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Emerald Article: Planning and management of parks and green areas: The case of Bangalore metropolitan area

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Planning and management of parks and green areas

The case of Bangalore metropolitan area

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Abstract

Purpose – The purpose of this paper is to discuss how to plan and provide for people's relaxation and engagement, cognitive and aesthetic needs. Symbolic of this is the green city image, which is obtained through planning and management of parks and green areas.

Design/methodology/approach – The approach here is to note that Bangalore has gained all-round importance as an administrative, trading and industrial center and a location for premier educational institutions along with large IT and BT industries. Also, it is a center of strategic importance, due to a concentration of defense establishments. The study observes the abundance of parks and avenue trees and green areas along with green median and traffic islands all through in the city, which provide shade and meet the purely ecological and aesthetic needs.

Findings – The study reveals the beneficial impact of green areas on the microclimate of the city, which also serve as outdoor recreation areas to the city people. The parks and green areas need serious rejuvenation as centers of social activity and they should cater to peoples' active and passive recreation needs and abate the stress of urban living.

Practical implications – The implication of this study is the manifest importance of different local government authorities, institutional arrangements, NGOs with expertise to maintain parks and green areas in and around the Bangalore Metropolitan Area and of growing more trees and developing greeneries within the city of Bangalore.

Originality/value – This paper's value is to promote awareness regarding the complexities and importance of parks and green areas and their vulnerabilities and management.

Keywords India, Gardens, Leisure activities, Urban areas, Community planning

Paper type Research paper

Introduction

Parks and green areas are essential to the environmental and social well being of citizens and also to further humanize the city. They are also important as pleasant visual elements in the townscape. Even a single, mature and healthy tree can soften the uncompromising angular and grotesque shapes of modern buildings. High density of population living and working on land which is itself steadily becoming inadequate, embodying a declining and degrading environment will undoubtedly require soothing and relieving through high quality outdoor experiences in a residential green space. Unfortunately municipal resources will find it rather difficult to respond adequately. The issues and problems related to these aspects of planning in urban areas are well known to all experienced town planners, architects and landscape designers of the city, despite an inadequacy of quantification and documentation specific to this field. This

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study has been undertaken to highlight the importance of planning and management of parks, and green areas in Bangalore Metropolitan Area (BMA).

Definition of parks and green areas

A park can be defined as "an enclosure in town with ornamentally laid out gardens and walkways for public recreation". Widely dispersed urban parks, fountains and greenbelts consisting of densely raised vegetation serve as passive recreation centers particularly for old people and children. Besides parks, there are other areas, which contribute to the greenery and openness of the city. Avenue Plantations are trees found along roadsides. Its main function is to provide a canopy and thereby increasing the proportion of greenery and reducing heat island effects. The Green Belt is that which encircles the built-up area constituting the city. This green belt is designed to restrict and resist the urban encroachment on rural lands and forests and to preserve agriculture, urban forest fringes and water bodies. Green belt is defined as an open land used as a buffer zone wedged into urbanized areas. It can be used as forest, as a visual buffer against the often-ungainly industrial or utility areas and as a means to replenish oxygen – mitigation of carbon dioxide and carbon monoxide poisoning and providing scope for minor fauna.

Functions of parks and green areas

Parks and green areas have ecological, recreational and aesthetic roles in a city. They provide access to natural habitats, enrich subsoil water, immunize against and avert damage to the built form, and, in general, keep all of us healthy and cheerful (Watson, 2001, pp. 7.4-7.1). The value of green areas for human beings is not restricted to merely recreational functions. They also contribute substantially towards improving the general standards and patterns of life in a city. This contribution ranges from tangibly clean and healthful endowments to insulation against noise pollution and environmental damage (Gowda and Sridhara, 1999, p. 8). Green space facilities offer variously grounds for camping, spontaneous games, integrated sports facilities and swimming pools (in case of active amusement), educative and stimulating flower gardens with fountains and cascades as well as zoos in the vicinity. These facilities are contributing to the quality of environment and work as a bulwark against urban monotony. Private or residential gardens in homestead backyards are a traditional feature of human society. These supplement the role played by public gardens and parks. Private residential gardens have the potential to provoke individual initiative and genius in the choice and arrangement of plants contributing to the overall health of the environment and also development of ecological consciousness and sensitivity. Often these serve as pace setters and models for emulation.

Background of the study area

Bangalore is located at the centre of the south Indian peninsula, equidistant from both the eastern and the western coasts with an elevation of about 931 meters above the mean sea level with latitude 12° 58′ North and longitude 73° 36′ East. The city is well known for its equable and salubrious climate and has often been referred to as the "air-conditioned" city of South India.

The main features of the climate of Bangalore are an agreeable range of temperature, from 33°C in April to 14°C in January, and the two rainy seasons June to

September and October to November, coming one after the other but with opposite wind regimes, corresponding to the southwest and northeast monsoons respectively. Of the annual rainfall of 844 mm, a little more than half occurs during the southwest monsoon period and about a quarter in the northeast monsoon period.

The population of the BMA was 5.69 million, according to the 2001 Census, as against 4.13 million in the 1991 census. As per the 2001 Census, Bangalore ranks fifth among the largest metropolitan cities in India, a jump in the rank from the sixth place in the previous decade. Now it is estimated that the population of the BMA is around 7 million and by the year 2011 it will be about 9 million (see Table I). The ever-increasing population would add to the problems of the already strained infrastructure facilities associated with environmental decay and decline in the quality of life in the city. Adding to this is the strain consequent to the ever-increasing 1.5 to 2.0 million floating population in the city.

The City is growing in all directions with development in an irregular radial pattern. The Comprehensive Development Plan for 2001 is proposed for an area of 1,273 sq.km wherein area for development is 531 sq.km and green belt is 742 sq.km**.** In the last 20 years or so it has expanded at a dizzy pace in every direction, and old landmarks have disappeared, coconut groves, vineyards, guava and mango orchards, being cut down to form mean layouts with even meaner streets. Tanks which are essential for maintaining the water table, growing food crops, vegetables and orchards, and attracting bird life, have been drained out for locating bus stations, playgrounds and residential colonies (see Figure 1).

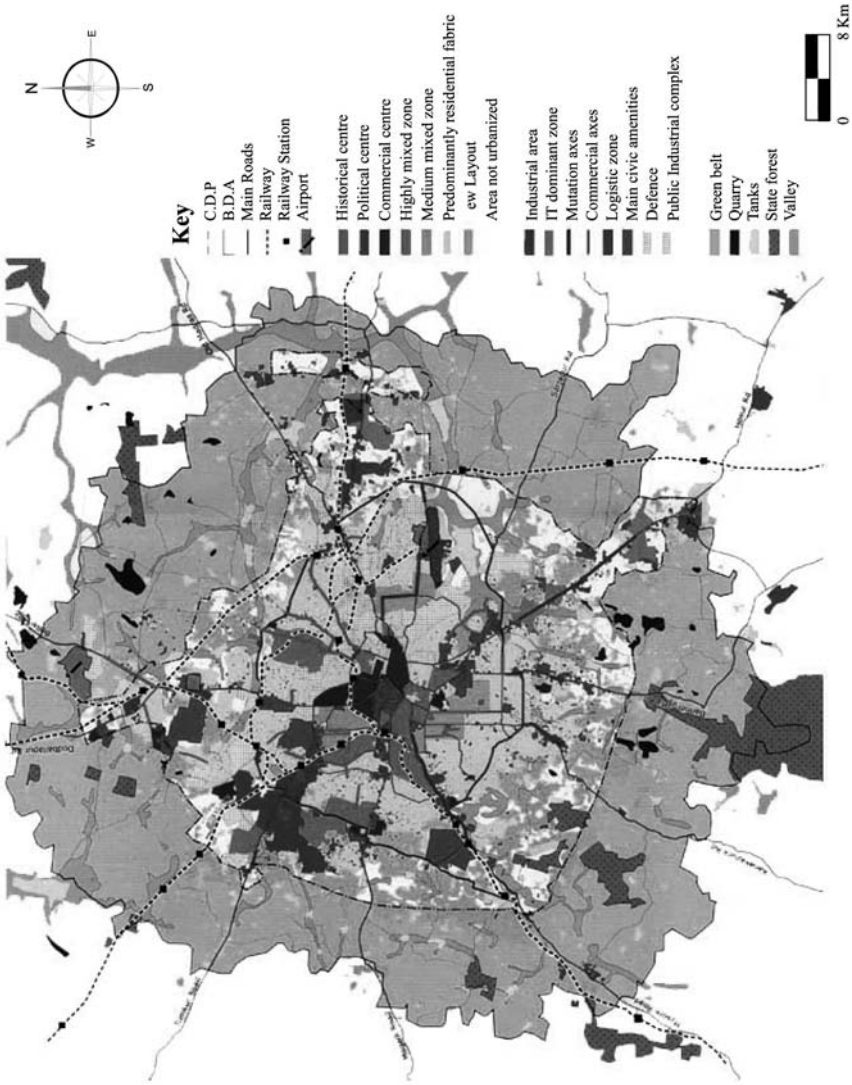
Over the years, urbanization and fast growth have taken their toll and the image is gradually changing from a garden city, to a high tech, "silicon valley" image. The growth of the city has led to larger investments in technical infrastructure; road widening, housing and transportation infrastructure to match the growing needs of the city. The parks, which were once the pride of Bangalore have been facing neglect and abridgement and are in serious need of rejuvenation as centre of social activity, places where citizens could relax, enjoy the surroundings and get relieved from the stress of urban living.

All residential, commercial and industrial layouts should endeavor to increase the proportion to at least 15 percent of developed area for parks, playgrounds and other green spaces (see Table II) – a reasonable norm in urban management.

Census year	Population in million	Percent increase	Area (sq-km)	Percent increase
1901	0.22	–	144.78	–
1911	0.26	14.5	156.43	8.05
1921	0.31	19.2	160.94	2.88
1931	0.39	27.5	174.55	8.76
1941	0.51	28.9	181.24	3.84
1951	0.99	94.9	193.08	6.53
1961	1.20	21.4	255.62	32.39
1971	1.65	37.0	285.95	11.87
1981	2.91	76.72	366.39	28.13
1991	4.13	39.89	466.63	21.14
2001	5.69	37.77	531.00	19.05
2011	9.00	63.22	1,2979.00	140.00

Table I.
Growth of population and area in sq. km in BMA

Source: Census of India, 2001, Series-30, Karnataka, Paper 2, BDA, Bangalore (compiled by authors)



Source: Master Plan (2005), Bangalore Development Authority, Bangalore

Figure 1.
Existing land use in Bangalore metropolitan area

Urban development has generally remained uncoordinated and thus witnessed the growth of slums, shortage of urban housing, intense squatting, inadequate urban services, disparities and discontent in urban life. This has deteriorated the living environment in the city of Bangalore. Thus it is very important that urban land use policy should be based additionally, on ecological considerations. One of the adverse effects of the rapid and sprawling growth of the so-called "Garden City" is the heavy encroachment on parks, playgrounds, gardens and other organized green spaces including tank areas (water reservoirs). This has resulted in a problem of shrinking green areas and grossly inadequate lung space. The agents and agencies in charge of development have very often been neglectful of norms, the government including.

Existing scenario of parks and green areas in Bangalore

Bangalore has developed an abundance of park and avenue trees and green areas, which provide shade and meet not only the purely ecological needs but also an imaginatively planned ambience of sequentially – blossoming trees. Bangalore is known as the Garden City of India due to the large number of parks as well as private gardens, roadside and avenue trees and the magnificent Lalbagh and Cubbon Park (see Figure 2). Bangalore has 705 parks spread across the city in the form of small and medium sized parks as well as large parks. Besides these regular parks, there are around 200 open spaces and green areas, which are waiting to be developed as parks and are without any kind of infrastructure and are basically Community Amenity Sites earmarked for development of community infrastructure such as parks, etc. Many of these do not even have fencing. Among the existing parks, many have infrastructure like fences, play equipment, street furniture, etc. but are in need of repair and maintenance. Thus the existing parks too, except for a few, have not reached their full potential. In spite of laws for protection of trees and pressure of public protests, civic authorities all along have turned a blind eye as the green belt is getting encroached upon. Or, when old bungalows are downed and the trees within felled to accommodate high-rises. Such unimaginative destruction of green resources continues under one pretext or another.

Classification of parks and green areas

Parks in the Bangalore City Corporation area (BCC) are essentially recreational areas with landscape and horticultural design features for passive recreation, implying no damage to plants and trees. Most parks include a jogging track, lawn area and a

Sl. no.	Land use	Area in hectare	Percentage
1	Residential	24,369.21	43.16
2	Commercial	1,643.68	2.91
3	Industrial	3,844.07	6.81
4	Public and semi-public	4,908.91	8.69
5	Parks and open spaces	7,788.15	13.79
6	Transportation	11,697.04	20.72
7	Un-classified	2,213.94	3.92
	Total	56,465.00	100.00

Table II.
Land use for Bangalore metropolitan area – 2001AD

Source: Comprehensive Development Plan (revised), 1995, p. 80

Source: Comprehensive Development Plan (Revised) (1995), BDA (Compiled by the Author)

Figure 2.
Existing scenario of parks and green areas in Bangalore

children's play area. The parks are also dotted with indigenous flowering plants and trees. In case of large parks, their green covers dual up as lungs of the city. Most parks are classified on the basis of their size. For the purpose of this study, a distinction between different types has been explained along with a classification. The parks have also been categorized according to their location into five broad types as per the reckoning of Bangalore Agenda Task Force (BATF) – residential areas, mixed land use areas, commercial areas, industrial areas, transportation infrastructure areas such as median, traffic islands, roundabouts, etc. (Bangalore Agenda Task Force, 2003, p. 7).

Based on the location of the park, there is an intended use of the park: active recreation like jogging/walking/cycling, sports, children's play activities and picnics

and passive recreation such as spending leisure time, flower shows, themes (sculpture park, amphitheatres, etc.) and water bodies/fountains. More specific themes for individual parks may be considered based on the intended uses:

(1) *Regional parks*. Seven Regional parks such as Hoskerehalli Regional Park, Hebbal Regional Park, Mattikere Regional Park, Madivala Regional Park, Doddenakunddi Regional Park, Karenapalya Regional Park and Hossahalli Tank Regional Park present within the inner periphery of the BMA, which are interspersed with larger lakes and valleys are major recreational areas. These regional parks are at the top in the hierarchy of parks with respect to size and importance. Land for regional parks was allocated in the 1995 Comprehensive Development Plan, but they are yet to be developed and thrown open to public use. The other important areas identified in Bangalore for Regional Parks and other major Open Spaces are Race Course, Bangalore Golf Club, High Grounds, Cubbon Park, Dodda Nekkundi tank, Belandur tank, Grass Farm, Cultivated Area, Open Scrub, Hosahalli tank, Hanumagiri Hill, Lal Bagh and Lalbagh Lake, Palace Grounds, Hebbal tank, Mattikere, Bannerghatta National Park, etc.

(2) *Neighborhood parks*. There are many neighborhood parks, which are evenly distributed all through the city and designed and maintained well by the Horticulture Department of BCC as well as other agencies. Out of the total area of the city, 14 percent accounts for parks such as Lal Bagh Botanical Garden (area 39 hectares, 1,854 species, 673 gene and 890 cultivars of plants), Cubbon Park (68 genera, 96 species, total of 6,000 plants/trees), Bannerghatta National Park (located 25 km from the city houses important flora and fauna), Dhanvantarivana at Jnana Bharathi (spread over 15 hectares is a garden of medicinal plants and consists of 414 species) and 365 small parks, 55 well developed, 105 partially developed, and 180 undeveloped parks (JNNURM, 2006, p.22). There is no formal procedure for involvement of private sector participants in greening and development of parks. Some of the parks are a naturalistic garden with two waterfalls and a few children's play equipments. Most of the parks in the city are lush green as the climate is conducive for horticulture and gardens. Parks in Bangalore are utilized to the maximum as they attract old and young, in the early morning hours and in evenings.

(3) *Traffic islands and medians*. Most traffic islands have been greened and fenced with beautiful landscaping. However, from the traffic flow and pedestrian safety point of view these are rather deficient. A good example worthy of emulation is the traffic island sponsored by ITC at the Brigade Road/Residency Road junction. Many companies have come forth to sponsor traffic islands and medians with the objective of maximizing exposure to their brands and as general do-gooders. Unfortunately there is a lack of design expertise for traffic islands.

(4) *Theme/heritage parks*. Lalbagh and Cubbon Park which by size and historic importance are on the tourist circuit:

- The Cubbon Park consists of groves of shady trees and bamboo, turf, grass, flowering plants, creeks and ponds, promenades, seats and, woods and lawns. It is a naturalistic garden and is a huge attraction during holidays. Cubbon Park today caters to peoples' active and passive recreation needs.

The lawns and meadows provide space for families to picnic, the children's amusement ground has many rides and play equipment, the woods provide space for solitude and contemplation and the many paths are popular among joggers and senior citizens.

- The Lal Bagh Darden today has become a very important botanical garden and a national landmark, especially the Glass House, the hill with Kempegowda's tower and the Mughal gardens. The rest of Lalbagh Garden is a naturalistic park, which is used in much the same way as Cubbon Park. Like Cubbon Park it caters to people's relaxation and entertainment needs, cognitive and aesthetic needs (by observing and enjoying nature, the horticultural exhibitions and historic sculptures), and has become a national landmark, therefore steeped in symbolic meaning and importance.

(5) *Historical landscapes (heritage open spaces)*. Chickpet, Lokmanya Thilak Park (Thulasi Thota), Gandhi Nagar, Central Jail – presently Freedom Park, Raj Bhavan, Musical Dancing Fountain, Vidhan Soudha, High Court, Central College, etc. are important historical landmarks and heritage spots.

(6) *Residential gardens*. The residential greens in homestead backyards are a traditional feature of human society. These supplement the role played by public garden and parks. In the city of Bangalore, private residential gardens have been important green spaces and this is a characteristic among the Indian cities and has the potential to provoke individual initiative and genius in the choice and arrangement of plants contributing to the overall health of the environment and also development of ecological consciousness and sensitivity.

(7) *Avenue plantations and boulevards*. Bangalore has 4,850 km of roads, 250 km of arterial roads and 32,850 intersections. There is much scope for developing and imaginatively organizing avenue plantation. The type of trees to be chosen for this has to be left to the forestry and horticulture experts and should not be done haphazardly or arbitrarily. In this tree plantation effort, the suggestions of electricity, telephone, water supply and sewerage authorities have to duly noted. The city has a number of beautiful boulevards the largest being the Laxman Rao Boulevard beginning at South End Circle Jayanagar up to JP Nagar. Several other boulevards like the ones in Indiranagar, Vijayanagar and other prominent areas of the city, reaffirm that Bangalore is a city of Gardens. Tree lined avenues, streets and roads along with green medians and traffic islands are spread all around the city adding to its greenery.

(8) *Institutional greens*. Parks attached to open spaces surrounding huge public buildings like education institutions and colleges, offices, factories and hotels etc. are also an important green space which comes under the types of mixed land use areas. Vast Green areas are found in the unclassified defense land with dense green cover cutting across the city from the east to the north-west. Though they are not utilized by citizens of Bangalore, they form a major lung space in the city. They also become very strong barriers and edges of urban development. Correa and Buch claim that it is the Defense lands, which gives Bangalore its garden city image. The defense services (military) own large areas of land in the city, which are underdeveloped (Correa and Buch, 1990, p. 54). Other land uses are residential and industrial which occupy large areas of the

city and they also contribute to keep the city green. Green areas in and around industrial zones for protective and traffic purposes are to be integrated into the plans for promoting conditions of cleanliness.

(9) *Gardens within the information technology parks*. After 1995, the development of software industries and IT parks in Bangalore, particularly in White-field in the North-eastern sector and Electronic City in the South-eastern sector, has contributed to large-scale growth. The software industries are scattered on certain major roads namely, Airport Road, Richmond Road, Residency Road, Sarjapura Road and also within pockets of Indiranagar and particularly in Koramangala layout. Apart from this concentration, even in city areas also these Software industries have sprung up. The city has grown in all directions. These industries have contributed substantially to greening within their institutions.

(10) *Miscellaneous green areas*. These areas are important from the view point of botanical and zoological gardens as providers of cultural and educational facilities and horticultural shows as events of regional significance. Bangalore has many playgrounds and sports fields, some more organized and structured than others. For example the facility in Madhavan Park has a skating rink, basketball courts, a running track and soccer and cricket grounds, whereas some of the others are just open fields where several groups are playing different games, mostly cricket and soccer.

(11) *Green belt and urban forests*. The single largest green area around BMA is the Green Belt comprising agricultural land, protected forests and valleys. A green belt covering 742 sq.kms of the Local Planning Area was proposed in the Revised Comprehensive Development Plan all around the conurbation area to sustain and improve the climate of Bangalore. Steps have been taken by all the Departments and Agencies concerned to prevent encroachment of land in the Green Belt. Large scale tree planting, providing recreational facilities and other public and semi-public uses are proposed in the Green Belt. For example – recreational, playgrounds/stadium/sports complex, parks and gardens – public open spaces, special recreation zone – restricted open spaces, multi-purpose open spaces. Such changes in the green belt area diminishes the quantum of ecological wholesomeness and to countervail this diminution, policy changes and administrative action have to be effected to increase the green belt area further and duly proportionately. The net and proportionate green belt area should in no case diminish.

Jarkabandi State Forest, Yalahanka Jungle and Plantation, White Field Reserved Forest Mixed Plantation, Konankunte Silver Oak Forest, JP Nagar Reserved Forest (Mixed Trees), Land Army Forest etc. are some of the important city forests within the BMA. Urban forests and green belts are massive afforested areas, which improve the environment and check pollution and dust in these areas; these also serve as oxygen banks for the neighboring colonies.

Management of parks and green areas through agencies

The BCC is maintaining parks and gardens under the care of 858 personnel, whereas, the Horticulture Department of Government of Karnataka is maintaining Lalbagh, Cubbon Park, M.N. Krishna Rao Park, Kumara Krupa Guest House Gardens,

Balabrooie Guest House Gardens, Raj Bhavan Lawns, LRDE Musical Fountain, Ministers' Bungalows and Government Hospitals. These have their own establishment and personnel. However, some parks and green areas are exclusive to the institutions maintaining them and variations can be found in them such as heritage parks and theme parks

The BCC along with the Bangalore Agenda Task Force envisioned the rejuvenation of the "Garden City Image" of Bangalore, to revitalize the parks, encourage more social participation and enhance the richness of the urban fabric of Bangalore. Despite budgetary constraints and limitations, the BCC has taken up several projects to revitalize through the creation of a large park with a bio-diversity theme, a deer park as well as a park with the lotus theme (Bangalore Agenda Task Force, 2003, p. 1). For example, in Tavarakere Park in Bannerghatta Road, the thrust is on revival of "lotus" tank where as many species of lotus are being sourced to be planted along with a focus on the vegetation of Bangalore to be showcased. New technique of wetland management and rainwater harvesting is contemplated upon to ensure water conservation and also sustainable maintenance of the quality of water bodies (Ibid, p. 5). Tavarakere Park an extensively developed aesthetic-looking park is spread over 9 hectares of land. True to its name, the park has lotus ponds with a variety of beautiful lotus flowers. Bubbling fountains, cluster of gardens, a food court, centrally located open structure for relaxation are some of the facilities available here, creating an enchanting environment for people of all age groups and all walks of life.

A special task force comprising the horticulture and other government departments, and citizens, town planners, landscape architects, corporate bodies, NGOs and voluntary organizations is needed to address the matter. Currently the city is the floricultural capital of India. It accounts for nearly 70 percent of India's flower exports. With so much in its favor and the availability of hi-tech and bio-tech resources, Bangalore can well become a model as a clean, green and beautiful city (Roye, 2006, p. 2).

Budget for management of parks and green areas

Budgetary constraints have forced the neglect of many parks, especially the smaller neighborhood parks in residential areas. Therefore there is an urgent need to rejuvenate these parks as neighborhood centers for recreation, in order to provide facilities for citizens. This would also improve living environment for citizens and provide active and passive recreation centers within their neighborhood.

Promoting public-private partnerships and participation of citizens, resident welfare associations are also said to be among the devices to rejuvenate parks. Participatory initiatives of Lion's Club, Swabhimana and a resident's group in four parks have been given recognition. The tendering system of most of the envisaged tree parks and theme parks has been completed and the works are ready to be implemented by next year. The JP Park is a bio-diversity park and the third largest public green space in Bangalore, next only to the Cubbon Park and Lalbagh.

Given that infrastructure development, maintenance and other activities gained priority in budget allocation, the amount of resources available for development of parks and for the greening of the city are limited. The Horticulture Department is short of funds and even maintaining the existing parks and green areas is difficult, given the size of Bangalore and the number of parks.

Collection from levies such as house tax, building license fee, road-cutting charges, fines, etc. are increasing year after year. A proportion of these collections should go into an escrow account exclusively for the development and maintenance of parks. Development of parks, green areas and water bodies in new and emerging localities should receive priority as high as roads, water connections, sewerage facilities and electricity.

Suggestions and conclusions

Bangalore has been witness to inadequate maintenance of parks and green areas, which have been the traditional characteristics of Bangalore. Recognizing the need to revive and augment park facilities, this study has suggested the adoption of a systematic approach to the creation and maintenance of civic amenities particularly promoting green spaces, social forestry and efficient maintenance of existing parks/green assets.

Suggestions

- There is no comprehensive development in the BMA even though many parks are envisaged as a part of such a development. It is suggested that the authorities think of utilizing the services of NGOs as well as Multinational Companies to develop these parks and maintain all-through the year with a view to contribute positive elements in the eco-system and enhance the beauty of Bangalore as a Garden City.
- Except Cubbon Park and Lal Bagh, no big parks have been newly developed. Bangalore needs six to eight regional parks of reasonable size. In this regard, it is necessary to develop them well distributed throughout the city. It is suggested that the tank beds and the surrounding areas offer the ideal location for the regional parks.
- In the regional parks, the provision is generally made for facilities such as shelters, cafes, guest houses, holiday huts, children's parks, picnic places and facilities for enjoying outdoor life.
- The live tanks in the conurbation area and the green belt area provide large tracts of land for foreshore planting. The planting and development of tree parks will help to prevent the encroachment of tank beds.
- Certain layouts may not have sufficiently many well-maintained parks. They have to come out with an action plan to develop parks in these layouts under the banner of integrated urban environment management programme.
- While granting license, the authority will have to insist on at least two saplings being planted and trees grown on sites where the site area exceeds 300 sq.m. and select the tree species which suits to the width and length of the streets/avenues for plantation. This is particularly to be emphasized when multi-storied structures are raised.
- Drip irrigation and rainwater harvesting have been made mandatory in all the parks. Adequate water facilities have to be ensured before developing a park. This can be achieved by combining rainwater conservation with development and maintenance of every park.

- "Adopt-a-park" scheme has met with tremendous response from both civilians and associations coming forward to maintain parks in their areas/localities. BMP may encourage this scheme further.
- In parks and green areas, beautification plans including cast iron benches, restoration of the playing of band and proper illumination are recommended.
- Regulation should be made so that the use of plastic or plastic bags in and around public parks, open spaces and lakes/tanks is prohibited with a suitable system of penalties.
- Urinals are mandatory in all large, well-developed parks developed by the BMP. So far, only proposal for toilet in the city's major parks have been drawn up. This facility should extend to all the parks and public green areas; should be actualized expeditiously. Maintenance of urinals can be undertaken on a PPP basis.
- Encroachments in some of the parks and gardens have to be removed and fenced. These encroachers are generally politically powerful and are bereft of environmental concerns.
- The teachers, parents and others should encourage children to plant trees in the school/college premises, establish plant nurseries in schools and also water them. The green space within the schools and colleges are looks strikingly beautiful. This will serve as "a strong attachment towards environment protection". The attitudes of the young thus get moulded at the school stage itself. This is significant from the PPP point of view.
- Government should set up an Implementation Agency and periodically review the implementation of the recommendations about parks, open spaces and green areas. For this purpose, the Forest Department, BDA, BMP, Minor Irrigation Department, BWSSB and Town Planning Department may be involved. Their work has to be coordinated.

Conclusions

The people in urban areas need a break from their busy, tiring and often unhealthy and dreary routine. As everyone cannot go to distant National Parks or forests, it should be possible for the Government to bring a part of nature closer to city dwellers. This can best be achieved by developing pieces of land in or near cities as parks, gardens and mini-forests in and around the urban area. These green patches should be well distributed to function as city lungs. The local administration in Bangalore has already shown awareness of this need and parks and gardens have been developed in available land. As the maintenance of gardens is expensive, larger areas can be planted with suitable trees, shrubs and creepers to provide a forest atmosphere; and operational cost may be less. In green belt area, flowering trees, shrubs and creepers have to be planted. Such forest parks are generally very popular and contribute to the general uplift of the health of Bangalore urban population.

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