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Importance Of Urban Forestry With Special Reference To Kolkata

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Abstract: *Urban forestry is the trees and related vegetation in and around a city. Tree plantation is indispensable in an urban settlement and essential for landscape architecture. An over urbanized city like Kolkata, the trees are rapidly losing their existence. This can affect the environment and overall biodiversity. Proper and drastic action from municipal corporation, NGOs and other private agencies and improvement of public awareness can restore the existing greenery and increase it.*
Keywords: *Kolkata, urban forest, parks and recreational area*

I. Introduction

Urban dwellers are now undoubtedly accepting the importance of urban forests in an urban area. They now understand that forestry is indispensable in urban landscape, infrastructure and quality of life. The urban forest is the trees and related vegetations in and around the city. Trees protect the urban climate from severe pollution and provide a climate buffering service [1]. Tree cover removal not only damage the natural cycle, unnecessary heat release also increase the temperature of air. That will negatively affect the environment. Tree cover controls wind speed and minimizes the air pollution. Free flow of wind increase dust pollution, affect buildings and monuments. Indian cities were famous for their royal palaces, decorative gardens and avenue trees[1]. But to provide accommodation and civic amenities to countless population turned truly into gas chamber. Kolkata is no longer different from them. Creating healthy urban forests in city requires positive action on political, social and technical fronts and involves citizens , companies, municipal corporations, government agencies , political leaders , NGO's and skilled urban foresters.

Objective of the Study

- Discussion of the usefulness of urban forestry
- Highlight the present status of urban forestry in Kolkata Municipal Corporation area

II. Methodology

The present study is based on qualitative and quantitative approaches. Secondary data were collected from various sources. Simple quantitative techniques were used to derive results, and cartographic techniques were employed to facilitate visual interpretation.

Study Area

Kolkata Municipal Corporation Area (KMC) (22˚ 28' 003″ N to 22˚ 37' 303″ N latitude and 88˚ 17' 303″ E to 88˚ 25' 003″E longitude) is bounded by river Hugli in the north-east, South 24 Parganas district in the south and south-west, Salt Lake City in the east and North 24 Parganas district in the north. KMC covers an area of 187.33 sq. km and is divided into 141 wards and 15 boroughs. Before 1983 the city was covered by 100 wards, which was extended to 141 wards after annexing the municipalities of South Suburban, Garden Reach and Jadavpur in 1983.

Needs of Urban Forestry

Effect of urbanisation is dangerous today. Newly created well planned area with sufficient greenery turned into a shanty town within a short time.

The urban forestry is a specialised branch of forestry that has its objective not to provide wood products to urban dwellers[2]. It has ecological, social and public health values. Big trees and open areas covered by shrubs keep cities cool by making a canopy. Acting as natural filters and noise absorbers, trees improve microclimates and protect and improve the quality of natural resources, including soil water vegetation and wildlife. Trees with their natural beauty soothing the mind of inhabitants and maintain the psychological health.

Most of the large cities are situated beside a river which is its lifeline. Trees can protect over siltation and river bank erosion and increase water table and decrease water pollution.

i) Aesthetic value of urban forestry: Trees, forest and parks have their eternal aesthetic value that directly and indirectly affect the urban dwellers[1]. Presence of trees refreshes our body and mind, recharge energy, ease tension and improve mental health. Nearness of trees help patient to faster recovery. Parks refresh mind and creates recreational opportunities for people.

ii) Urban forestry and environment: Unplanned, overcrowded concreate building and metal roads in a city allows a meagre amount of rainwater to percolate into the soil. High concentration of carbon-di-oxide, carbon monoxide, sulphur–di-oxide in the air turned the area into a badly ventilated one. Urban trees play an important role in these situations.

iii) Most important problem of urban area is poor quality of air. Plants purify air by absorbing large amount of sulphur-di-oxide through leaves. They trapped aerosols and small particles and acts as dust filters. Tree cover enhances relative humidity of air through evapotranspiration. Open soil absorbs gaseous pollutants like carbon monoxide, sulphur dioxide, nitrogen dioxide, ozone and hydrocarbons. Trees and shrubs control air temperature extremes by tone down solar radiation into their own use. The shade of one large tree may reduce the temperature of a given building to the same extent as would 15 air conditioners at 4000 British Thermal Unit (BTU) in a similar but unshaded building[1] (Tewari,1995). Excessive noise is a major problem of cities. Trees can bring down the intensity of noise by absorbing and scattering them.

iv) Soil and water conservation and management: Tree covers absorb rain water and allow the drained water to percolate into the soil. It helps to reduce water scarcity problem in urban areas. Trees and forest protect the soil by their root from harsh seasonal rain and automatically save the people's lives and homes. Urban trees lower urban waste material and regenerate the raw material. Some trees are able to absorb the polluting material and protect the land from contamination. So that every inch of unused, partially used, degraded and waste landfill areas should be reclaimed through afforestation and converted to parks. More afforestation maintains the biodiversity of urban areas and balances the ecosystem.

v) Social benefit: Presence of trees improves air quality in urban areas and decreases respiratory illnesses. Green surroundings help people to relax and refresh mind. Parks, zoos, botanical gardens are the ideal place for recreation to the fatigue urban people.

Urban Forestry – Kolkata Corporation Area

The parks and garden wing of KMC was set up during 1976-77 [3]. The main objective of this department was to set up a suitable organisation equipped with the required technical expertise for maintenance and improvement of the existing government gardens and to create new parks and gardens all over the state the district and sub-divisional towns and other urban centres in a phased manner according to availability of site and provision of funds for the purpose. The wing should be able to offer its technical expertise in executing landscaping works, planting the roadside avenues, boulevards etc.

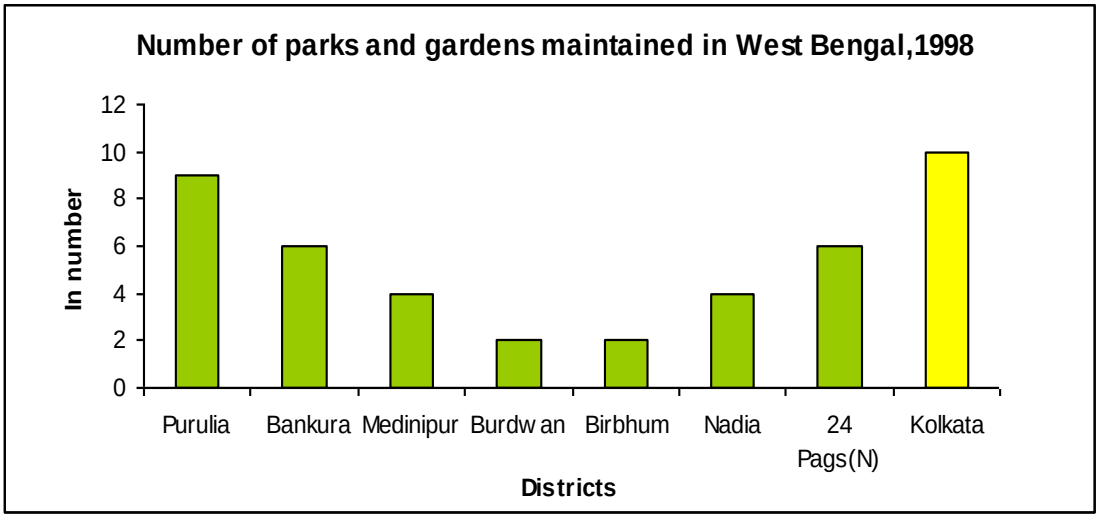

Fig: 2 Source: Report on the state of environment in West Bengal, 1998 [4]

Nature and Characteristics of Trees

I. The trees found in Kolkata are very common and similar to trees found in any other main roads of India[5]. Maximum portion in Kolkata, especially in poorer quarters, Banyan (Ficus benghalensis), Peepul (F. religiosa) and Neem (Azadirachta indica) are the most common trees. But for some years the city planners changed their views for planting our streets and avenues. They replace huge, untidy shady trees to lay down new trees which have quick rate of growth, spreading canopy, perennial and compact habit that will limit the ultimate size of the tree as well as sprawling of branches[6]. It must be steady and be able to prevent violent winds. If they give beautiful flowers that will be better but it rarely matters for their selection.

II. The trees which are most suitable are the child life tree (Putranjiva roxburghii), Debdar (Polyalthia longifolia) and the Spanish mahogany (Swietenia mahagoni) [7]. The Spanish mahogany are eventually attain a size that will exactly needed for a town. The Bakul (Mimusops elengi) and the Chhattim (Alstonia scholaris) are two examples of compact trees with medium size and evergreen leaves. Bakul trees are very frequently found in streets and gardens of Kolkata. Another suitable tree for street planting is Desibadam (Terminalia catappa). It has horizontal branches, flat head covered by bright green leaves.

III. Some trees are found rather smaller proportion in Kolkata. Paras or Portia (Thespesia populnea) tree found beside the street are quick growing with a round bushy head covered by evergreen leaves and colourful yellow flowers. This tree is extremely suitable for crowded area. Another tree with almost similar habit but slower in growth is the Alexandrian laurel. It contains beautiful green foliage and white flowers. Another tree which is found in small proportion in Kolkata is the Indian birch. Bright green leaves and orange flowered Bay chestnut trees are very common in Kolkata. But these trees are not so steady to prevent wind and broken down frequently. Moreover its flowers are largely hiding under the leaves. Lepisanthes tetrephylla radik are the evergreen plants found here with no significant beauty.

IV. The trees which are most famous for their flower and very common in streets of residential area are Gulmohar (Delonix regia) trees[5]. They produce a splendid sight in the hot season when they are in full bloom. But they are not suitable for street planting because they are brittle, need regular maintenance but provide insufficient shade. Through these trees are planted in large number beside the street but they are more suitable for garden and parks. Their branches are too fragile and broken down frequently. A large number of Jarul (Lagerstroemia spp.) trees are found beside Central Avenue, Kolkata. Though they are not suitable for this densely populated area but they provide short lived pale mauve or white flower and dense shade.

Present Position

The forestry of Kolkata Municipal Corporation area is decreased drastically[4]. The city's green cover now stands at a dismal 5%, which is way below the requirement of 15 % for metros (The Times of India, June, 2010). The city lost her age old trees rapidly because of unauthorized cutting due to developmental works. As a result the trees of KMC area mostly concentrated themselves into some parks and squares, in road side islands, under the flyovers and in ornamental median strips between two roads.

Table 1: List of parks maintained by KMC, 2012-13

Ward No.	Name/Location	Characteristics	Area(sq.mts)
2	Park at Biswanath colony, south sinthi road. Park at Panchanantala Park at Sabji Bangan	Children's park Children's park Playground	1226.66 NA NA
4	C.I.T park, Rani Harashamukhi Rd. Biplobi Ganesh Ghosh Uddan, Northern avenue park, Northern avenue	Park and play ground Children's park and playground Children's park	NA NA NA
5	Bengal Gymkhana ground Children and ladies park, Tarasankar Sarani Jatindra Mohan park, Tala Tala park circus maidan, Tarasankar sarani	Nursery and playground Nursery and playground Nursery Playground	NA 27758.52 27758.52 NA
7	Sister Nivedita uddan	Playground, children's park	NA
9	Kumartully Park, 18 Abhoy Mitra St. Maharaja Narendra K. Deb park	Playground, children's park NA	NA NA
12	Gouribari C.I.T park Deshbandhu park, Raja Dinendra st.	Children's playground Nursery,ladiescorner,playground	1542.60 72310.94
16	Goabagan C.I.T. park	Playground	3110.29
19	B.K.Pal park	Children's park	4433.19
21	Jorabagan park, 2 Baisnab Sett.st.	Playground, park, religious function club	7549.98
23	Satyanarayan park, Tarasundari park, 56. R. Sarkar garden lane	Children's park Vat CESC's room	2846.45 1615.90
25	Girish park, junction of C,R, avenue and Vivekananda Rd. Kalisinghi park Saroda Banerjee park	Children's park, landscape, garden fountain, lilypool. Playground Playground	3649.58 2782.36 2782.36

26	Rabindra kanan, 9. Beadon St.	Playground, park, religious centre, CMC building, club	14084.10
27	Azad hind bag, 5. Bidhan Sarani	Park, shelter shed, flower garden, swinmming pool	15785.57
28	Sadhana Sankar uddan, 204/2 APC rd.	Mohila yoga kendra	3545.06
29	Bagmari park, Maniktala main rd.	Playground	NA
30	New park, Narkeldanga Rd.	Children's park	NA
31	A.P.C park, Ramkrishna Samadhi Rd. Ramkrishna mahila sishu uddan	Park, nursery, green house Park	NA NA
32	Prafulla Khudiram uddan	Children's corner, landscape garden, garden fountain, lighting	NA
38	Vidyasagar park, 26/1 Badur bagan lane Hrishikesh park Jhamapukur park, 36. G.P.C lane	Children's park Park, Playground	3356.94 NA 1895.71
40	Vidyasagar uddan,college sq.	Park, swimming pool	17792.21
45	Millenium park, babughat to kadamtala Town hall and Millennium park	Garden Landscape, flower garden	NA NA
46	Chaplin sq. and CMO bld., kol-13 Park, opposite pearless inn	Children's corner NA	NA NA
47	Girin Banerjee park, Ganesg avn.	Park and nursery	2742.41
49	Shradhananda park ,34 Surya Sen st.	Playground, nursery, flowerbed, KMC office	6613.55
50	Santosh Mitrea sq.	Playground, nursery	9832.53
55	Convent park, 13 convent rd. Ramlila park C.I.T. padyapukur park	Park, nursery Playground, park Playground	4297.55 NA NA
56	Park, 108. D.C.Dey Road	Children's park	3854.42
62	Hazi M.M. Square Mireea Elliod sq. Triangular park	Pond Playground NA	16588.22 2325.02 NA
63	Rana Pratap uddan, 14/1, Loudon st. Nature park, 4, Loudon st. Alien park,28. Park St. Victoria sq., Albert Rd. Mintoo park, AJC Bose Rd.	Park, nursery Nature study park Children's park Park, water body Park, water body	4180.50 NA 5493.18 13310.71 14782.25
64	Park circus maidan	NA	36954.40
68	Park, Ekdalia Rd. Park,7, Carnfield Rd.	Children's corner Children corner	NA NA
69	Maddox Sq., 9, Pankaj Mallik Sarani	Playground	NA
70	Dwarkanath Mitra sq. Northern park, 48, Allenbury Rd. Woodburn park, 28, woodburn Rd.	Playground Playground Park, playground	NA NA NA
72	Landsdown sq., 49, Padmapukur Rd.	Water tank	NA
73	Harish park, Harish Mukherjee Rd. Jatin Das park, S.P. Mukherjee Rd	Park, Playground Park, Playground	NA NA
74	Alipore office garden	Nursery	NA
76	Padmapukur Sq.	Tank, garden	NA
78	Nabab Ali park, Ekdalia	NA	NA
81	Datu Fadkar Memorial, New Alipore Park, New Alipore O block Park, New Alipore H block	Park Park Park	NA 2960.17 1872.86
82	Chetla park M. Sanyal uddan	Ground Nursery	8568.17 NA
83	Deshpran Sashmal park	Playground, park	4265.97
84	Kalighat park	Park, playground	NA
85	Deshapriya park	Playground, Tennis court, park	27628.65
86	Triangular park	Park, playground	NA
88	Mysore garden, Tollygunge Rd. Triangular park, Pratapaditya Rd. C.R.Memorial garden	Flower garden Garden Flower garden	3015.35 NA NA
92	Tanupukur park, Sarat Ghosh garden rd. Tarakeshwar Sen uddan, Babu Bagan Bimal Ghosh uddan	Park Playground Park	NA NA NA
93	Jodhpur park	Park	NA
95	Tilak nagar park	Park	NA
96	Sishu uddan , Regent estate Layalika park (N.S.C.Bose Rd.) Bijaygarh park, Bijaygarh rd.	Playground Park, playground Park, playground	NA NA NA
97	Regent park, N.S.C Bose rd. RabindraVivekananda sardhosatabarsh uddan	Park Playground, nursery	NA NA
98	Jibananda park	Park	NA
99	Niranjan Sengupta park Park, Sree colony	Park, playground Children's park, playground	NA NA

100	Lakshmi Narayan Park	Children's park	NA

Source: Report of Kolkata Municipal Corporation, 2012-13, compiled by author

In this over urbanised and extremely polluting city like Kolkata, the parks and squares are the sole marks of greenery and the lung of the city. But by carefully studying the above mentioned list it is found that most of the parks are used either for commercial purpose or for some social and recreational purpose. Concrete construction even covered the bare soil through which some rain water can percolate. Soil compaction and physical damage can create stress and shorten the life of trees. Plantation of trees whatever small or large get rare importance.

Table-2: List of ornamental median strips maintained by KMC, 2012-13

Area	Length (m)	Area	Length(m)	Area	Length (m)
Gariahat Rd.	850	D.L.KhanRd. junc.	NA	Cathedral Rd.	348
A.J.C Bose Rd.	215	Ultadanga Rd.	Island	Ultadangamore	NA
Rashbhari Avn.	0319	Central Avn.	4500	Sarat Bose Rd.	2180
J.L.NeheruRd.	580	Gariahat rd.	1500	A.MukherjeeRd.	1690
Anwershaw Rd	1884	Bankim M. rd.	1600	S.P.Mukherjee Rd.	381
D.L.khan Rd.	381	Nationallibrary Avn	910	Park street	1670
CathedrawalRd.	876	Queenceway	589	Abdul R. Avn	826
Hospital Rd.	677	Rashbehari Avn connector	1500	Southern Avn (both side)	826
C.I.T Rd.	20000	Shakespear Sarani	1880	Alipore Rd.	550
Belvedere Rd.	680	Harish Mukherjee Rd.	381	A.P.C Rd.	690
Philips more	600	Goalpark to Dhakuria	330	Girish Avn	225
Kshirod V.V.Avn	300	Sundari Mohan Avn	600		

Source: Report of Kolkata Municipal Corporation, compiled by author

Constraints and Some Remedies in Urban Forestation

This is easier to deforest urban area than to forest it. There are various problems in the way of urban forestry development. Lack of funding is the main problem in systematic planting, regular maintenance and daily paste control. Urban forestry is the less priority activity to urban planner. This is because of inadequate knowledge regarding economic, social and biological benefit of trees. Still people think this as useless, luxurious activity to the poor city like Kolkata. The scarcity of land is the key problem to urban forestry. People cannot sacrifice one inch of land where sometimes ten to twelve person share a small room[1]. Unplanned, fastened urban fringe remained untouched to forestry programme. Above all there are very few opportunities for practical training and education to urban forestry programme so that the works whatever is done remained unorganised and unscientific.

Urban trees grow in stressful environment which increased their ability to protect disease and paste infection[1]. But low nutrient content, moisture deficient soil, intensive air and water pollution needs minimum nurturing for saplings. Species selection demands maximum attention to urban planners. Hedge type plants and decorative garden plants can beautify the city than to purify the environment. Large shady trees will cool the air, increase the amount of rainfall. Bare soil increase dust particle into the air. Trees are the only alternatives to decrease this. Not only the parks and square department, but the public works department, environment protection agencies, the horticulture department, natural forestry department have to involve in this work and there should be intersectional linkages to get best result. Municipal authorities should take the following proposed actions to protect the trees:

1. Campaign for benefit of urban forestry
2. Encroach open space to plant large trees
3. Laws towards mandatory roof top gardening for high rise building.
4. Tax benefit to urban dwellers for planting trees in their premises
5. Organising frequent awareness programmes, seminars, workshops, training programme towards the importance of trees specially to protect the urban environment.

III. Conclusion

Urban forestry is a current issue to urban forest management which includes year-long planning, professional coordination and local participation. Urban forests are economic assets. It deserves proper maintenance and nurturing to protect biodiversity and urban ecology. Financing in urban forestry programme, involvement of private and public organisation and professionals in the awareness of land developers, home builders, municipal authorities, persons involved in planning board and urban dwellers can bring liveable and sustainable environment condition of a city like Kolkata.

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