

# Greenery in Urban Environments: A Study of Mysore City in India

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## ABSTRACT

**P**reservation of nature is an integral part of urban planning. Well maintained greenery contributes immensely to social, economic, educational and ecological value, provides space for recreation and personal revitalization, attracts and retains investment for development, reduces noise and sultriness in summer, and enhances property value.

Mysore is popularly known as a 'city of palaces and gardens'. The buildings in the city are architecturally beautiful and are endowed with well-maintained parks, open spaces, boulevards, and fountains. However, urban expansion is expected to continue unabated. One of the adverse effects of rapid and relative unplanned growth is heavy encroachment leading to the problem of shrinking green space and Mysore City Corporation resources are inadequate to fully meet the maintenance and expansion needs of the city's green spaces.

Mysore has a total of 316 big and small parks in addition to a large number of institutional open spaces and avenue plantations. The main objective of cultivation and management of trees is their contribution to the physical, social and economic well being of the urban community. The city has a few lakes/tanks that add to the beauty and environmental value of the city. These lakes are popular picnic spots and are frequented by nature lovers as they attract a number of migratory birds. Mysore also has a theme park – Chamundi Hill - that is a unique landmark of the city and is a rich heritage site with religious, tourism and ecological importance.

The measures suggested by this paper include active involvement of the private sector and NGOs, improved maintenance of green spaces, planting and caring for avenue flowering trees, preservation of agricultural zones, identification of tank/lake-specific activities and their optimal utilization, use of recycled sewage water for irrigation of parks, and protection of natural valleys and drains to increase the capacity of lakes during monsoon.

**Key Words:** *planning and management, Comprehensive Development Plan, shrinking green spaces, and preservation of agricultural zones.*

## 1. INTRODUCTION

Building and preserving parks and green areas are a part of ancient Indian culture. They continue to be life sustaining even today. Well maintained lush gardens, parks and trees constitute a necessary input for civilization. Natural and cultivated greenery preserves and improves the overall urban environment. In addition, it offers entertainment and relaxation for people. Since greenery is such a visible part of the landscape, care must be taken to ensure proper growth conditions. This paper highlights the vital role played by natural and manmade greenery like parks, residential gardens, institutional gardens, boulevard/avenue plantations, bonsai gardens, zoological gardens, green belts, water bodies, and thus the significance of planning and management of green areas. It aims to assess the present state of green spaces in the city of Mysore and evaluate its potential for sustainable development including rainwater conservation.

## 2. BACKGROUND OF THE STUDY AREA

Mysore is situated in the south central part of the Indian Deccan Plateau at 12° 18' North latitude and 76° 12' East longitude at a height of 770 meters above MSL, this picturesque city is known for its pleasant weather. The gradient within the city ranges from 1 to 100 m to 1 to 50 m. Its situation amidst beautiful sylvan surroundings with majestic Chamundi Hill (1085 m) as a backdrop is majestic indeed. The general slope of the city is towards the South. The physical geography of the city has been very helpful in extending drainage and sewerage facilities all over city.

Mysore is a planned city and successive rulers as well as the present Government of Mysore State since 1947 have tried to keep it so. The city owes much to *Maharaja* (King) Krishnaraja Wodeyar IV (1884-1940), one of the most celebrated rulers of the princely States of India and his two *Diwans* (Ministers), Mirza Ismail (1883-1959) and Sir M. Vishveshwaraya (1860-1962), for its well laid roads, parks and gardens, lakes and water fronts, fairs and festivals, and above all for the great educational and cultural institutions that abound in Mysore. The city meets not only its residential needs but also houses the necessary public buildings, Government offices, accommodates amenities like parks, open spaces for sports and recreations, commercial areas and provides land for the construction of religious and

charitable institutions. Lung space also has been equally emphasized as playgrounds for children and sports grounds for youth and students. Parks used to be proportionate to the size of each extension. Vast areas of land were used for constructing palaces, mansions, as well as municipal and government buildings in a grand style, with beautiful architectural features invariably in sync with one another (Devanath 2005).

Equally significant was the interest and realization of the need of adequate vacant land around these buildings, not only as a lung space, but also to provide beautiful environmental surroundings like gardens, parks and wooded greenery, which enhanced the overall beauty and charm of not only each construction but also the city as a whole (Ibid 2005).

Despite being located not too far away from the equator and in the interior of the Peninsula, Mysore has a salubrious climate. Neither too hot nor too cold, it is always pleasant, although some climatic changes have become evident as forest areas have shrunk. The city lies in the rain shadow region of the Western Ghats and, therefore, receives no more than 850 mm rainfall per annum mainly from April to November. Even in the rainy season, relative humidity does not exceed 60 percent. April and May are the hottest months. Being located on an undulating plateau, the city and its surroundings have large tracts of the land suitable for forests and pastures. Its forests are described as deciduous (they shed leaves in summer).

### 2.1 Population Growth

Mysore city has been growing steadily and is expected to have a population of more than one million before the first decade of the twenty first century ends (Table 1). The City Development Plan for Mysore has estimated the population to be 0.89 million for 2006 and projected population in 2031 can be as low as 1.7 million (growing at the historic rate of 2.5%) or as high as 3.0 million (growing at the rate of 2.5) (Shenoy 2007).

Increase in population and unbridled urbanization of Mysore city has eaten away green spaces as the city continues to expand horizontally. In response, the Mysore Urban Development Authority (MUDA) has proposed new residential layouts on the periphery of the city.

**Table 1:** Mysore: Growth of Population - 1901-2001

Year	Population	Variation	%
1901	68,111	- 5,937	-8.00
1911	71,306	3,195	4.69
1921	83,951	12,645	17.73
1931	107,142	23,191	27.62
1941	150,540	43,398	40.51
1951	244,323	93,883	62.30
1961	253,865	9,542	3.90
1971	335,685	81,820	40.10
1981	479,081	143,396	40.00
1991	653,345	174,264	36.30
2001	785,800	132,455	20.30

Source: Census of India 2001, Series-30, Karnataka, Bangalore

## 2.2 Land use pattern

Mysore is a booming city. As elsewhere, fast growth is accompanied by decrease in the quality of life for many people. The city is getting over crowded and there is a growing tendency to violate prescribed norms in the land use change. The objectives of land use planning may in brief be summarized as: improving physical environment, strengthening the

urban economy, maintaining ecological balance and fostering social values.

The Comprehensive Development Plan (CDP) for Mysore City has the Local Planning Area (LPA) of 233.13 km<sup>2</sup> and conurbation area of 92.21km<sup>2</sup>. The present Mysore - Nanjangud Local Planning Area covers 495.32 km<sup>2</sup> of which the Mysore city conurbation covers 156.69 km<sup>2</sup>, the proposed

**Table 2:** Land use in Mysore 1995 and proposed land use analysis for 2011 AD

No	Land Use	Area (ha)		% Developed area	
		1995	2011	1995	2011
1	Residential	3075.30	6097.87	40.40	43.45
2	Commercial	182.23	344.07	2.41	2.45
3	Industrial	1021.01	1855.05	13.40	13.22
5	Public/ Govt. Offices	856.45	1180.78	11.32	8.41
6	i. Parks and Open Spaces	415.77	1055.05	5.49	7.52
	ii. Chamundi Hill	-	1634.82	-	-
7	Traffic and transportation	1530.73	2380.56	20.22	16.96
8	Water Bodies	182.68	178.95	2.41	1.27
9	Public Utility	37.26	43.35	0.49	0.31
10	Agricultural purposes	285.34	898.99	3.73	6.41
11	<b>Total Area</b>	<b>7568.77</b>	<b>15,669.49</b>	<b>100.00</b>	<b>100.00</b>

Source: Mysore Urban Development Authority, Mysore, 1998.

Nanjangud town conurbation, 9.2 km<sup>2</sup> and green belt, 329.43 km<sup>2</sup> (including the villages and the areas reserved for their future expansions). The ratio of conurbation area and green belt works is 1:5 (Figure 1). A land use survey was conducted by the Town Planning Department in 1995. Table 1 gives the results of this survey and Table 2 gives the land use pattern proposed in the Master Plan 2011. Public and semi-public uses cover an area of 865.45 hectares constituting 11.32 per cent of the total area.

New developments have been along the Mysore-Bangalore road, Mysore-Nanjangud Road, Mysore-Mangalore Road, Mysore-Manadavadi Road and Mysore-Krishnaraja Sagar Road. A number of large residential colonies have come up in these areas. While planning for new residential layouts, existing

green spaces may be removed and give way to public and semi-public buildings or houses.

The area of Mysore city according to the MUDA has increased from 7,569 hectares in 1995 to 9,221 hectares in 2001 representing a growth of 22 percent. This expansion is expected to continue unabated and the total land areas of Mysore are expected to encompass to 15,669 hectares by 2011. An analysis of the land use pattern of Mysore shows a tilt towards residential areas, which cover a greater portion of the city, and this is expected to increase in the next few years. At present, residential areas account for 2,850 hectares and this will increase by 114 per cent, which will cover about 6,098 hectares by 2011 (Figure 2).

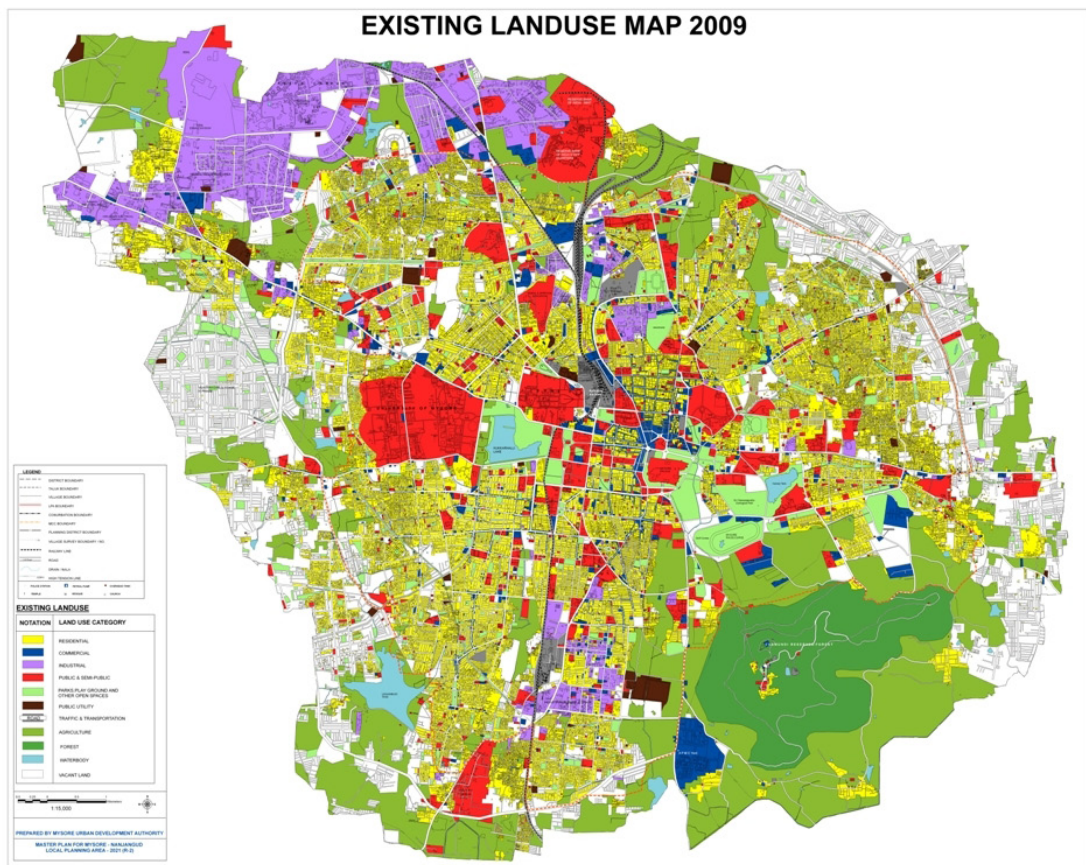


Figure 1:  
Mysore city land use land cover map



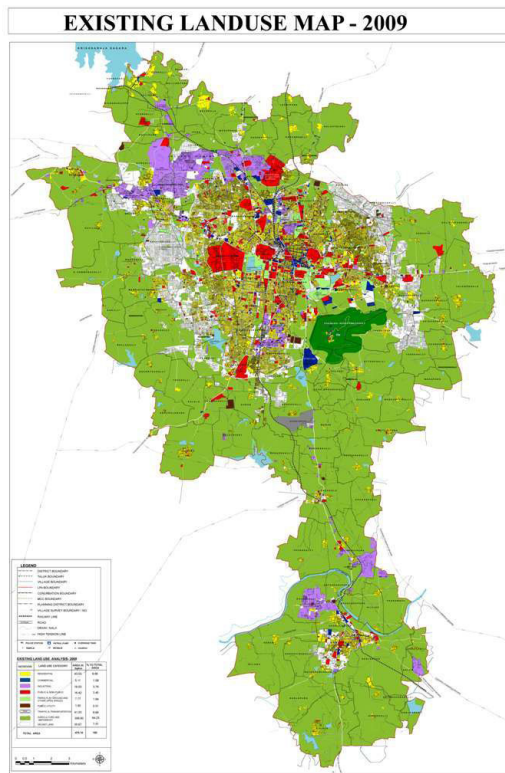


Figure 2:  
Mysore region land use land cover map

### 3. PRESENT SCENARIO OF GREEN AREAS IN MYSORE

Aerial photographs and satellite imagery of the city show green and wide natural valleys running through the various parts of the city. On the east Chamundi Hill and its associated ecosystem offer yet another green belt. These valleys are essential for effective drainage and prevention of urban floods and are already quite green. These are the areas that need to be declared green areas and protected from adverse urban impact as they provide a high level of ecological and economic potential. It is important to adopt a network approach to conservation of green areas so that contiguous stretches can be formed and their ecological benefits are enhanced. It is possible to derive synergistic benefits from conserving and managing the natural valleys as green areas and make Mysore a sustainable city rather than an urban jungle.

A considerable portion of the 'Royal City' of Mysore is constituted by parks and gardens intercepted by

beautiful sylvan avenues. But because of a lack of funds and of various constraints being faced by the Mysore City Corporation (MCC) and due to human resource limitations at the Department of Horticulture, many parks are in a state of neglect. One of the adverse effects of the rapid and relatively unplanned growth of the so-called 'Garden City' is the heavy encroachment on gardens, parks, playgrounds and other organized open spaces and lakes/tanks. This has resulted in the problem of shrinking green areas. A majority of parks are in a state of long neglect and decay. Parks and green areas face the threat of encroachments by way of accommodation for other types of land uses.

#### 3.1 Parks

Mysore city has a total of 316 big and small parks. The MCC has various problems regarding their upkeep including labor and water shortage. Despite sinking of bore wells, it has become difficult to get water for conservation and there is opposition from the public to make use of Cauvery river water. While the MCC and the MUDA have earmarked sufficient areas for parks there has been very little follow up action.

The MCC is maintaining all these parks, except four, which are maintained by associations of localities. People should let their representatives know that public parks are a priority.

Out of the 316 parks in the city, 120 are maintained by the MCC while the remaining are just fenced off areas, having a lush growth of parthenium and other weeds. Only 80 parks have irrigation facilities and hence, they are moderately maintained. MUDA is yet to hand over 90 parks to the MCC for development and maintenance. There are 300 parks in the city belonging to the MCC and the MUDA. Another 16 parks have come under the control of the Horticulture Department. Hoteliers and business establishments have come forward to construct compound walls around parks. The city has numerous parks that are just as old as heritage buildings (MSV 2006).

There are several parks in the city each in the range of 4 to 5 hectares of area. Not many out of the 316 parks in the city measure less than half a hectare.

Few parks are mentioned here. The Cheluvamba Park in Yadavagiri is the largest among the well-maintained parks, measuring 5 hectares and situated



Figure 3:  
Parks in residential area

opposite Akashavani (All India Radio) on Krishnaraja Sagar road. The entire park area is illuminated and a number of seasonal flowering plants are grown. This park houses a small green house featuring various indoor plant species. Towards the north end corner, the park has a playing area for kids. The Curzon Park has three wings (on both sides of Kote Anjayenaswamy Temple and opposite Opera Talkies) spread over 2.5 hectares of land. A Japanese style arch bridge has been constructed over this huge drain. Special steel grills erected all round the park are an added attraction. The entrance of this park has an impressive arch made of stone. This park has separate walkways for casual strollers and joggers. The Mysore city has a science park, one of the most rare of its kind, situated in the premises of the Regional Institute of Education. The city has a park exclusively for the visually impaired located opposite to Curzon Park. The theme of this park is 'touch, feel and understand'. With the aid of background music, the blind can visualize nature. A unique herbal park has been developed in this city. It is a pride of Sri

Cauvery Composite Pre-University College, situated in Kuvempu Nagar. There are more than 30 herbal plants. There is another herbal park very near the Saraswathipuram swimming pool; this is attached to the College of Indian Medicine and is a part of their curricular experience.

### 3.2 Bonsai Garden

In Mysore, a Bonsai Garden called Kishkindha Vana is located within the Sri Ganapathi Sachidananda Ashram. In a highly urbanized setting, it may sometimes be very difficult to show a tree that grows in deep jungles. Although one has access to dedicated magazines and television channels, nothing can replace direct experience. In such circumstances, the Bonsai concept can be of great help. Bonsai technique allows us to have a miniature forest. Just as well-maintained zoos can be great assets to a country, miniature gardens too can be of immense value.





Figure 4:  
Bonsai Garden - Sri Ganapathi Sachidananda Ashram

### 3.3 Avenue Plantations

Avenue trees are found along major roadsides in the city. Apart from avenue trees, coconut trees are prominent within residential slots in Saraswathipuram, V. V. Mohalla, Jayalakshmiapuram, and Vidyananyapuram.

### 3.4 Institutional Greenery

Mysore is known for many institutional and public/civic buildings. These are important and major public institutions that provide large scale lung space with greenery in the city. Particular mention may be made of the University of Mysore, which occupies about 300 hectares including the Kukkarahalli tank, and has well maintained orchards, gardens and woodlands. Nazarbad has a zoological garden. Other major institutions like Central Food and Technological Research Institute, Regional Institute

of Education, All India Institute of Speech and Hearing, Telecommunication Department, Defense Establishments and a number of schools and colleges including industrial zones within the city provide open spaces with greenery.

Urban forestry is a specialized type of forestry that has the objective of cultivation and management of trees for their actual and potential contribution to the physical, social and economic wellbeing of the urban community. It embraces a multi-dimensional system that includes maintenance of water sheds, water bodies, biological control of weeds and pests, human and animal habitats, outdoor recreation facilities, landscape design, recycling of municipal wastes, tree care in general and future production of wood and fiber as raw material. The role of tree plantations in upgrading the usability of wastewater cannot be minimized and has many bio-technological interfaces.





Figure 5:  
Avenue plantations



Figure 6:  
Institutional Green in Infosys – I.T. Park



Figure 7:  
Institutional Green – Regional Institute of Education

### 3.5 Green Belt

A green belt is defined as areas for the management of forests and other plant communities in and near cities for the primary purpose of providing open space, recreational opportunities and other amenities including the prevention of environmental

degradation. A green belt is for the purpose of protecting and preserving the flora, fauna and scenic beauty and as a visual buffer against the often-ungainly industrial or utility areas and sprawl, and as a means to replenish oxygen – the mitigation of carbon dioxide and carbon monoxide poisoning. The MUDA has reserved 356 sq. km as a green





Figure 8:  
Residential Green

belt between the conurbation and the LPA boundary with a view to provide better climatic conditions. Arrangements have to be made to monitor and increase green activities in the green belt area.

### 3.6 Lakes/tanks and their surrounding regions

In Mysore, some lakes have disappeared and on them now stand towering symbols of urbanization, irresponsibility and lack of love for nature or its beauty. To cite an example, the famous Doddakere Lake is now the venue of Dasara Exhibition and football grounds. The Jeevanna Rayanakatte near City Railway Station and Subbarayanakere on the Chamaraja Double Road have both dried up and have become parks. There are many lakes small and big which have met their end due to lack of will and greed for urban land on the part of authorities and citizens. At present, there are about five major and twenty smaller water bodies greatly contributing to the city's ecological balance.

They assist in ground water recharging, support livelihood by way of fishing and grazing, and quench the thirst of the bovine population and other types of live stock as well as supply the water needs of wild birds and animals.

- **Kukkarahalli Lake** is very popular in the city and has a catchment area of more than 175 hectares. The water body spreads over 104 hectares and has a depth of nearly eight meters. De-silting, fencing around its boundary, laying of the path for walkers, and a flower gardening require constant attention.
- **Karanji Lake**, including its surrounding area, is nearly 42 hectares. It is located near the foot of Chamundi Hills and next to the Mysore Zoo and is very popular among tourists. The Karanji Lake now includes an aviary for chirping birds. The birds are within handshaking distance from visitors. Boating in the lake has started. The running track around the lake, a butterfly park and an aviary walk boasting of nearly sixty-five species of birds has now become very popular among the locals too.



Figure 9:  
View of Kukkarahalli Lake within the University Campus  
– back drop of Chamundi Hill

- **Dalvoy Lake** occupies an area of about 22 hectares. The quantity of water in the lake has drastically decreased due to inadequate rain and the construction of residential buildings around it, blocking the flow of rainwater into the lake. The topography has become adversely affected.

Plans are afoot to restore the major lakes of Mysore under the Jawaharlal Nehru National Urban Renewal Mission.

### 3.7 Theme Park - Chamundi Hill

Chamundi Hill is a unique landmark of Mysore City and is considered to be one of the city's rich heritage sites having religious, tourist and ecological importance. It acts as a catchment for the more than ten surrounding lakes. It has a rich biodiversity with 450 plant species of which about 50 are medicinal plants, 145 species of birds and 60 species of butterflies. There are remarkable improvements in the raising of various plant species in the western parts of the hill, thanks to the efforts of the Department of Forests. Rejuvenated shrub jungle dominates its profile, but frequent fires are impeding its growth and may leave the hills barren in due course.

Out of about 2000 hectares only about 613 hectares is under the Forest Department as "Reserve Forest", 404 hectares are private land and about 995 hectares are termed as public and other government lands. The success of the tree cover program is not as good as expected due to shallow soil, poor nutrient status, erratic rainfall and heavy

biotic pressure. However, *honge*, *dhupa*, *godda*, *basavanapada*, *ala*, and *neem* have been successful and still exist here and are growing even today. Now, contour trenching has been adopted and eucalyptus seedlings in large numbers on degraded soils have been raised and are surprisingly surviving today even between rocks. Now with the thrust given to plant only the native species, planting is restricted to species like *honge*, *ala*, *goni*, *hunse*, *tapasi*, *bevu*, *hale*, *nelli*, *bela* etc., and the success rate is good. It is therefore necessary now to remove all eucalyptus trees to make way for indigenous species, coming up naturally or planted. Extensive planting by digging contour trenches and large pits was possible due to the Norwegian Project (1997-2000) at a cost of Rs. 3.8 million (Kushalappa 2005). The entire boundary is now fenced with chain-link mesh that prevents villagers and their cattle getting into the forest through unauthorized entries.

## 4. PRIVATE PUBLIC PARTICIPATION

The onus of maintaining the parks was too burdensome for the MCC and hence, Private Public Participation (PPP) was implemented; however, this has not been very successful. In Mysore, the only park maintained by a private organization is Vishwamanava Park, under the care of Raman Board and in addition, there are also several other parks unofficially maintained by the local residents.

The MUDA, after preparing a layout and fencing off a park area, simply hands it over to the MCC for development and maintenance. Actually, it is the responsibility of the MUDA (as the Development Authority) to develop the park in MUDA layouts and then hand them over to the MCC for maintenance. But, under the present circumstances, the MCC is overburdened and owing to scarcity of funds, is unable to undertake development works. The MCC will chalk out a program to persevere and develop 316 parks in the city with the help of private sponsors (The Hindu 2003).

## 5. PLANNING AND DEVELOPMENT OF GREENERY

Every aspect of planning and development should be infused with a concern for imaginative and effective maintenance of open spaces and flora and fauna thereon.

Mysore is poised to launch its new Master Plan aimed at beautifying the city. It is appropriately called '*Sundara Mysooru*' (beautiful Mysore) Plan. Rs. 3000 million would come from the Jawaharlal Nehru National Urban Renewal Mission of the Central government, Rs. 500 million from the Central Ministry of Tourism and Rs. 3000 million from the Asian Development Bank and World Bank. Work has also started on drawing up an urban forestry strategy and an information pamphlet on this strategy by the Forest Department and NGOs is being circulated.

However, the MCC has decided to develop parks in phases. It has invited tenders worth Rs. 17.5 millions to develop over 60 parks in the first phase. Lawns, mounds, water cascades and jogging tracts will be developed; ornamental plants and shade-giving trees will be raised. However, alarmed by the bad shape of various parks, which is marring the image of the city, concerned commoners, industrialists, philanthropists, experts in various fields and officials of the MCC are now planning to rejuvenate and maintain over 200 parks; a manifestation of civic consciousness.

To promote a green environment in a residential or industrial area, the first step is to control development or construction activities. Typically, it is known as "The Scenic Zone" in city planning law and it is playing an important role in the preservation of urban green through its proper enforcement. The other is to preserve green areas in their existing condition and wherever possible to enrich and diversify them.

The water-front design should be functional, maintainable, cost effective, visually pleasing and environmentally sound and also enable people to relax there. Including a wooded buffer strip and aquascaping in the shoreline design is one way. An instance of this can be found in the case of Lingambudhi Tank to the South-West of Mysore City. A buffer strip improves and maintains the water quality by providing a filter area to trap sediments and excess nutrients, reduces maintenance time and cost, preserves natural beauty of a setting, screens undesirable views and frames good views and provides erosion control and shoreline stabilization. An aquascaping plan around the visitors parking area can include short native woody plants, moisture loving forest perennials, ornamental native aquatic plants to create a natural shoreline and improve water quality by reducing erosion and filtering runoff water.

## 6. SUGGESTIONS AND CONCLUSIONS

In reviewing the approved Comprehensive Development Plan, the following policy measures are suggested in the context of green areas in Mysore. To protect and preserve the beauty of the city, it is necessary to constitute an Urban Arts Commission. Further, the flowering trees should be planted suitably along the roads in the city. The private sector and the NGOs may also be included for this effort. In the future, greater effort will be needed towards greening Mysore and the urban fringe and a more careful consideration about the suitability of trees is required.

The Horticulture Department is the best agency to maintain public parks as it has the requisite knowledge, expertise and manpower. Some basic aspects like the species of trees and plants to be chosen to plant in a park of a particular locality, taking into consideration the overall aspects of that area, the kind of landscape required, availability of water, and the continuous maintenance of vegetation are some of the finer aspects requiring expertise and knowledge. The Department has a long experience in this regard.

Protecting the natural valleys and topographical drain-ways to facilitate the filling up of lakes during monsoon; development of waterfront areas with activities which would enable people to come and relax there; and identification of lake-specific activities, leaving the lakes for optimum use. Dredging and desilting of water bodies suitably in dry season and using this silt for upgrading agricultural land is a priority area of action.

The use of recycled sewage water for irrigation of parks is important. The sewage water that generally goes to waste and occasionally gets released into some of the parks in the city could be treated and reused for irrigation, instead of wasting Cauvery water, which should be conserved and used exclusively for domestic consumption.

Some of the areas in the urban pockets, for instance within the conurbation limits, are quite fertile and high yielding coconut groves. They should be maintained as agricultural zones. No land shall be alienated for any non-agricultural purposes in the case of land coming within 500 m of the agricultural zone from Chamundi Hills boundary according to Zoning



Regulations, .. The long pending proposal for Nehru Loka Theme Park at the foot of the Chamundi hills should be taken up soon.

The temple authorities are already collecting the entry fee at the top but it could be enhanced and collected at the lower entry point of the Hill itself and shared with the Forest Department to plough back for Hill development. The temple also should be able to part with their revenue, at least about 5 per cent for the Hill maintenance. After all, Goddess Chamundi also needs a proper environment around her to stay and bless her devotees.

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