thus merges arboriculture, ornamental horticulture and forest management and its scope includes activities in the city centre as well as to those in peri-urban areas.

Many different environments and areas, such as parks, streets, residential places, industrial and commercial zones, parking lots, community centres like schools, colleges, mosques, temples, churches, rest houses, memorial places etc. are included in urban forestry. Society of America Foresters in 1972 states that urban forestry is cultivation and management of trees for their present and potential contribution to the physiological, sociological and economical well-being of urban society.

If we consider the forests and urban people in the region of Asia-Pacific then it is found that only 34 percent people live in the cities, but this is changing rapidly. By 2025, some 55 percent of the region's people will be urban residents. The People's Republic of China's urban population is expected to increase from 30 percent to 55 percent; India's from 27 percent to 45 percent; Indonesia's from 35 to 61 percent; and Pakistan's from 35 to 43 percent. By 2015, Asia will have 17 of the world's 27 megacities (with populations of 10 million or more). Today, over 60 percent of urban people live in towns and cities of one million or fewer people; only 15 percent live in large ones. In the region of Asia-Pacific, the urban forestry development varies greatly,

particularly in the developing countries. In Australia and New Zealand there is a considerable area under urban reserves. In very densely populated (and less developed) cities such as Jakarta, Old Delhi, Colombo and Dhaka, the area under urban forestry is less than in Kuala Lumpur, Singapore, Sydney, New Delhi, Melbourne, Auckland and Wellington. The poor cities in the region are generally far below the international minimum standard (9 square meters of green space per city dweller) set by the World Health Organization (WHO).

### Management of urban forests

Urban forestry is for the well being of urban people and urban environment where man is under mechanised life style and soil is under cement cover. For the reason, urban forest is different from the natural forest. Urban forests need multi-management approach. It thus necessitates appropriate planning before embarking upon an urban forestry programme. The goals based on the local needs have to be determined in the planting phase. A management plan should be developed by involving all the concerned agencies and owners of the lands. It has to be designed in such a way that it could serve to sustain physiological health for human perception



as well as to maintain wholesome environment. The primary objective of urban forest management is to maintain the health and vigour of the vegetation without undue interference of the city dwellers. Apart from others, urban forest management has three major needs. These are tree planting, tree maintenance and removal.

Tree planting: Tree planting is the primary need in the management of urban forest. The factors like selection of sites, species composition, spacing of trees, design of planting are the principal ones for forest planting programme. Single species may cause problem of mortality due to insect attack and disease infection. Monoculture also gives a monotonous scenery. Thus diversification of species is needed. As a

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general rule, the species composition promotes species diversification by restricting a species to no more than 15 percent of the population. Diversification is thus needed where several species of different shapes, colour, ages, and sizes are used.

Tree maintenance: One of the primary concerns of urban forest management is to maintain the health, vigour and compatibility of vegetation with the environment. It involves all practices to control growth, damage and insect and diseases from the time of planting to removal.

The objectives of growth control are to retard or redirect and accelerate growth of trees. The first objective may be achieved by pruning and application of growth retardant chemicals. The second one can be met by fertilization, irrigation and control of competing vegetation. A good knowledge of growth requirement and cultural problem including environmental factors is of utmost importance. Disease control is thus complicated requiring professional expertise for its effective treatment.

forestry development in urban areas (it is generally under the jurisdiction of municipal governments and often carried out by landscape designers and horticulturists). Even where national forest administrations are responsible for peri-urban and urban forest resources, co-ordination with the municipality tends to be weak. Urban forestry also suffers from a lack of political and financial support.

Trees tend to rank especially low among the priorities of many developing countries where burgeoning populations demand attention to more pressing needs for shelter, food and sanitation. The result is that green spaces and trees disappear, and future options for developing these are cut off. Another constraint facing urban forestry development is high price of land in urban areas. This leads to conservation of forest lands in suburban or peri-urban areas and pressure on green areas in the urban centres.

While the constraints to urban forestry are numerous, there are still ample opportunities for forestry development in cities. Growing

and most important urban forestry activities in both Singapore and Hong Kong. Wood/timber production was also a driving force behind afforestation efforts in Hong Kong. As the economies of all three cities have developed, street tree planting and urban green space for recreation have increased in importance.

Singapore: Singapore was covered with tropical rainforest when the British arrived in 1819, but subsequent intensive agricultural schemes, coupled with logging and fuel wood collection led to significant deforestation and forest degradation. By 1884, only 7 percent of the island was forested. To provide for watershed protection and wood production needs, in the late 1880s, forest reserves were established and catchment areas of new reservoirs were put under protection. The centre of the island remains forested today, protected as nature reserves and catchment area managed by the public utilities. Although planting of ornamental trees in Singapore dates back to the middle of the last century (with the active involvement of the Singapore Botanical Garden), the most active programmes in street tree planting and urban greening have taken place since the 1970s. Rapid population growth from the time of ending World War II to the mid-1960s, led to urban congestion and housing shortage. The low rate of population increase after the mid-1960s, and rising affluence, were important factors underlying the successful planning and revitalisation of the urban environment in Singapore.

Hong Kong: Hong Kong had little natural forest cover when the British took possession in 1841. At that time, Hong Kong was described as "a barren rock" of grass covered hills with sparse woodland cover in the valleys and small patches of protected groves near the villages. Major reforestation programmes were carried out from the late 1800s to the early 1900s, and again starting in the early 1950s, following extensive deforestation during World War II. These reforestation programmes had a dual purpose: watershed protection and wood/timber production. Government plantations and village woodlots were established to provide fuel wood, poles and timber for rapidly growing population. In the late 1960s, these programmes were scaled down due to a decrease in the demand for fuel wood and increased availability of alternative fuels.

Greening efforts picked up again in the 1970s with establishment of country parks and, later, with various tree planning initiatives. The extremely rapid growth of Hong Kong's population and dense infrastructure development without planning for green space earlier now limits the scope for street tree planting and urban green space in the older urban areas of Hong Kong. Nevertheless, particularly outside the urban core, various public, private and citizen led efforts are being made in tree planting along streets and roads and in parks and

other public areas.

Kuala Lumpur: The pattern of urban forestry development was different in Kuala Lumpur, where the major period of population growth occurred much later than in Singapore and Hong Kong. The major period of growth of Kuala Lumpur has been the last few decades, in particular since 1974 when the city became the capital of Malaysia. Kuala Lumpur lies in a region of rich tropical forest. These are still significant areas of forest within the city limits and extensive forest reserves in the peri-urban area provide for watershed protection, recreation and nature conservation functions. Pressure on the urban and peri-urban forest for provision of wood products is relatively low. Demand for fuel wood is small because the average income level is relatively high and people have access to alternative household fuels. These are also ample supplies of timber for construction and other needs from other sources in the country. Similar to Singapore, Kuala Lumpur has put great emphasis on beautification of the city, both for the benefit of urban dwellers and to attract businesses.

### Urban forestry and Bangladesh

Urban forestry had been started in this part of the world now called Bangladesh too. The century and decades old trees in Dhaka and Chittagong cities are reminiscences of the past efforts. Unfortunately, most of these trees were cut down in the name of development activities. However during last two decades, there have been large scale plantation of trees in the country including along the roads and highways, railways and other places in the cities. Commendable approaches were establishment of botanical gardens at Mirpur and Suhrawardi Uddyan at the old race course ground in Dhaka city. Unfortunately, the approaches for establishment of urban forestry in Suhrawardi Uddyan has been seriously neglected by the emotional cause. The establishment of Balda Garden by a private endeavour is a highly praise-worthy effort. The zoos in Dhaka and Chittagong cities have also been covered with trees. All these may be termed as urban forests. The importance of urban forestry for maintaining environment is enormous

The urban environment is complex. It is characterized by predominance of concrete structures, and also stone, asphalt and metal. These materials absorb and radiate heat easily. The materials have also high reflective power for light and sound. On the top of these, transportation and industrial activities in the cities produce a great amount of heat and dust. The air thus becomes filled with carbon dioxide, carbon monoxide, sulphur dioxide and many other pollutants. The sunlight is often partially covered by haze, smoke or even fog induced by emissions.

Pollution is increasing in the



cities of Bangladesh in spite of government regulations to control it. Urban forestry may be practiced to redress the adverse effects of pollution, and thus ameliorate the environment. Trees have proven beneficial by fixing some toxic substances and cleansing atmosphere. The leaves of trees have large surface area that act as filters for dust through sedimentation. Particles are usually deposited on the upper surface of the leaves. The rougher and smaller the size of the dust particles the more chances it has being retained in the rougher and broader surface of leaves and other parts of a plant.

Trees can remove gas from air. It is an important sink for nitrogen dioxide, sulphur dioxide, hydrogen fluoride, chlorine and ozone. Trees can also reduce fumes and unpleasant odour either by absorption of gaseous pollutants or by masking them with pleasing foliage or floral fragrance. Carbon monoxide and nitric oxide cannot be effectively eliminated by the plants. There is, however, a limit to the concentration of pollutants a plant can absorb and still function properly.

Noise is an acoustic energy which can be attenuated (i.e. reduced in intensity) through absorption by the leaves, branches and twigs of trees, and thus reduce the vibration, reflectability and resonance of sound produced in immediate environment. Porous materials like leaves can absorb up to 95 per cent of the sound energy. A well managed urban forest can thus attenuate sound and reduce sound pollution significantly.

The major elements of climate are air temperature, humidity and air movement. Human comfort is directly related to these elements. Vegetation can contribute to provide some comfort by amelioration of the climate. During the sunny days, trees intercept solar radiation, and through evapotranspiration they lower the temperature. It is found that a medium sized isolated tree can transpire about 400 litres of water per day. This may be compared to five average room air conditioners each with a capacity of 2,500 kcal/hr running 20 hours a day. This is why trees are called nature's air conditioners.

The humidity is usually higher under a forest canopy and evaporation rate is slower, because trees intercept and filter solar radiation, inhibit wind flow, transpire water, and reduce evaporation of soil moisture.

Trees also intercept precipitation and slow down its descent to the soil surface through stem flow. This increases infiltration and decreases run-off and soil erosion. Their high rate of transpiration depends on water availability for aquifer recharge in areas where natural underground aquifers are the main source of water. For all these, a well designed and managed forest with appropriate tree species needs to be established in and around the city areas.

### Recommendations

The future of urban forestry in Bangladesh depends to a large extent on how well urban planning can stay ahead of urban growth, and more importantly, the extent to which plans can be effectively implemented. Key issues will be whether urban forest and trees are considered important when urban infrastructure is first being developed. Effective implementation of the urban plans will depend upon coordination between the various entities involved and the means to address conflicts between competing demands on forests and tree resources. For the betterment of the urban forestry in future following recommendations could be adapted.

# Establishment of environmental law on urbanisation and urban forestry.

# Identification of proper places for urban forest in towns and cities; and identification of proper plant species to be maintained on scientific grounds and adaptability.

# Regular and seasonal study-arrangement on the questions of plant-animal associations and their status of urban benefits to the inhabitants.

# Establishment of synchronisation among trophic relations in the urban forest ecosystems (specially the animal distribution and succession).

# Increase of awareness in the students of schools, colleges and similar institutions on priority basis on the subject of urban forestry.

# Assignment should be given to scientists to assess importance of urban forestry on the life-style of the urban people.

# Encouragement on the individual care of plant-animal culture in the urban areas on the basis of minimum scientific knowledge.

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# The right to water

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IN Bangladesh, like in all other developing countries, lots of people, particularly those among the poorest, do not have access to safe drinking water and basic sanitation. But access to water is a basic human right. So, the burden of provision must be shared fairly among people, regions and even countries, through the principle of "solidarity"--actions based on people's belief that they have a duty to help their fellow human beings. Solidarity mechanisms involve all players in society including governments, local authorities, civil society groups, private companies and multilateral institutions. Many successful solidarity mechanisms already exist in Europe.

The right to water has been recognised by the United Nations (UN). General Comment (GC) No. 15 is the first official UN document that fleshes out in detail the content of the right to water. It clearly states that the right to water emanates from and is indispensable for an adequate standard of living as it is one of the most fundamental conditions for survival.

"The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is necessary to prevent death from dehydration, reduce the risk of water related disease and provide for consumption, cooking, personal and domestic hygienic requirements."

Sufficient: An adequate quantity must be available in accordance with international guidelines. This ordinarily means 40-50 litres per day and an absolute minimum of 20 litres.

Safe and acceptable: Water must be safe for each use. Water for drinking must meet a very high

standard. Water should be of an acceptable colour, odour and taste.

Physically accessible: Water must be within safe physical reach, either within the house or near the household.

Affordable: Water should be affordable and must not affect a person's ability to buy other essential goods.

Due to limits of available resources, immediate realisation of this human right may be constrained. So progressive realisation of the right to water is called for.

While full realisation may take time, certain steps must be undertaken immediately. GC15 stipulates that these steps must be deliberate, concrete and targeted towards the full realisation of the right to water. Particular focus should be put on nine core obligations.

- To ensure access to the minimum essential amount of water, that is sufficient and safe for personal and domestic use to prevent disease;
- To ensure the right of access to water and water facilities and services on a non-discriminatory basis, especially for disadvantaged or marginalised groups;
- To ensure physical access to water facilities services that provide sufficient, safe and regular water, that have a sufficient number of water outlets to avoid prohibitive waiting times, and that are at a reasonable distance from the household;
- To ensure personal security is not threatened when having to physically access water;
- To ensure equitable distribution of all available water facilities and services;
- To adopt and implement a national water strategy and plan of action addressing the whole population; the strategy and plan of action should be devised, and periodically reviewed, on the basis of a participatory and transparent process; it should include methods, such as right to

the rights to water and sanitation are interdependent. The right to water, particularly the aspect of water quality, cannot be realised without adequate sanitation for all. Conversely, to ensure hygiene and adequate sanitation, each person should have access to a minimal amount of water on a regular basis. Sanitation and water supply are integrally linked, and therefore an integral

water indicators and benchmarks, by which progress can be closely monitored; the process by which the strategy and plan of action is devised, as well as their content, shall give

particular attention to all disadvantaged or marginalised groups;

- To monitor the extent of the realisation, or the non-realisation, of the right to water;



- To adopt relatively low-cost targeted water programmes to protect vulnerable and marginalised groups;
- To take measures to prevent, treat and control diseases linked to water, in particular, ensuring access to adequate sanitation.

The human right to water also explicitly includes the right to sanitation. The GC15 states that "State parties have an obligation to progressively extend safe sanitation services, particularly to rural and deprived urban areas, taking into account the needs of women and children".

The UN Sub-Commission on the Promotion and Protection of the Human Rights has provided further guidance on the right to sanitation. As set out in the Final Report of the Sub-Commission's Rapporteur on this topic, the human right to sanitation requires that States ensure to each person, access to safe, accessible, acceptable and affordable sanitation facilities in or near to their homes and public institutions (including educational institutions, hospitals and places of work).

- It includes the following features:
- Availability: sufficient sanitation facilities;
  - Quality: sanitation facilities should be designed in a manner such that they minimise health hazards, are conducive to hygiene, and are consistent with the privacy and dignity of individuals, taking into account cultural preferences of users and the special requirements of women and children;
  - Accessibility, which comprises: (1) Physical accessibility--sanitation facilities should be



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within safe physical reach for all sections of the population, in the immediate vicinity of each household, educational institution and workplace, in a safe location; (2) Affordability (or Economic Accessibility)--sanitation facilities must be affordable; (3) Non-Discrimination--sanitation facilities and services should be accessible to all without discrimination; (4) Information accessibility--accessibility includes the right to seek, receive and impart information regarding sanitation issues.

Fulfillment of the right relies on the creation of opportunities for active community participation. In order for the right to be fulfilled, particularly in developing countries like ours with limited resources, it may be necessary to rely on low-cost sanitation systems rather than expensive sewage networks. The design and maintenance of such systems require input and active participation by communities.

The right to sanitation implicitly

includes the right to hygiene education, since the transmission of disease may occur even where sufficient water and sanitation facilities exist due to unsafe behaviour. Hygiene education is also necessary in some cases in order to stimulate greater demand for sanitation facilities. Gender and age concerns are paramount in the design of sanitation facilities--one of the primary sources of insecurity for women and girls is the lack of available sanitation facilities in safe locations close to the home or in school.

Finally, the rights to water and sanitation are interdependent. The right to water, particularly the aspect of water quality, cannot be realised without adequate sanitation for all. Conversely, to ensure hygiene and adequate sanitation, each person should have access to a minimal amount of water on a regular basis. Sanitation and water supply are integrally linked, and therefore an integral part of the human right to water.

### International Obligation and Solidarity Duty (by Sub Commission Special Rapporteur)

- States should refrain, and should ensure that private persons and organisations under their jurisdiction refrain from any action that would interfere with the right to water and sanitation of persons in other countries.
- Developed countries should provide, depending on available resources, sufficient financial and technical assistance to supplement the resources of developing countries, with a view to ensuring that everyone has at least basic access to water and sanitation service as quickly as possible. Each developed country should at least commit to allocate a portion of its official development assistance, proportional to its Gross National Product, to fulfil the objectives set out in the Millennium

Declaration and the Johannesburg Plan of Implementation adopted by the World Summit on Sustainable Development with regard to access to water and sanitation.

- Bilateral and multilateral assistance to the water and sanitation sector should be focused on countries unable to realise essential aspects of the right to water and sanitation for their people, provided in a manner that does not interfere with the realisation of any human right and focused on projects that can have tangible benefits for those without basic access to water and sanitation.

- International organisations, including the UN specialised agencies, trade and financial institutions, and the States that are members of these organisations, should ensure that the right to water and sanitation is respected in their policies and operations. States should take the right to water and sanitation into account in formulating and implementing international agreements.

Although national and local governments are responsible for developing water and sanitation systems, international solidarity actions should support and add to these initiatives. International solidarity is particularly important for the poor countries like Bangladesh.

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