URBAN GREEN SPACES
WITH REFERENCE TO THE CITY OF COLOMBO

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Abstract

Historical evidences show that green spaces were a part of every city in human civilisation whether it is in Mesopotamia, Indus valley or in the later developments in Europe. Sri Lanka also had a very prominent affiliation with green spaces in its cities in the early periods. •

When Colombo became the capital of Sri Lanka under foreign rulers the city adapted many characteristics of those countries. The first prominent plan for the development of the city was brought forward by Sir Patrick Geddes. Later on there have been a series of proposals, the newest one being the Public Outdoor Recreation Spaces (PORS)Plan for Colombo, which goes into details of a nesting concept having a hierarchy of parks. The prevailing legal framework is also not effective as it does not directly address the issues in protecting the existing green spaces.

With the pressures of population increase, urbanisation and industrialization several undesirable outcomes such as fragmentation of land, environmental pollution, urban microclimatic effects etc have surfaced. There are a number of green spaces in the city of Colombo, some being maintained well and some being neglected to the point of being lost as a green space.

Urban green spaces have a number of benefits viz. ecological, environmental and social. Colombo is progressing slowly towards protecting and enhancing its green spaces. There are some examples positive and negative throughout the world that we can consider as a base in developing our own green space network.

We have to speed up our work towards achieving a desirable amount of green spaces in the cities since the forces that destruct and destroy them are more powerful and have more speed in making even the available spaces dwindle during a little time span. As Martin Luther (1483-1546)expressed,

"For in the true nature of *things, if we rightly consider, every green tree is far more glorious than if it were made* of *gold or silver."*

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What would the world be, once bereft

of wet and of wilderness? Let them be left,

O let them be left, wilderness and wet;

Long live the weeds and the wilderness yet.

Inversnaid 1881 – Gerard Manley Hopkins

URBAN GREEN SPACES

With Reference to the City of Colombo

Prelude

From the beginning of human life on earth the surrounding landscape has been the living space available to them. Humans saw, touched, heard, smelled and experienced the landscape around them. Natural spaces are man's basic desirable experience and characteristically they provide inspiration, comfort and relaxation. The sustainable natural environment which had no major outside interferences was greatly disturbed with the onset of the industrial revolution. The so-called development, emphasised on man made structures which were dominating features of the landscape. With a dominance of monetary values, people saw having green spaces in cities as a waste, thus reducing these spaces more and more. Now with more haphazardly developed concrete jungles around them, people have started looking back at their beginnings.

Most city dwellers love green space. Amidst the noise and stress of city life, it is wonderful to come across an island of green. Cities can be best judged by the

quality of their open spaces. Bodies of water, trees and proper landscape designing assist to increase the quality of urban space. Green spaces act as transitional spaces between built environments thus giving a variety of experiences when one is traveling through these. To the stressful minds of the time-driven city dwellers green space comes as a soothing experience and is a source of spiritual upliftment. Apart from this, green spaces provide ecological, social and economic benefits to the society which we may not have been seriously thought of.

The city of Colombo being the capital of Sri Lanka has faced all the ups and downs that the nation has had to endure. As a developing country according to International standards, Sri Lanka has had to struggle to get out of the financial difficulties it is burdened with and a terrorist war to attend to. One must look at the development of the City and its green spaces keeping this background in mind because the priorities of the Sri Lankan people perhaps differ from other Nations of the world.

Topic Explanation

An area with a high density of population and an agglomeration of Institutions, services and other facilities and high building densities can be called as an urban area.

According to Indrasiri L.H. (2005),

> 'On the basis of the analysis of all the factors with the consideration of a growing urban environment the following definition is recommended for the identification of urban centers in Sri Lanka:
>
> ..." a defined area with a population of at least 5,000 inhabitants with a relatively high concentration of urban services, amenities, and facilities in relation to the province it refers to, where such activities are sufficient

enough to stimulate the economic performance of its immediate hinterland. The lower order center should have its corporate area of at least 350 hectares of land and it should be significantly important in delivering the services at the divisional level administration or either at local, regional, or national level or performing as either a major commercial, industrial, tourist/holiday resort, recreational, transportation, religious or defense center.

At least 50 percent of its population should have access to electricity for lighting, and safe drinking water either piped or well, 25 percent have easy access to communication facilities and 75 percent have easy access within 0.5 km distance to basic social infrastructure facilities such as primary school, government dispensary or hospital or ayurvedic dispensary and 1 km distance to other institutional services".

When urban outdoor/open spaces are considered they may be public or private spaces situated in city areas. The open spaces in cities may have varying degrees of hard and soft landscaped areas which are inhabited by the city dwellers. It is areas with a predominance of soft landscape, whether private or public, that may be categorized as urban green spaces.

As defined in 2004 by the URGE Project-A project having twelve partner institutions from six European countries and which works towards the Development of Urban Green Spaces to Improve the Quality of Life in Cities and Urban Regions,

'Urban green spaces are understood as public green spaces located in urban areas, mainly covered by vegetation (as opposed to other open spaces) which are directly used for active or passive recreation, or indirectly used by virtue of their positive influence on the urban environment, accessible to citizens,

serving the diverse needs of citizens and thus enhancing the quality of life in cities or urban regions.'

In Europe the term 'green' is often used for grass areas. It is specially being used for cricket fields and golf grounds such as in 'Golf Greens'.

Current Importance of the Topic

The need for urban space began when man gave up nomadic life and started settling down in one place. Early man was living in caves or other organic structures with the least disturbance to the environment. Since man emerged as an organized and intelligent being on this planet, human settlements began to grow in size and number, increasing the disturbance to the environment.

Cities are places where this disturbance to the environment may be easily identified. The natural environment in the city is gradually getting replaced by the built environment.

This gradual disappearance of natural land or soft landscaped open space in cities has become a cause of frustration in the minds of most city dwellers. The use of open green space as a planning tool has become an accepted practice since the inception of planned cities. Ancient town developments had parks for hunting, pleasure, relaxing and for many other purposes. Properly planned cities everywhere in the world since ancient times have open spaces; specially green areas. But today, due to over population and increase in building activities the open green spaces in cities are fast decreasing.

Scope and Limitations

Sri Lanka is a tropical country. Being in the wet zone of Sri Lanka, Colombo has the tropical wet zone characteristics. Colombo is a rapidly urbanizing commercial capital with haphazard development in every remaining open space possible. Therefore this study concentrates on the fast dwindling spaces of green that are to be found in the city, and particularly on those with natural air flow movements and sunlight, open to all the external environmental conditions.

Method of Study

The study examines, explores and comprehensively describes the role of the green spaces in our urban areas, the functions they have and how important a planted or soft landscaped area is to a city filled with dust noise, heat, glare, vehicle/industrial emissions and often undesirable conditions. It was done with a literature review and a qualitative survey of the green spaces in various countries as background studies assisted with examples in the city of Colombo.

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CHAPTER ONE:

CONCEPT OF URBAN GREEN SPACES

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CONCEPT OF URBAN GREEN SPACE

Cities have long been centers of collective human activity. Ancient city-states were the administrative, military, economic, legal, educational and artistic centers of the geographical areas they ruled and influenced. The first cities probably arose as men moved from small scale family or tribal agriculture to more productive, stable and predictable agricultural systems capable of creating surplus. These encouraged diverse and specialized human occupations detached from the tilling of land yet dependent upon and sustained by it. Today even those involved in the most sophisticated human activities retain this ancient tie to the land. It is this relationship which is perhaps the most basic one existing between the city and its biological setting.

1.1 Historical Background – Early Civilizations

From the very beginning of civilization and the formation of cities or urbanized areas, urban green spaces have been created for different purposes. The design ideas arose in the mind of intellectual man with the effect of the interacting forces such as, geology, society, economics, morals and philosophy always responding to past experience and sometimes to obtain tranquility and sometimes it's opposite.

> According to Geoffrey and Susan Jellicoe (1987), 'all design therefore derives from the past, conscious or subconscious, and in the modern collective landscape, from historic gardens and parks and silhouettes which were created for totally different social reasons. Fundamentally these again derived from impressions of the world: the classical from the geometry of agriculture, the romantic from natural landscape. Only the small private

garden remains true to its instinctive unchanged purpose of expressing, protecting and consoling the individual.'

"Mans expressed relationship to his environment developed considerably during the Neolithic (8000 BC to 4000 BC). Earlier he was a hunter and during this time he became an agriculturist. He started cultivating along the major river valleys which had fertile soils. During the Bronze age (4000BC to 2000BC) because of changes of climate, forests moved in directions that in some areas brought serious conflict with the agriculturists. From 2000BC onwards, an observer would now see a curious change come over the surface of the earth. Forests were being cleared and the scene was changing from the natural to the man made. Previously, such transformations had taken place mainly in the river valleys and these had developed in to the centres and monuments of high civilization".

In the early civilizations the concept of gardens may have originated with the religious beliefs and mythology. Most of the religious faiths describe gardens or a paradise with beautiful trees and water features. In Mesopotamia the primitive settlements along the river later became organized city like structures called 'Temple towns' of the Sumerians.

Fig. 1.1
A Sumerian City with the temple in the middle
Source;
www.irows.ucr.edu

These which grew into cities later, had temples in the middle with farmland surrounded by living quarters, a commercial area and administrative buildings. The Palaces had terraces with planted court yards and there were hunting parks with different kinds of planting which later developed into exotic botanic gardens.

Fig. 1.2
The Hanging Gardens of Babylon
Source; www.geocities.com

In the hot and arid climates of Mesopotamia there developed one of the Seven Wonders of the Ancient World called the 'hanging gardens of Babylon' during the ruling period of the King Nebuchadnezzar II.

These were said to be a mountain-like series of planted terraces built on top of stone arches 23 metres above ground and watered from the Euphrates by a complicated mechanical system. Excavations have found an elaborate tunnel and pulley system that apparently brought water from the ground level to the top terrace.

Egypt had and has a river-centred undulating landscape. Upper Egypt was bound by red and white granite cliffs while middle Egypt was a narrow containment of lime stone. Lower Egypt consisted of flat landscape of the Nile delta. The city building starting from the Nile delta gradually expanded towards the valleys. The Egyptian Kingdom had townships with well planted gardens.

This may have been a pleasant difference from the surrounding desert environment to the people living in these cities.

Egyptian paintings show that symmetry was the most striking feature in these gardens which had rectangular ponds, pergolas and different kinds of fruiting and flowering trees ; and shade was an important factor in these hot climatic conditions.

> "Around many Temples in Ancient Egypt there were sacred lakes or sacred pools. These sacred lakes or pools allowed both the Hem Netjer (Priesthood) and the Shemsu (followers) to attend and perform their religious rites in a state of purity, which was of the utmost importance to the Egyptians. Ornamental trees were planted in front of temples, such as that of Hatshepsut (1573-1458 BC). Entire groves of sycamores and tamarisk trees were found in the grounds of another temple." (www.showcase.netins.net)

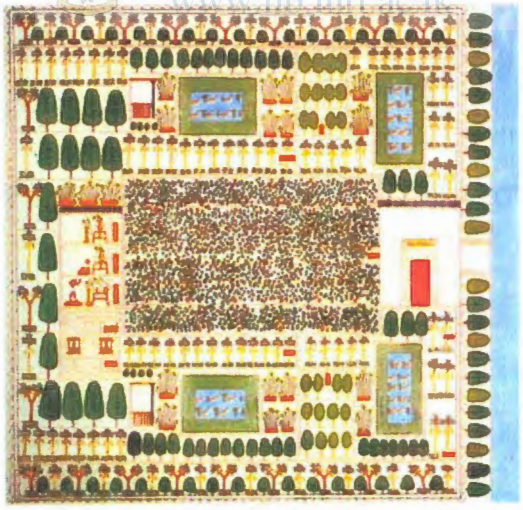

Fig. 1.3
Garden of a high
Official in Egypt
Source; www.gardenvisit.com

The main eastern civilizations too grew within major river valleys. Chinese civilization began along the yellow river valley and then developed inland. China had huge urban complexes which were usually axial in arrangement. These had brightly coloured buildings with massive roofs and long ceremonial

approaches. China had hunting parks which later developed into different kinds of parks in the cities. The landscape designs were closely associated with nature and the Confucian discipline and the influence of Buddhism had great effect on the town planning and association with trees and green spaces in cities. Lakes, rivers and rocks were incorporated into the gardens which mostly had a disciplined character.

A fairly extensive and centralized town planning system is suggested by the layout of the Indus Valley civilization's cities of Mohenjodaro and Harappa.

> "They had large and complex hill citadels, housing palaces, granaries and baths that were probably used for sacred rituals. Beyond the citadels there were well planned towns laid out in rectangular patterns."(www.answers.com).

The gardens of India play a major role in the great epics of India 'Mahabharatha' and 'Ramayana'. There were formal gardens surrounding civic buildings and informal gardens based on forest clearings. The 'Vrukshaurveda' mentions about 64 'kalas' including construction and maintenance of gardens. The Buddhist text 'Lalithavisthara' mentions 500 gardens around the city 'Kapilawasthupura' laid out for Prince Siddhartha. The royal gardens were later opened to the public and some were converted into monastic complexes. According to the texts the Indus civilization can be seen as the major civilization that had a close relationship with green spaces.

1.2 Ancient Sri Lankan Urban Green Spaces and Attitudes

In the prehistoric settlements of Sri Lanka, the manmade environment and the landscape was dominated by the village tank or the 'wewa'. In all these village settlements sufficient forest cover was left behind and protected as the catchment-area of the tank. The villages had more greenery surrounding them in

the form of natural forest cover or the cultivated paddy fields. The most uncultivable areas were used for building the houses.

There were settlements which possessed many attributes of urban life in Ancient Ceylon thousands of years ago. Ancient cities like Anuradhapura, Polonnaruwa, Yapahuwa, and Kandy were large settlements, widely distributed over the country with communal defenses containing streets buildings and city walls. They varied considerably in size, siting and the nature of their defenses, but acted as religious and administrative centers. Sri Lanka has an urban landscape history of about 2000 years. Cities like Anuradhapura, Polonnaruwa and Sigiriya exhibit a series of parks and gardens in the urban plans.

> "Establishment of Royal Parks within the city and in suburbs was a common practice in ancient town planning. The great chronicle of the Sinhalese, The Mahavamsa, provided descriptions of laying out royal parks. King Mutasiva(307-247 BC) laid out the beautiful Mahameghavana gardens rich in all the good qualities that its name promises and provided with fruit trees and flowering trees. Mahavamsa gives further reference to another royal park 'Nandana Gardens' a pleasant place to rest." (De Silva, N. 1996)

Early Sri Lankan urban green spaces embodied a sublime combination of geometry with the natural and organic context.

> "In the ancient city planning and urban landscape tradition of Sri Lanka, it is possible to identify the planning principles adopted in creating a built environment while integrating and enhancing the aesthetics of nature in creating an architectural landscape embracing the natural elements and vegetation. The Fortified garden city of Sigiriya, Badalattali Nuwara, Galabedda in Ruhuna, Polonnaruwa and Kandy are considered as good examples to identify landcsape principles adopted in city planning." (De Silva, N. 1996)

1.2.1 Anuradhapura & Polonnaruwa

Anuradhapura was the capital city of Sri Lanka for a period of more than thousand years. The origin of Anuradhapura goes back to the 3rd century BC. Earlier settlements consisted of small agricultural communities fed by reservoirs. The developed city had a city center and the Buddhist viharas in the periphery. These were surrounded by the tanks; Tissa wewa, Basawakkulama, Bulankulama, Puliyankulama and Nuwara wewa. In between these developments there were several gardens like Mahameuna uyana, Ranmasu uyana, Nandana uyana etc. and there is evidence that all the temple land and the surroundings of the tanks were planted with trees which may have contributed in keeping the dry zone city cool and comfortable.

Fig. 1.4 Anuradhapura – part of Ranmasu Uyana
Source; www.lanka.info

Fig. 1.5 Anuradhapura – The Luscious green surrounding the Pagodas
Source; www.web.pdx.edu

There were four gateways to the city of Anuradhapura and planted banyan trees along them. It is believed that there were structures built on the Banyan trees to worship the trees. A special occasion where tree planting and honouring trees was when, a branch of the sacred Bodhi was brought to Sri Lanka and established in Anuradhapura and is been looked after and worshipped to the present day.

'Chulawamsa' notes that in Polonnaruwa, the gardens of King Parakramabahu, Nandana Uyana and the Dipuyyana had many types of fruiting and flowering trees and these were watered through channels. Among the trees there were many ponds of different forms and sizes filled with water for bathing and other pleasure activities. It is also said that these gardens had small pavilions to relax, with beautifully designed path ways and water filled ponds, shaded with systematically planted trees.

Fig. 1.6
Polonnaruwa – Beautifully laid out gardens
Source;www.asiatravelling.net

> "In reference to medicine, there were many silpa texts written on treatments to different ailments of man, elephants, cattle and also to trees and plants. The latter was identified as 'Vrukshayurvedha'. Further the science and art in establishment and maintenance of gardens and parks in relation to architecture and town planning were highly established. In many of the major 'silpa' texts with multi disciplinary coverage, some of the chapters were confined to the art and science on different aspects of gardens, parks, horticulture etc." (De Silva, N. 1996)

These documents show the understanding, knowledge and traditional approach towards trees, parks and related activities. In the traditional approach, values and status have been accorded different types of trees and also their influence on people.

1.2.2 Sigiriya

"City planning with great emphasis on architectural landscaping was a common practice in Sri Lanka. Among these historic cities, the 5th century fortified city of Sigiriya is considered the best preserved early landscape city not only in Sri Lanka but in the whole world. Sigiriya was a city designed on a rectangular plan form, in the proportions of approximately 1:2 with the long axis in East-West direction bounded by well designed structures for defense with two sets of wide moats and high city walls." (De Silva, N. 1996)

All the elements in the landscape are arranged in a symmetrical way in a grid and the special feature here is the integration of natural elements and levels into the symmetrical pattern blending these together bringing out the best of the site. Taking the remaining elements into consideration one can assume that the whole city was filled with green spaces cooling the harsh dry zone climate.

"The city had been designed with specific land use in mind. The summit of the rock was confined to the royal residences and related service buildings, Western slope of the rock, for administrative and public oriented service buildings.

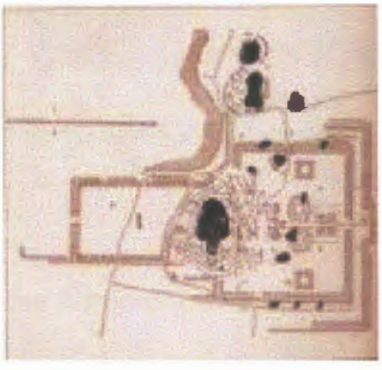

Fig. 1.7 Sigiriya – Layout of the Entire Landscape
Source;
www.internettrash.com

The summit of the rock has many brick built secular buildings, on man made terraces with retaining walls, paved platforms, flights of steps, ponds and open garden area around buildings creating a beautiful landscape composition. Unfortunately no evidences were found on the plants and trees that were planted in the original landscape, but the existing trees and grass indicate the possibility of growing trees on the summit.

Fig. 1.8 Sigiriya Rock amongst the green terrain
Source;
www.tourismasia.net

The lower terrace as laid out on a grid pattern and designed with an axial symmetry creating a symmetrical plan with 'L' shaped and linear ponds on either side of the central pathway. Because of the extensive use of water and the number of ponds, both shallow and deep with flowing water and fountains the scholars have denoted this area as the water gardens of Sigiriya. The availability of archaeological evidence such as base stones with column sockets placed on a grid, and bases and plinths of buildings brought a clear indication of having many pavilions and buildings in association with these ponds and the layout creating a beautifully landscaped environment. Undoubtedly these gardens

Fig. 1.9 Sigiriya – Symmetrical Pathways
Source; www.7is7.com

would have been covered with shady groves of flowering and fruit trees." (De Silva, N. 1996)

1.3 Urban Green Spaces in Latter Kingdoms of Sri Lanka

1.3.1 Sri Jayawardenapura Kotte

Kotte (meaning 'Fortress') was the capital of the ancient kingdom of Kotte from the 14th to the 16th centuries. Situated in a marshland, it was founded on the banks of the Diyawanna Oya river as a fortress against invasions from the Jaffna Kingdom of Arya Chakaravarthi in the 13th century

Kotte was a *jala durgha* (water fortress), in the shape of a triangle, with the Diyawanna Oya marshes forming two long sides; along the shorter third (land) side a large moat (the 'inner moat') was dug.

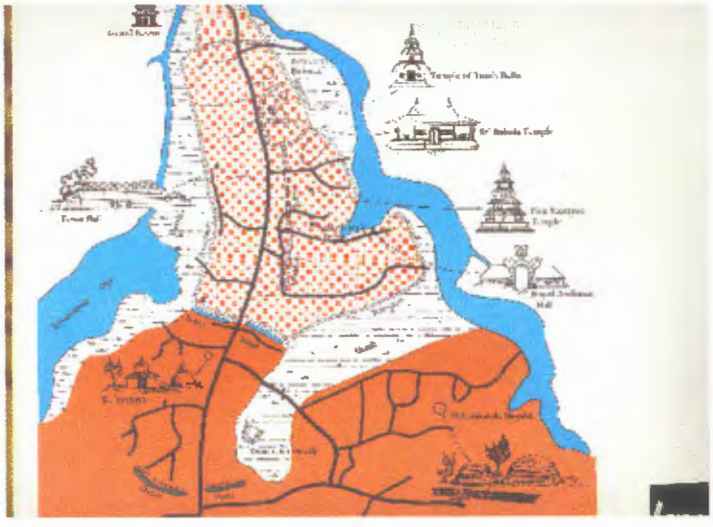

Fig. 1.10
Jayawardenapura Historical City
Source;
Sri Lankas New Capital -Sri Jaryawardenapura -UDA

Being in a marsh itself made it a city surrounded with green spaces and in the hilly area the main city was located, the buildings were in a scattered solid and void arraangement, the void covered with greenery.

1.3.1 Kandy

Kandy, being in the hilly area of Sri Lanka has a different kind of terrain from the other capital cities. Even though the setting is different the city has the typical characteristics of a Sri Lankan capital; forest areas, scattered organic arrangement of bult mass yet being very formal at some situations and water bodies for agriculture and protection from enemy. Kandy, called Mahanuwara or Senkadagala, the hill capital of Sri Lanka, had been the last stronghold of an indigenous monarchy, before it fell into the hands of the British in 1815.

Although the city's history dates back to the 5th century B.C., it did not become the capital of the Sinhala kings until 1592, during a troubled time when many of the islanders were fleeing to the interior, away from the coastal areas which were under European colonial rule.

Fig. 1.11 Kandy – Temple of the Tooth Relic – in the background is the Udawatta kelle
Source –www.sacred-destinations.com

Although invaded briefly several times: by the Portuguese in 16th cent and the Dutch in 18th century, the city remained one of the bastions of Sinhala independence until 14 February 1815, and the last king of Sri Lanka was exiled to India.'(www.mablanka.lk)

"To prevent invasions from the kingdom of Kotte in the west of the country which was occupied by the Dutch, Kandy being the hill capital, was founded on a low lying ground besides a river, overlooked by nearby hills, and often hidden within a wooded surrounding that occupied a large area. Ample water and high security of its location in a hilly environment, and river Mahaweli on its west, north and east made it is a successful capital and a unique place. The natural setting confined the city's horizontal growth and shaped it into a triangular basin.

Fig. 1.12 Kandy – The small island in the middle of the lake.
Source –webshots.com

Fig. 1.13 Kandy – Plan showing green areas in surroundings
Source –www.stonehouselodge.com

The city rises to an altitude of 600m from mean sea level and drops to a basin surrounded with hills on one side and a river on the other. Ultimately, incorporated with a forest reserve and a man-made lake, it gained a more naturalized setting.

As hilltops were major defensive attractions for the town builders, the Palace of Tooth Relic and its circumscribing elements were laid parallel to the hilly forest reserve taking it as a backdrop to the total complex. In keeping with cosmological notions the temple faced west; and it was so sited that there were no buildings to its east – a principle emphasized by

royal edicts which designated the hillside jungle into a reserved forest where no cultivation what so ever permitted." (Mandawala, P.B, www.law.kyushu-u.ac.jp)

Kandy's immediate surroundings contain a wealth of structures and spaces and compositions no less impressive than those in other parts of the world. Its streets belong to the city grid, closely packed houses, open spaces, green spaces and all other related elements gathered there to tell one story. The city of Kandy, features the most sacred of all Buddhist shrines - the Temple of the Tooth or the 'Dalada Maligawa'. The main natural attraction of the city of Kandy is the lake which is surrounded by greenery. 'Udawaththa kele' is situated adjacent to the temple of the tooth relic and is being maintained as a forest reserve up to date.

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CHAPTER TWO:

COLOMBO AS A GREEN CITY

CHAPTER 2:

COLOMBO AS A GREEN CITY

Apart from the invasions of the Cholas during the period of early kingdoms, Sri Lanka was invaded first by the Portuguese. In 1505 Don Lourenço de Almeida, son of the Portuguese viceroy in India, was forced to dock at Galle due to stormy weather. The king later gave the Portuguese permission to build a residence in Colombo for trade purposes.

The Portuguese soon decided that the island, which they called Cilao, possessed a strategic advantage in increasing their control of sea - borne trade and successfully obtained permission to rebuild the fort at Colombo on a grandeur scale.

The Dutch became involved in the politics of the Indian Ocean in the beginning of the seventeenth century. With the consent of King Rajasinghe II, the Dutch expelled the Portuguese and captured the eastern ports of Trincomalee and Batticaloa in 1639 and restored them to the Sinhalese. They captured Galle in 1620 and Negombo in 1640. Their next target was Colombo and they placed it under their regime from 1656.

The British captured Colombo in 1796 but it was not until 1815 that it became the capital city of the whole island. When the British came to control the whole island after 1815 they established a quite distinctive imprint on the island's society and economy. This was most obvious in the introduction of plantation agriculture.

Fig.2.1 Galle Fort with Dutch Buildings. Source – www.cricketclub.org

The name *Colombo*, first introduced by the Portuguese in 1505, was derived from the classical Sinhalese name *Kolon thota*, meaning "port on the river Kelani". It has also been suggested that the name may be derived from the Sinhalese name *Kola-amba-thota* which means "harbor with leafy mango trees". This hints at having green areas or planted areas in the busiest of places even during the early periods.

Fig.2.2 York Street – Fort - 1910.
Source – Liyanage T.N.K.R.-Dissertation

Fig.2.3 Grand Oriental Hotel – This magnificent large tree is not there anymore
Source – www.imagesofceylon.com

Fig.2.4 Galle Face Hotel – With a grove of Coconut Trees
Source – www.imagesofceylon.com

Fig.2.5 Pettah in the early19th century– a cluster of haphazard development now.
Source – Liyanage T.N.K.R.-Dissertation

2.1 Planning and Design in the Colonial Period

The architecture and the approach to having green spaces differed during different periods of colonialism. The climate and prevailing weather conditions may have generated responses that altered the specific architectural expression of Colonial buildings and surroundings. Local craftsmen and women were often employed in the construction and decoration of buildings erected by Colonial regimes. This may have contributed to the local artistic and craft traditions and expressions being often added to the buildings or intertwined into the decoration.

2.1.1 The Portuguese

The Portuguese were mainly concerned about keeping the trade activities thriving under themselves and did not have much time to plan and build our cities. The houses they built had no front yards and were open directly to the streets. Even though it was the case, Portuguese brought in some plants such as bread fruit (*Artocarpus nobilis)* and these were incorporated into their backyards used as service entrances.

2.1.2 The Dutch

The Hollanders left a lasting impression in the field of architecture. Dutch period buildings still survive in Colombo, Galle and Matara, bearing ample testimony to the fine tastes and aesthetic sense of the Hollander. Many of these buildings were evidently designed after the manner of the townhouses of metropolitan Holland which reminded the Dutch colonialists of their beloved homeland.

It is believed that the Beira Lake in Colombo probably takes its name from De Beer who is believed to have been an engineer in charge of the Dutch water defenses.

"There is an old Dutch sluice which controlled the flow of water from the lake and an old plaque under that contains the name of De Beer." (www.lankalibrary.com).

The Dutch had an architecture of a different style from the Portuguese and had gardens surrounding their buildings. They are the pioneers in planting cinnamon and coconuts in the area. The 'Cinnamon Gardens' (Kurunduwatta) area has been named due to the abundance of cinnamon plantations found in the area accordingly.

2.1.3 The British

At the time Sri Lanka went under the British Monarchy the British had the experience of the Industrial Revolution behind them and were more knowledgeable about having planted areas in cities. With this knowledge and taken up by the lush green surroundings of the City of Colombo, they planned and wanted Colombo to be 'a Garden City'.

Fig.2.6 Colombo Harbor at British Times
Source - www.info.lk

The British had experienced the consequences of Industrialization. They were aware of the ups and downs of urbanization, environmental pollution due to industrialization and so on. This may have contributed to the fact the British period architectural creations have more expansive gardens enhancing the beauty of

Fig.2.7 Royal Hotel Colombo 1860
Source – www.imagesofceylon.com

their designs, but such compositions were also a statement of power & authority.

In concert with the British Regime in Sri Lanka a new concept in city planning called the Garden City concept was introduced in England by Ebenezer Howard. The Garden City concept of Howard in 1898 was first published as a book called, 'Tomorrow: a Peaceful Path to Real Reform' and then re-issued as 'Garden Cities of Tomorrow' in 1902. By 1900 several Garden cities had been begun. This concept perhaps influenced and was adapted in the planning of the city of Colombo during the late period of British Colonialism and was promoted by the pioneer modern town planner Sir Patric Geddes.

Several types of urban development with green and open spaces have been discussed in Howard's book and the following are some definitions of them.

2.1.3.1 Garden City

A Garden City is a town designed for healthy living and industry; of a size that makes possible a full measure of social life, but not larger; surrounded by a rural belt; the whole of the land being in public ownership or held in trust for the community.

This promotes the characteristics of a self sufficient society where most of the needs of the human population are considered.

2.1.3.2 Garden Village

The term Garden Village has been used for a small settlement containing a factory and an associated openly planned housing estate; it should not however be used generically for such settlements if in a suburban situation.

2.1.3.3 Satellite Town

Describes a well planned industrial suburb, serving a garden city or country town, at a moderate distance from a large city, but physically separated from that city by a country belt.

In Sri Lanka cities like Ratmalana and Homagama have some of the characteristics of Satellite towns but lack the planned rural country belt and the green areas inside the towns.

2.1.3.4 Country Belt, Agricultural Belt, Rural Belt

They describe a stretch of countryside around and between towns, separating each from the others, predominantly permanent farmland and parkland, whether or not such land is in the ownership of a town authority.

2.1.3.5 Green Belt

Used as a further synonym for country belt, this term has also been applied, thus far confusingly to a narrow strip of parkland more or less encircling part of a built up metropolitan or large urban area. Park belt is a better name for such a strip of the land in question has little or no agricultural uses.

In the Colombo city park belts or green belts close to built up areas can be seen in some places but these are in a more fragmented state than in belts.

2.1.3.6 Decentralization

Till recently advocates of the Garden city idea have used decentralization as the key-word for the planned movement of people and work places from congested urban areas to detached smaller towns.

Howard was a pioneer in introducing modern city planning concepts. His main aim was to outline the nature of a balanced and organized community. The cities were over congested with slums, were spread too much so that the transportation of goods and people were costing huge amounts of energy, time and money. Howard's city was not a loose sprawl of houses and gardens and open spaces but a confined grouping of all the necessities and open spaces.

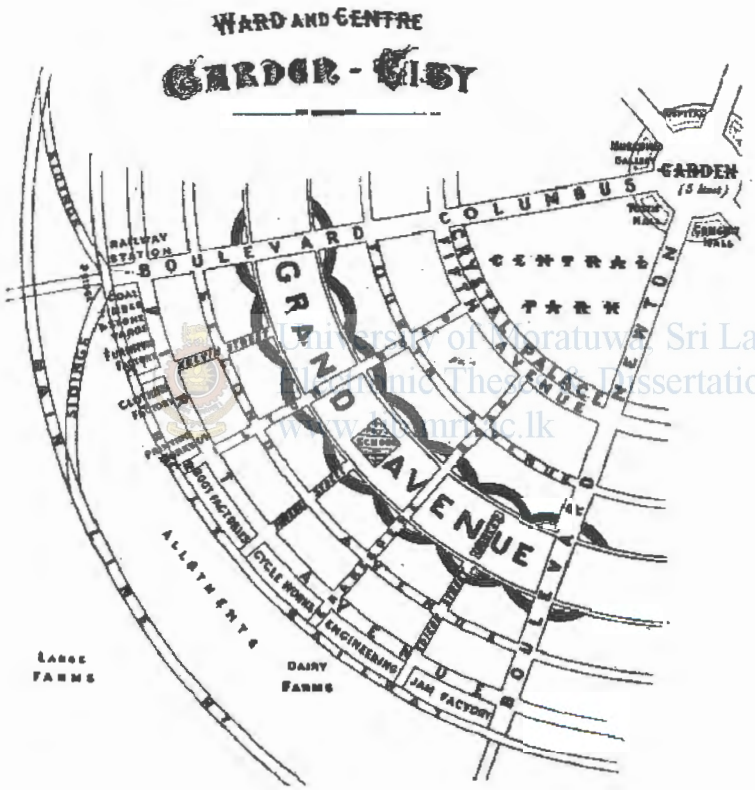

Fig.2.8 Diagrammatic representation of Howard's Proposal – Source – www.libray.cornell.edu

'Of the total tract to be included in the domain of the garden city, one thousand acres, at the centre, were to be occupied by the city itself; and five thousand acres formed an agricultural green belt. Thirty thousand people were to live on those thousand acres. Parks were provided within the garden city on the basis of a little more than nine acres per thousand' (Howard, Ebenezer, 1946).

2.2 Evolution of Colombo's Green Spaces

There have been many instances where plans for developing the city of Colombo were prepared. In these plans there are proposals to revitalize the city in several ways. While promoting Colombo as the commercial capital of Sri Lanka, measures were introduced to increase living standards of the city dwellers, one of them being the increasing of open spaces for outdoor recreational activities.

2.2.1 Patrick Geddes Plan

The first prominent proposal for the development of Colombo was brought forward by Sir Patrick Geddes.

> "Physical plans have been prepared for Colombo since colonial times. The first attempt was by Sir Patrick Geddes in 1921, confining the planning area to Colombo City boundaries. The main concept of the plan was to make the city of Colombo "The Garden City of the East". The tree lined streets (Bauddhaloka Mawatha) and the grid system of roads in Cinnamon gardens are legacies of the Geddes Plan which still provide the most sought after residential areas in the city"(City of Colombo Development Plan – Volume 1 -1999)

The City Grid of Colombo still exhibits to some extent the frame work of Howard's proposal, which in turn suggests that Patrick Geddes was influenced by the proposal of Ebenezer Howard's 'Garden City'.

Having a resemblance to Patrick Geddes Plan, Colombo shows a central garden area with the town hall, art gallery, public library and hospital in the surroundings. Ananda Coomarswami Mawatha run through the centre having an axial grid pattern of avenues from the centre. The residential area surrounds the city core area and to the periphery thyere exists the industrial zone and then the agricultural belt.

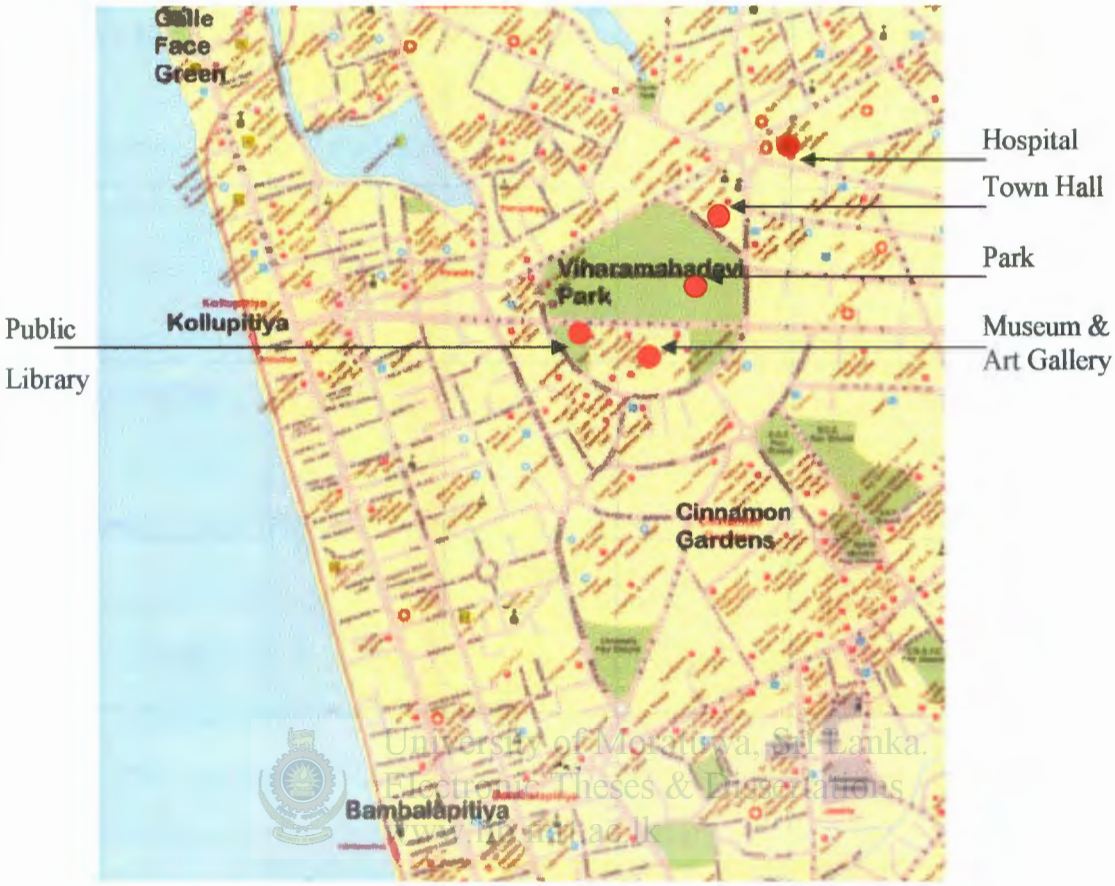

Fig. 2.9 Map of Colombo showing the close resemblance to Howard's Plan- with important places. Source:www.withanage.tripod.com

2.2.2 Abercrombie Plan

The Abercrombie plan for Colombo also has the characteristics of Howard's proposals. It mainly focuses on decentralization and as an answer it introduces satellite towns.

> "In 1948 Patrick Abercrombie developed a plan which was approved by the Central Planning Commission in March 1949. The Plan focused on the city of Colombo and the surrounding region covering nearly 220 sq miles which extended up to Ja-ela in the North, Moratuwa on the South and 14 miles inland to the east. The main problems highligthted in the Abercrombie Plan

were the high concentration of economic, trade and port related activities in the city and their effects. Decentralization of activities is one of the main objectives of the Plan. The introduction of the 'Satellite Towns' in Ratmalana, Homagama and Ragama were based on the proposal made in the plan." (City of Colombo Development Plan – Volume 1 -1999)

The decentralization affects the limit of congestion in the main city and this facilitates having more green spaces in the cities.

2.2.3 Colombo Master Plan Project

The Colombo Master Plan Project by the UNDP in 1978 pursued a balanced regional development strategy covering Colombo, Gampaha and Kaluthara Districts. Planning unit was divided into central sub region and outer urban cluster. The strategy of balanced spatial development failed and instead of the planned accelerated development considering all the aspects, unrestricted urban sprawl continued at a rapid rate and Colombo city area expanded beyond its expected limits defined in the Plan.

2.2.4 City of Colombo Development Plan

In 1985 Urban Development Authority (UDA) prepared the City of Colombo Development Plan and gazetted it as a document of guide lines in zoning and building regulations. The plan emphasizes on the importance of planted areas and minimizing environmental pollution.

"The development that has taken place during the last twenty years has significantly changed the urban environment in and around Colombo. This development has brought positive changes such as economic

diversification, new employment opportunities and better infrastructure facilities as well as negative outcomes such as environmental pollution and congestion." (City of Colombo Development Plan – Volume 1 -1999)

2.2.5 Colombo Metropolitan Regional Structure Plan (CMRSP)

In 1996 when UDA started revising the Colombo Master Plan (CMP) the physical environment and the socioeconomic factors have changed drastically from 1979. The idea of revising the CMP was abandoned and a new plan was prepared for the entire Western Province. It was decided that a framework based on the ecological and environmental factors should be the basic framework for the future physical structure for the CMR. The CMRSP addresses the green space issue in its 'Green Finger Concept'.

2.2.6 A Public Outdoor Recreation Spaces (PORS) Plan for Colombo

The PORS Plan for Colombo recommends having active and passive outdoor recreation and where possible indoor recreation facilities, Natural and Cultural Amenity Precipitants such as view points and special landscape features and sites, a hierarchy of parks facilitating the space requirement criteria combined with 'nesting' concept of special planning, links between nodal parks in the form of linear parks and road and foot path access to the parks. It is stated in the 'Nesting' Concept of the PORS,

'The service area of a higher order park should include the service areas of a number of lower order parks'.

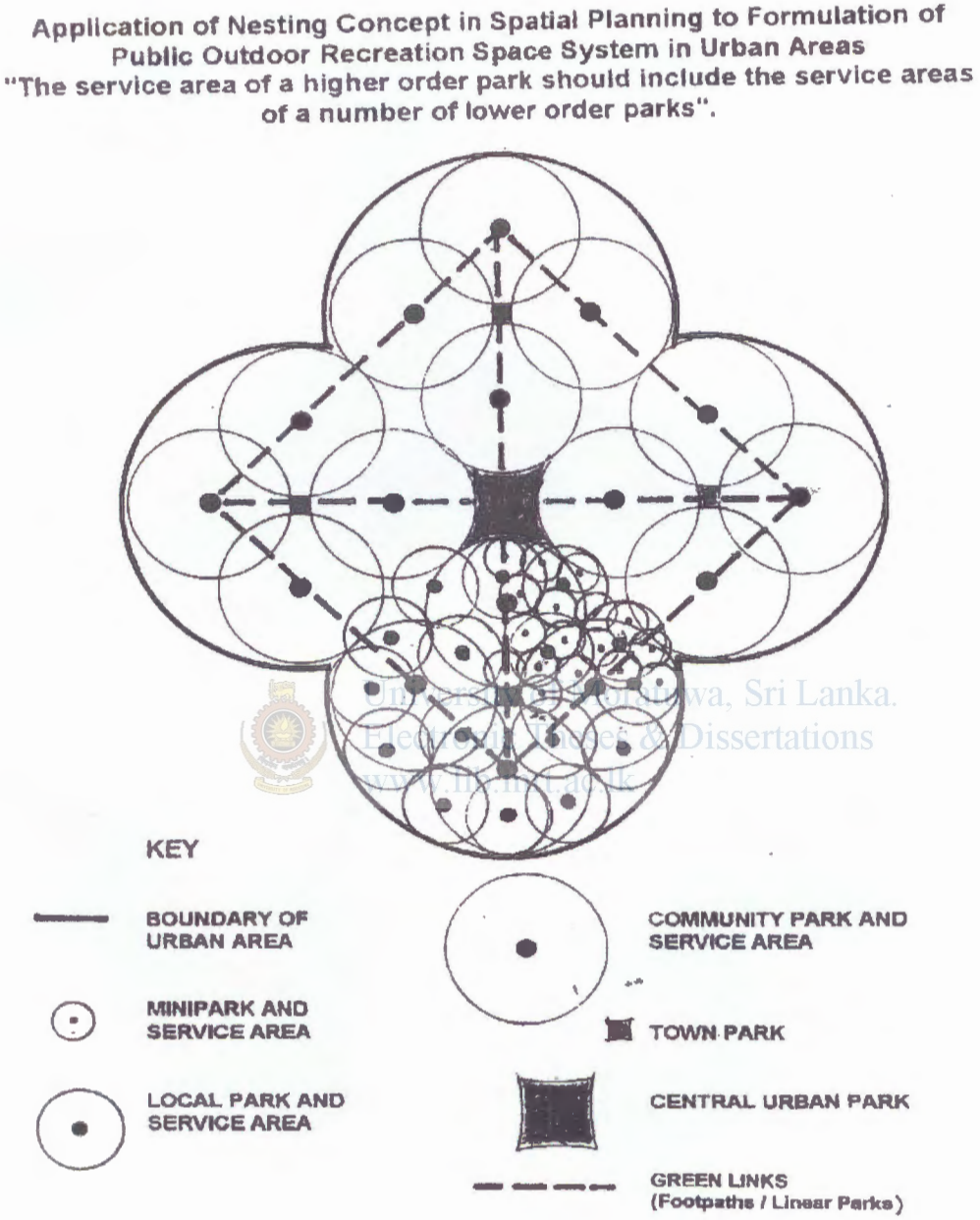

Fig. 2.10 Nesting Concept Introduced in the PORS Plan by the UDA.
Source: Urban PORS plan – UDA-Environment & Landscape Division

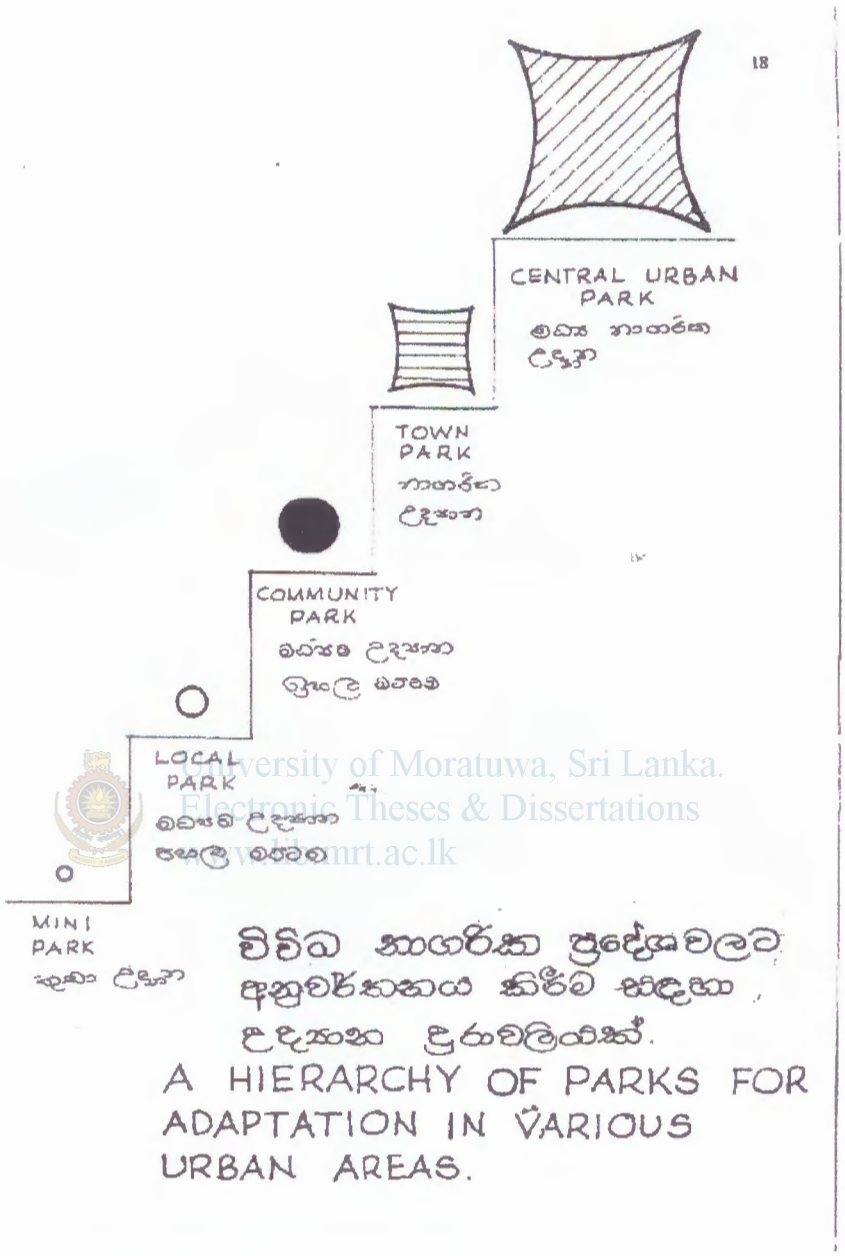

Fig. 2.11 Introduction of a Hierarchy of Parks
Source– Urban PORS plan – UDA-Environment & Landscape Division

When the PORS standard of 1 ha per 1000 population is taken into consideration, it has 635 ha of such spaces in the city of Colombo.

Planning Unit	Estimated Population 2001	Existing Parks (Ha)		Proposed (localised) Parks (Ha)	Proposed linear parks and water bodies
		Public	Other		
1. Fort	17,000	0.6	2.20	2.4	*0.72
2. Kochchikade	76,000	3.25	-	4.3	-
3. Maradana	47,000	-	4.3	4	0.9
4. Kollupitiya	46,000	*11.61	2.20	0.3	*1.98
5. Mattakkuliya	55,000	5.54	-	12.9	7.65
6. Kotahena	33,000	0.3	-	2.3	-
7. Grand pass	51,000	*10.61	-	10.9	2.4
8. Dematagoda	60,000	*10.0	0.7	5.3	2
9. Borella	32,000	5.1	3.1	2.9	0.464
10.Cinnamon garden	34,000	*36.72	14.4	2.1	-
11. Bambalapitiya	41,000	3.0	0.2	7.4	3.0
12. Wellawatta	64,000	5.51	5.4	4.9	11.81
13. Narahenpita	104,000	1.0	1.70	10.6	2.0
14. Kirulapone		2.0	41.4	2.2	5.0

Fig 2.12 Colombo Municipal Council – Existing / Proposed PORS in Relation to population of planning units. Source : Urban PORS plan – UDA-Environment & Landscape

2.3 Legal Frame Work

One who is really interested in having a planned city with adequate green spaces would really be regretful to know that there is no such law in the country relating directly to the green spaces in a city.

The Urban Development Authority Law addresses some aspects relating to Urban Green Spaces under section 8(H) 1 & 2, UDA act of 1982 and this highlights the objectives, the need for recreational spaces and the permitted uses.(See more details in Annexure 1)

The laws that indirectly affect the green spaces are as below,

City Areas - Municipal Council Ordinance – Permission needed for construction of buildings

UDA Act – Colombo and Suburbs – Zoning and Planning is done by UDA and permission is granted by the UDA for constructions and conversions

Coastal Areas - Coast Conservation Act – For constructing in the area 300m inland from high tide zone – permission needed. The only two activities that do not need permission are, cultivation and tree planting.

Sanctuaries – Construction not allowed and tree removal is prohibited in Muthurajawela, Kotte and Bellanwila-Atidiya areas. Private land inside the sanctuaries also need permission for activities but this is not enforced well.

Other Wetlands in Colombo – Land Reclamaton and Development Corporation Act – these are declared as flood detention areas and Narahenpita, Nawala, Heen Ela marshes are protected because of this.

* The Municipal and Urban Councils can maintain their own parks and play grounds – this ha positive and negative effects because they can retain these or may sometimes develop for some other project depending on their regulations.

Reference:

1. ***City of Colombo Development Plan – Volume 1*** (1999) – Urban Development Authority, Ministry of Urban Development, Housing and Construction, Sethsiripaya, Battaramulla, Sri Lanka.
2. Howard, Ebenezer. (1946) - ***Garden Cities of Tomorrow***, Faber and Faber Ltd., 3, Queen Square, London.
3. ***Urban Public Outdoor Recreation Spaces (PORS) Plan for Colombo Municipal Council Area*** (1997), Environment and Landscape Division, Urban Development Authority, Battaramulla.

Web Sites

www.lankalibrary.com

CHAPTER THREE:

PRESENT ISSUES OF GREEN SPACES IN CITY LIFE

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PRESENT ISSUES OF GREEN SPACES IN CITY LIFE

The current situation of green spaces demonstrates a wide variety of problems throughout the world, but also presents a range of opportunities. The urban green situation does differ in different places and the present urban situation needs to be analysed.

3.1 Issues

3.1.1 Population Increase

The world population is increasing and this contributes to the increase of urban population. The urban population is growing at a much faster rate than the population as a whole, and by larger annual increments than ever before. By the early years of the next century, most of the people in the world may live in urban areas. In most developing regions the proportion of people living in the largest cities is also increasing.

> "The world's urban population will grow from 2.86 billion in 2000 to 4.98 billion by 2030, of which high-income countries will account for only 28 million out of the expected increase of 2.12 billion. The world's annual urban growth rate is projected at 1.8 per cent in contrast to the rural growth rate of 0.1 per cent and about 60 per cent of the world's population will live in cities" (UN-HABITAT report, 2004/05).

Parallel to the increase in world population Sri Lankan population also show an upward growth especially in the urban population.

> 'The population distribution by districts and rural and urban residence show slow changes over time. However, the projected urban population indicates that nearly 40 per cent of the population of Sri Lanka will reside in urban areas by the year 2021.

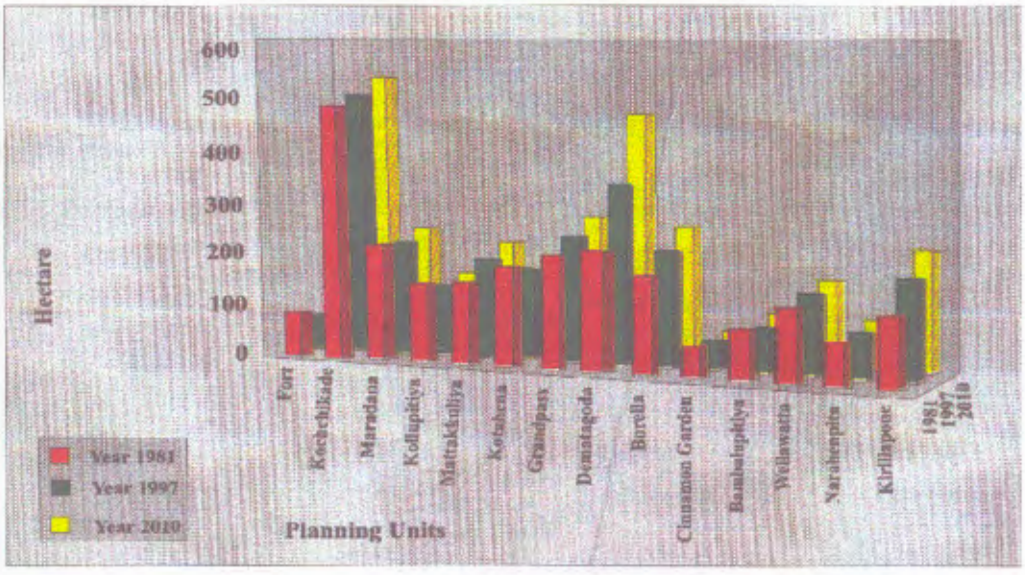
Tables 2, Tables 3 and Figure 1, Figure 2 describe the Population densities, according to the preliminary estimates done in 1994.

Table 2
Population Density by Planning Units of City of Colombo

Name of Planning Units	Population per Hectare		
	Year 1981	Year 1997	Year 2010
Fort	85	70	82
Kochchikade	486	506	536
Maradana	221	222	236
Kollupitiya	147	136	153
Mattakkuliya	159	191	216
Kotahena	188	180	180
Grandpass	218	244	272
Dematagoda	225	343	469
Borella	182	222	256
Cinnamon Garden	51	57	64
Bambalapitiya	99	92	104
Wellawatta	141	152	166
Narahenpita	78	86	97
Kirillapone	129	188	230
Total	**158**	**180**	**208**

Source : UDA and CMC

Figure 1
Population Density by Planning Units of City of Colombo



In 1996, the Colombo City had a net average residential density of 475 persons per Ha., And this average is expected to increase to 709 Persons per Ha. In year 2010.

Fig. 3.1 –Population Density by Planning Units of City of Colombo
Source : City of Colombo Development Plan(1999)

The total population of Sri Lanka is expected to increase from 18.7 million in 1998 to 22.9 million in 2030. While the pre-school, in-school and the youth populations is expected to decline in absolute number, the working age and the old age populations are projected to increase over this period." (Abeykoon, A.T.P.L, 1988)

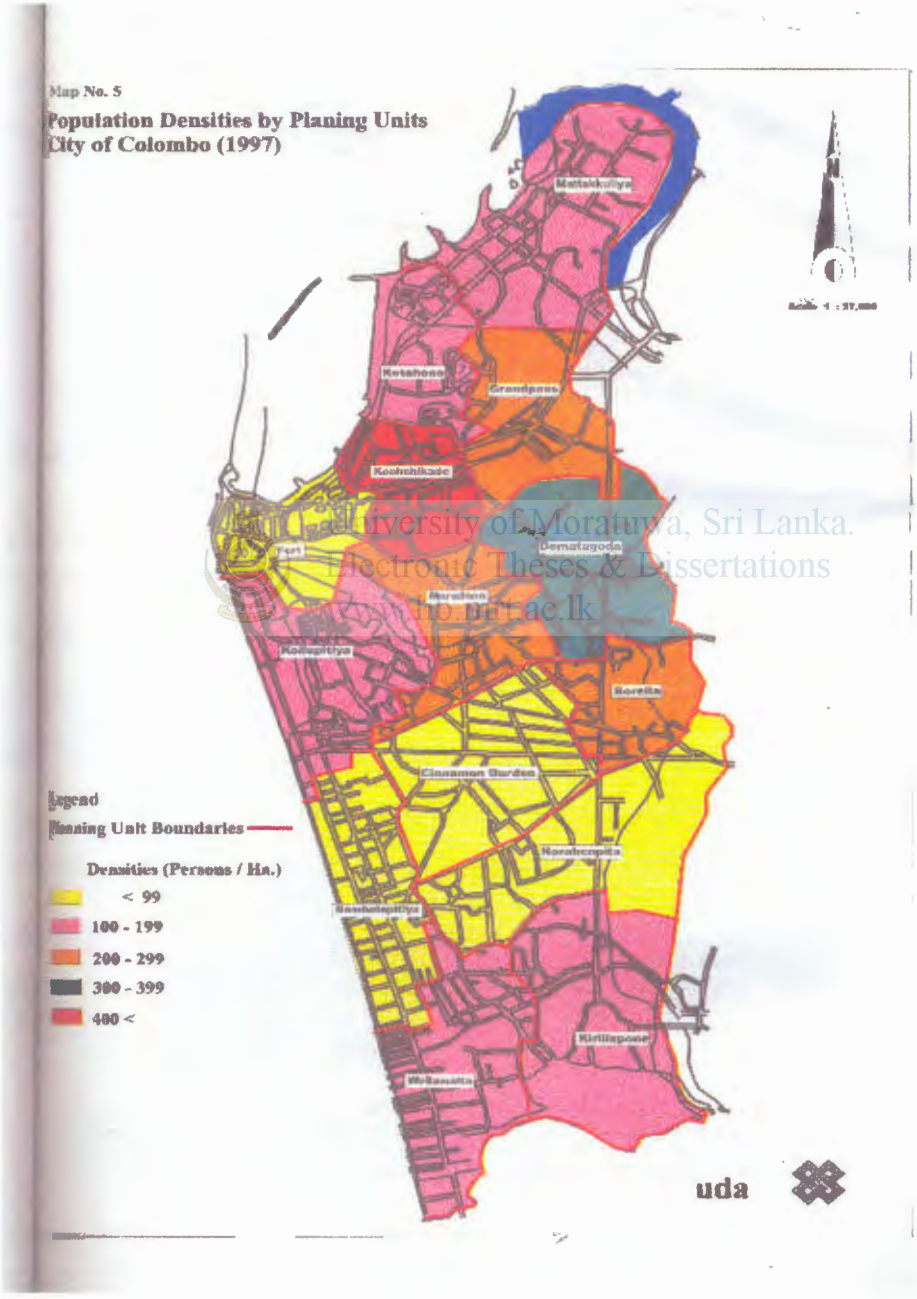


Fig. 3.2 – Population Density by Planning Units of City of Colombo
Source : City of Colombo Development Plan (1999)

Due to the increase in urban population the space available per person decreases, in turn exerting much pressure on the available open and green space. Figure 3.2 shows the population densities in planning units of Colombo. The high density areas automatically have lesser green spaces and that areas are ones that really have the need for green spaces for keeping up with the pressures of environmental pollution. If the expansion of the built up areas keep on improving at this rate the city will one day be a barren land of high air and water pollution, dust filled streets and communities with ill health and stressed life styles.

3.1.2 Urbanization

> The term Urbanization can be described as 'the concentration of people and activities into areas classified as urban' (www.wikipedia.com).

People tend to gather around the facilities such as shopping areas, administrative centres and work places. In Sri Lanka too, many of the Government establishments such as ministries and several departments and shopping centres were concentrated within the Colombo city limits. This increased the grouping of people into the city area. This grouping of people in turn created a demand for more necessities such as housing, recreation, schools, shops etc. and directly and indirectly affected the green spaces in the urban areas.

Fig. 3.3 –Rapidly Urbanising Fort Area of Colombo
Source : www.slgssr2007.org

Fig. 3.4 –Private Development adjacent to Beira Lake
Source : www.srilankatravelinfo.com

3.1.3 Encroachment

Encroachment is a term which implies "advance beyond proper limits", and may have different interpretations depending on the context. In Sri Lanka many of the open spaces, green spaces in cities, river reservations and state owned other land such as railway reservations are being encroached for illegal constructions every year. This has caused a mass scale removal of 'green' from those areas. Unauthorised temporary construction later become permanent specially with the consent of some politians who do not take the negative environmental or social aspects into consideration when the vote is the main consideration.

Fig. 3.5 –Slum Development in a Canal Reservation
Source : www.unhabitat.org

3.1.4 Industrialization

Industrialization is the process of converting to a socioeconomic order in which industry is dominant (www.britannica.com). This was brought about by the much talked about Industrial Revolution started in the late 18th century in England. During that time, an economy based on manual labour was replaced by one dominated by industry and the manufacture of machinery.

It began with the mechanization of the textile industries, the development of iron-making techniques and the increased use of refined coal.

Trade expansion was enabled by the introduction of canals, improved roads and railways. The introduction of steam power (fueled primarily by coal) and powered machinery (mainly in textile manufacturing) brought about dramatic increases in production capacity.

Fig. 3.6 –A Europian City After the Industrial Revolution
Source : ind revo-sustainability.murdoch.edu.

The introduction of more and more machinery, clearing of planted areas for widening the roads and use of fossil fuel for industries and vehicles had a negative impact on the environment, on one side adding hazardous material to the environment and on the other removing the green areas which help to control environmental pollution.

3.2 Outcome of the Pressures

When cities face the pressures of population increase, urbanization and industrialization the outcome will be the decrease of the quality of life of the city dwellers, environmental pollution, ecological imbalance and the overall visual quality and degradation of the city itself.

3.2.1 Physical and Visual Barriers to green spaces

Green spaces, although present in the cities are sometimes screened off by barriers. These barriers are often buildings and hoardings. Often the

construction industry and advertisers do not take the needs or the importance of green spaces around their institutions in to much account. This hampers the visually pleasing appeal of these open and green spaces. Also this hinders the availability and usability of these spaces.

3.2.2 Responding to water bodies

Response to water bodies in the Colombo area is in a very low state. Building to face water bodies is considered as bringing bad luck among some people. Therefore one can observe almost all the houses and many other buildings adjacent to water bodies built with their rear entrances or service entrances facing the water bodies. Although it is the case in Sri Lanka many cities in the world take full advantage of the water bodies around them such as the city of Venice.

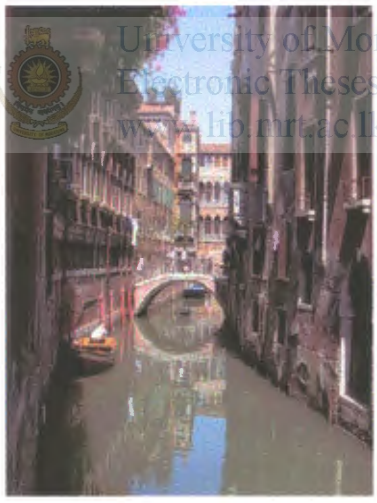


Fig. 3.7 –A Canal in the City of Venice
Source : en.wikipedia.org

The largest fresh water body in the Colombo area; Beira Lake has suffered for many years from the sewer lines entering it polluting the waters that extend to many areas of the core of the city. It shows symptoms of eutrophication. Algal blooms and stench are common experiences in this area due to eutrophication.

"**Eutrophication** is the enrichment of water by nutrients; a lake that is enriched is said to be **eutrophic.** The water in a eutrophic lake is cloudy and usually resembles pea soup because of the presence of vast numbers of algae and cyanobacteria that are supported by the nutrients, depleted of dissolved oxygen because of the high BOD caused by decomposition on the lake floor (lakes.chebucto.org)

The rivers and canal system also faces same fate in the city. Sewage lines enter these water bodies as well as the effluents from industries.

3.2.3 Fragmentation of Land and Higher Building Densities

Although the land values have taken a differential progression upwards, the demand for land has increased. The high demand for land has caused the size of individual slots decreasing furthermore. This fragmentation of land into very small blocks for building purposes has created a very congested environment in the cities.

Architect Ashley de Vos (1991) see it this way.

> "The practices in fashion today will lead us to several problems, for example; the present fragmentation of land, especially the six perch block will go a long way to create slums in our cities- cities where people succumb to and imitate the nesting habits of pigeons- cities where people will be forced to depend on the colours thrown up by a potted plant. This is not a Sri Lankan Landscaped Architectural Environment.
>
> Further the fragmentation into smaller blocks has not only increased land values but has also destroyed the traditional concept of expansion of the dwelling unit with the increase in the family size. With the creation of the smaller blocks the surface area of tarmac within the city has been increased."

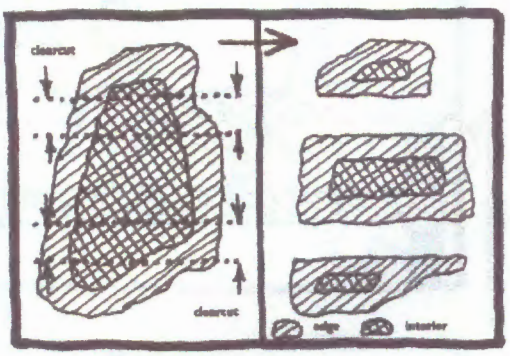


Fig. 3.8 –Loss of Total versus Interior Habitat
Source - *Landscape Ecology Principles in Landscape Architecture and Land-use Planning,*

In some areas there is an increased focus on re-using previously developed land for higher building densities, resulting in pressures on remaining green spaces and, in the worst cases, in the loss of open space. This fragmentation of land causes fragmentation and isolation of habitat for many animal and plant species making them vulnerable to exterior pressures.(Fig 3.8)

'Fragmentation decreases the total amount of a particular habitat type, but proportionally causes a much greater loss of interior habitat.' (Dramstad, W.E., Olson, J.D., Forman, R.T.T., 1996)

3.2.4 Increased Vulnerability to Urban Natural Disasters

During the recent past the city of Colombo has been severely affected by floods. Heavy rains for a very short time have caused a lot of damage within the city limits and the suburbs. The reason for this is partly e the lack of a proper drainage system, increased tarmac and hard built-up area of the city which increases the rate of speed of runoff water which may then collect in the low levels before soaking away or getting drained off into the sea.

The main causes for flooding are heavy rain fall and also the steady and inexorable encroachment of built development over Colombo's wetlands thus reducing their effective role as storm water retention soakaways.

'The most frequent cause of flooding is heavy rain. Even relatively small flows may cause severe flooding if the channel has become blocked by debris, sediment or overgrown vegetation. Flooding can also occur if a

community's drainage system is inadequate or if there is no place for the local runoff to go.' (www.floodplain.org)

The green spaces may reduce the threat of floods by reducing seepage and slowing down the surface water runoff.

When the green covering of the ground is removed the area becomes more vulnerable to landslides in hilly areas or areas with slopes. The trees slow down the rate at which the water from rains reaches the ground and the speed of it. In the absence of trees the water is readily absorbed into the soil and runs through it making way to landslides.

During the past few years we have been discussing about the tsunami disaster and it was obvious, the beaches with planted area suffered much less than the bare beaches and also this applies to natural disasters such as cyclones too. Coastal or inland wind belts help to protect the area from the adverse effects of the ruthless winds.

3.2.5 Industrial and Vehicular emissions

With the industrial revolution the development of industries and machinery has brought in the new problem of industrial and vehicular emissions. Burning of fossil fuels and coal is the main form of energy generation for the industries and the vehicles and this emits gases that have a negative impact on the environment when they are in high concentrations than the norm.

Fig. 3.9 –Colombo City at British Times
Source – www.info.lk

Fig. 3.10–Now situation of a Colombo Street
Source – www.SriLankatravelguide.com

Figures 3.2 and 3.4 shows how the use of engine powered machinery has been increased as transportation media up to the present.

These gases called green house gases are said to be responsible for a phenomenon called the green house effect [1]. Development of industries has contributed to deforestation and this too has an impact on the environment since trees are the agents that act as buffers maintaining the equilibrium.

Use of chlorofluorocarbons (CFCs) in refrigeration systems, and use of CFCs and halons in fire suppression systems, manufacturing processes and in aerosols such as pressurised perfumes also contribute to global warming.

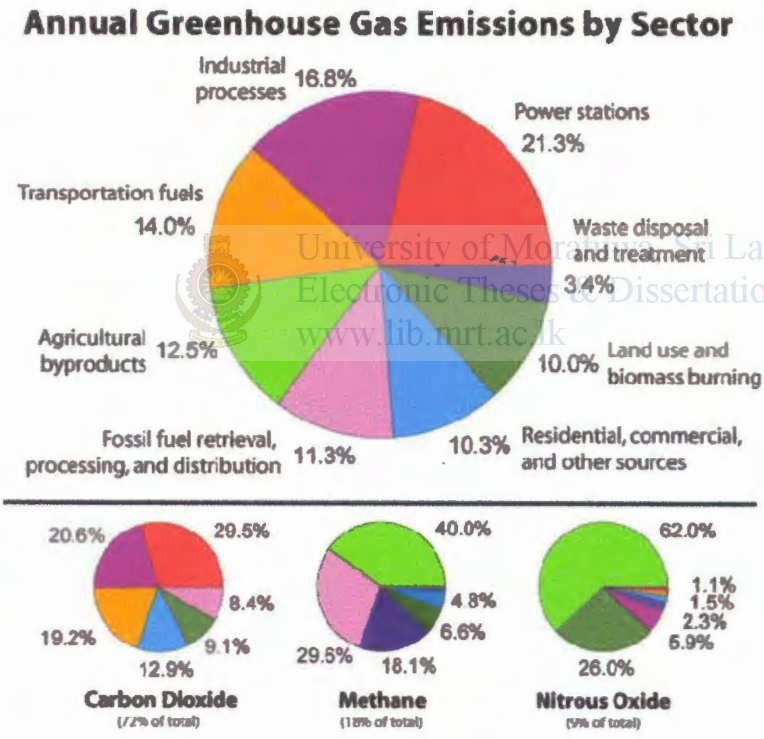


Fig. 3.10–Annual Green House Gas Emissions by Sector
Source – www.en.wikipedia.org

[1]The greenhouse effect is the rise in temperature that the Earth experiences because certain gases in the atmosphere (water vapor, carbon dioxide, nitrous oxide, and methane, for example) trap energy from the sun. Without these gases, heat would escape back into space and Earth's average temperature would be about 60°F colder. Because of how they warm our world, these gases are referred to as greenhouse gases.

Green House Gases are emitted to the air by various anthropogenic activities.(Fig. 3.10) Addition of industrial effluents to water bodies and soil is another consequence of industrial development.

3.2.6 Urban Microclimate Effects

Urban microclimate effects such as 'Urban Heat Island Effect' are prevalent in many cities; intensities vary from community to community according to such variables as climate, topography and the degree and pattern of urbanisation in a given geographical area. This is caused by several factors such as natural sunshine heating the hard surfaces of buildings and re-emitting it and getting reflected again and again by the hard surfaces and by anthropogenic activities like combustion of fossil fuels and the use of air conditioners.

There are adverse effects of winds entering areas with high risers and getting more momentum against the tall buildings. The force gained by the wind could be cut down by having planted areas in between the buildings.

Although some argue that the tall buildings create the necessary shade and the cooling effect around the tall buildings (Urban Canyon Effect) one could not say planted spaces are not needed in cities taking only these factors into consideration.

3.3 Colombo City Green Spaces

As discussed in chapter two Even though there were plans to develop the City of Colombo and a legal background to foster the correct development strategies, today urban green spaces are rapidly decreasing or deteriorating as they are taken over by encroachments and new developments, threatened by pollution and engulfed by the concrete jungle. These spaces need to be protected and 'redeveloped' to not only continue to provide the social recreational needs and

the valuable ecosystem services, but also as invaluable educational opportunities to generate interest and appreciation for wildlife and biodiversity in general.

3.3.1 Galle Face Green

Originally a Military esplanade, the main attraction in the Colombo 01 area is the Galle face green with its sea front. This area is maintained as a grass area with only a row of large trees along the Galle road and is being used for several functions of varying capacity and social backgrounds. For several years the Independence day celebrations were held here and during every December 31st night musical shows to celebrate the coming year are held. Kite festivals too are held every year along with competitions and International kite shows. Every weekend and during most evenings the Galle Face Green gets filled with people; playing cricket, walking,

flying kites, resting, sight seeing etc. Maintaining the grassed 'green' in the Galle Face Green has been a problem for some time with heavy foot traffic, salt spray, erosion and inadequate maintenance operations.

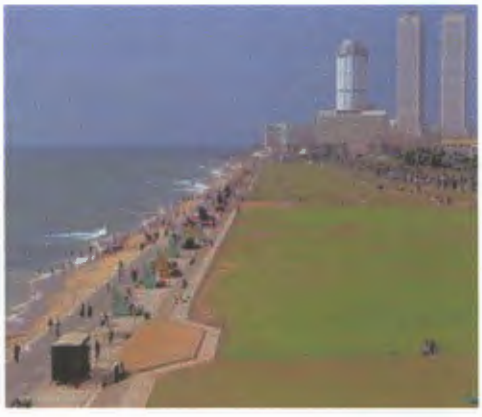


Fig. 3.11–The Galle Face Green
Source – www.travelmaker.nl

Fig. 3.12–The Galle Face Green-a beehive of activity during weekends
Source – www.veenago.com

3.3.2 Viharamahadevi Park

Viharamahadevi Park is situated virtually in the center of the city and reflects the central park area in the Howard's proposal. This, the largest green area in the city center was once a very active place but is in a lethargic state now. Apart from the flower shows held during some week ends in a small part of the park and occasional shows held in the open air theatre, the park is not being used much. One can observe school children on educational trips from outstations coming to have lunch to the park occasionally while some young lovers and beggars are the most frequent site.

Fig. 3.13–A water feature inside Viharamahadevi park
Source – www. srilankatravelguide.com

Fig. 3.14–A vista through the park opening up the town hall
Source – www.srilankatravelguide.com

3.3.3 Beira Lake Surroundings

Beira Lake is a fresh water mass inside the city of Colombo. It is surrounded with high rise buildings in some areas and with slums and warehouses in some areas. Most of the sewage lines in the city had their outlets to the lake causing eutrophication in the lake. The opportunity to see a water body in many instances during a trip around the city is blocked by having ware houses and slums covering the most spectacular views of the lake.

Fig. 3.15–An aerial view of Beira Lake
Source – Urban Development Authority

3.3.4 Streets

Colombo city streets are very busy streets with a high density of vehicles and people moving about each day. Some streets in the Colombo 07 area have street planting. Almost all the other streets, roads and pavements are bare concrete or asphalt areas; one can't even directly look at the ground during the day time due to the glare that is emitted. There is no space in many streets to plant trees some even do not have a proper pavement.

3.3.5 Stadia and Play grounds

There are a number of Stadiums and play grounds within the city limits of Colombo. 'Keththarama' and 'Sugathadasa' out door stadiums in Maligawatta and Kotahena areas respectively are the attraction of the cricket fans during the match seasons. These are also used during the district and all island sports meets every year and were the locations where international sports festivals held in some years. These are run by their board of management and are maintained well, although not up to very high standards.

A number of local playgrounds are situated in different places of the city. Most of these are in a neglected state while some are being used by the youth in the vicinity. The playgrounds and cricket fields that are managed by the sports clubs such as SSC and NCC are in a good state, but the local council managed grounds are the ones that are neglected.

3.3.6 River, Canal and Railway Reservations

Several canals and rivers such as Heen Ela which enters the city in two points and the Kirullapone Canal that runs through the city of Colombo. These canals and rivers are to have a reservation area of a certain width from the bank according to the documents. The situation now is far removed from the original intention. Along the banks of these, unauthorized construction have taken place most of them being slum dwellings of low income groups. It has now become a

practice of some people to build on state owned land and then later demand for alternative places to move to release the land. It is more or less the same situation with the railway reservations. The remaining spaces that are available are not being planted or managed well so that those too are in a vulnerable situation.

3.3.7 Beaches

From north to south along the western border of whole of the city of Colombo there exists the beach. A traveler who enters the Galle road from the Colombo fort area can travel up to the end of the city along costal belt, but only see the ocean when he travels pass the Galle face area. The rest of the entire stretch of beach is covered by buildings. The beaches are accessible through the by lanes and a considerable area of the beach is being built up by private lodge or restaurant owners and planting is limited to existing natural plant cover of Mudu Keiya and Wetakeiya (*Pandanus spp.*) and Mudu Bimthamburu (*Ipomea pescaprae*) at some places and some occasional Thakkada (*Scaeveola spp.*), Gan sooriya (*Thespesia populnea*) and Mudilla (*Barringtonia asiatica*) plants. Management of the beach green spaces is non existent to my knowledge.

Fig. 3.16–Activities taking place in the beach

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CHAPTER FOUR:

TOWARDS GREENER CITIES

CHAPTER 4:

TOWARDS GREENER CITIES

Urban green spaces are crucial elements of all cities. They affect the townscape, provide ecological diversity and form essential structural and functional elements that make cities and urban regions more livable places for their citizens. It is this key role of improving the quality of urban life that has caused many parties to understand the vital importance of urban green spaces. They have ecological functions as well as functions with regard to their relevance for healthy citizens, societal well-being, economic benefits and the central role that they perform in the development and delivery of sustainable ideals.

4.1 Benefits of Urban Green Spaces

The inter-related issues of urban sprawl, traffic congestion, noise, and air pollution are major socio-economic and environmental problems faced by most cities. What makes urban green spaces green is that they are 'living' - and it is this 'more-than-human' interactivity, that is the key to understanding what makes cities habitable.

4.1.1 Ecological and Environmental Benefits:

Urban green space has an important ecological function in its own right. In a city, the presence of open wooded areas, scrubs, urban wetlands, horticulture and agricultural areas represent a mosaic of ecosystems. These complex ecosystems contribute to the bio-geo-chemical cycles in an urban environment.

Green spaces provide habitat for tree species and faunal species which will enhance the biodiversity in a particular area.

Fig.4.1 Bats resting on the trees in the Viharamahadevi Park

As the web site www.savethegarden.com states there are several benefits of a green space.

- Green spaces provide habitat for a variety of birds, fish, animals, insects, and other organisms, while also providing corridors and greenways to link habitats.
- They prevent soil erosion and absorb rainwater, thereby improving drainage.
- Trees have been shown to absorb pollutants; as few as 20 trees can offset the pollution from a car driven 60 miles per day.
- The urban heat island effect occurs often in urbanized areas, where buildings, asphalt, and concrete absorb solar radiation and then re-emit it as heat, causing the air temperature of the city to rise.
- Plants have been shown to reduce the urban heat island effect, directly by shading heat absorbing surfaces, and indirectly through evapotranspirational (ET) cooling.
- In studies, vegetation has been shown to lower wall surface temperatures by 17°C, which led to a reduced air conditioner use by an average of 50% (McPherson, 1994).

- Green spaces can also reduce noise pollution, by dense screens of trees and shrubs, and can even cleanse partially-treated wastewater.
- Finally, green spaces and their inhabitants are a good indicator of overall ecological health of the ecosystem. This is an important measure in judging the ecological sustainability of the community.

Plant species act as pollution controls since they absorb carbon dioxide for photosynthesis and the leaf hairs adsorb the negatively charged dust particles performing a cleaning process of the neighbourhood atmosphere.

'It is clear that vegetation reduces air pollution, but to what level seems to depend on the local situation '(Svensson and Eliasson, 1997).

'The reduction is primarily caused by vegetation filtering pollution and particulates from the air. Filtering capacity increases with more leaf area, and is thus higher for trees than bushes or grassland' (Givoni, 1991).

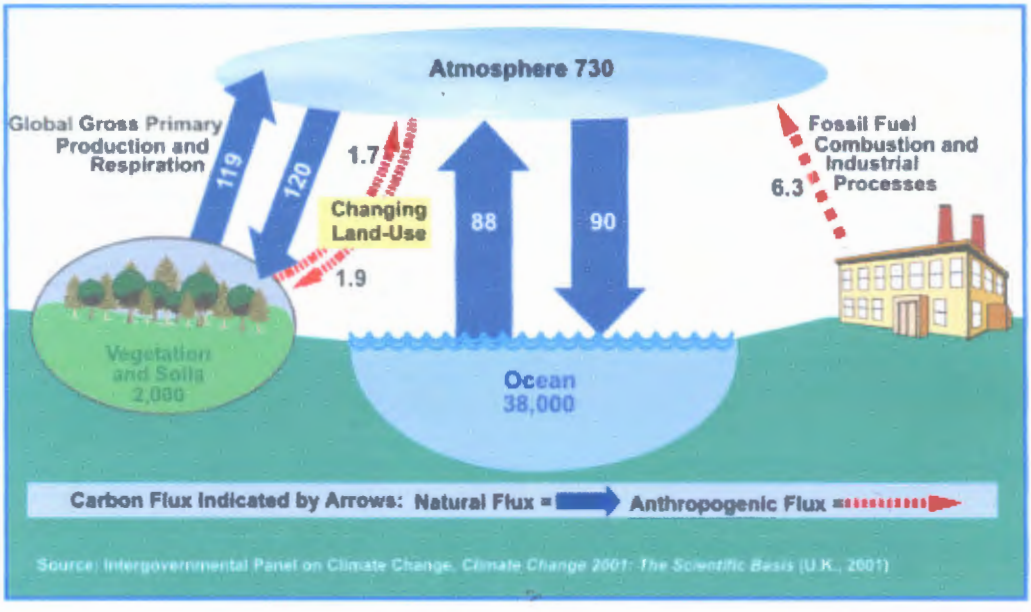

Fig.4.2 Gaseous exchange between the environmental layers

As the URGE project points out in its manual (2004), potential functions and benefits of Urban Green Spaces are as below.

Fig: 4.3 Potential Functions and Benefits of Urban green spaces
Source; Manual – URGE (2004)

As stated in the paragraph below, the green spaces help reduce flooding by controlling the runoff and serve as flood detention areas. Planting perform

another function by reducing the heat buildup in the city areas through shading and physiological activities.

> 'In the case of reforestation and re-vegetation, the rate at which surface water flows to the main channel may be slowed, and hence the runoff is spread over a longer period. In addition, the passage of water tends to be retarded in basins with many natural storage areas, such as lakes and wetlands, and even those with artificially created storage. Consequently, smaller peak flows are produced than in basins without these modifying influences.' (www.ec.gc.ca/water/en/manage/floodgen/e_cause.htm)

Urban green spaces and Nature Parks act as 'green lungs' of the city and its environs offer interesting options to cater to a variety of interests. They are a haven for walkers, joggers and nature lovers. One can enjoy the sounds of nature and rest one's eyes on some greenery.

4.1.2 Social Benefits:

- Provides recreational use: a place to play, meditate, gather, or rest.
- Green spaces give a sense of social place, allow one to gain social recognition, enhance feelings of family kinship and solidarity, allow one to teach and lead others, provide opportunity to reflect on personal and social values, promote spiritual growth, and in general allow users to feel free, independent, and more in control than is possible in a more structured home and work environment.
- Green spaces introduce the natural into the urban environment.
- Green spaces provide a refreshing contrast to the harsh shape, color, and texture of buildings, and stimulate the senses with their simple color, sound, smell, and motions (Dorward, 1990; Miller, 1997).

- Green spaces foster a connection between community residents and the natural environment that surrounds them, thus allowing for a more livable city. This is essential in order for a community to be sustainable.

Green Space is Socially Valuable

- In all walks of life, green space draws people outside and fosters social contact.
- Provides open green spaces where people can congregate and opportunities for positive social interaction and supportive friendly environments.
- Studies have found that residents living near green common spaces "had more social activities and more visitors, knew more about their neighbors, reported their neighbors were more concerned with helping and supporting one another and had stronger feelings of belonging" (Environmental News Network).
- Green spaces promote safer neighborhoods. When residents have more vested interests in a place, their participation in community vigilance increases, and they will watch to make sure it's not being misused, damaged, etc. The better maintained a residence or public space is, the safer it is going to be.
- Natural areas promote livability and vitality of communities. Recreational opportunities, good air and water quality and scenic beauty will attract new residents, families and tourism.
- Green spaces will attract middle class residents to move into areas of the city that may be lower income without practicing gentrification.
- One would like to be surrounded by plant life than by concrete.
- Green spaces attract businesses, create jobs and raise property value.

- It also strengthens social bonds in places where those kinds of ties are so badly needed."

Having Green spaces in the cities is also associated with the health of the citizens. According to Takano, T., Nakamura, K. & Watanabe, M. (2002),

> Evidence from Japan emphasises the vital role that tree-lined streets, parks and other green spaces play in our lives. Not only do they enhance our sense of community and our attachment to a particular neighbourhood – they can even help us live longer. Of more than 3100 people born between 1903-1918 in Tokyo,
> 2211 were still alive by 1992; the probability of their living for a further five years was linked to their ability to take a stroll in local parks and tree-lined streets.

4.2 Future Directions through contribution of green spaces

Although the green spaces in Sri Lankan cities as well as all over the world have suffered enormously during many difficult times, a new concept of restoring, regenerating and introducing new green spaces into the cities is emerging now. This has come to reality in the wake of the total destruction of urban green spaces in many parts of the world. Many countries have identified the multifaceted importance of green spaces in cities and have taken necessary action towards achieving greener cities. Sri Lanka too has started working in the positive direction of conserving and introducing more urban green spaces in its cities, especially the Capital Colombo.

4.2.1 Progress of Colombo

As discussed in the previous chapter the Galle face green has been burdened with the problem of maintaining the 'green'. The Urban Development Authority (UDA) is doing its best to keep up with the demands of maintaining it. Recently a new revitalizing project of the Galle face area has started. The grass area is being re-turfed with salt tolerant grass species while introducing new retaining walls in different sections in different levels, to minimize surface runoff causing erosion, thereby reducing nutrition leaching too.

Beira Lake Restoration Project (1993) is another such project being carried out by the UDA. Under this, a part of the Beira Lake surroundings is developed at present. According to its restoration strategy report,

"The restoration strategy includes,

1. Reduction of pollutant loading from Beira Lake catchment (disconnecting sewer lines, street cleaning etc.)
2. In lake restoration procedures – ex. dredging, filtration of algae
3. Lake /catchment development and management program – land use zoning and management
4. Shoreline beatification and recreational facilities
5. Monitoring program and enforcement

The planning concept of shoreline beautification is - to be one of 'sustainable vegetation' as far as possible, give a distinct impression of luxuriant tropical vegetation, in order to create a local character and to maintain the wetland habitat.

Fig.4.4 The Gangarama Temple premises in the Beira lake
Source – www.tourslanka.com

Fig.4.5 The commercial area silhouetted against the Beira Lake and the sky
Source – www.lankalibrary.com

The Western Region Megapolis Master Plan Project of the UDA (2004) also has identified green spaces in the Colombo city in a separate section called 'Green/Recreation and Tourism Plan' and through a concept called the 'Green Finger Concept' where open space and environmental areas are planned into the Green Connector System to provide relief from the built environment. These will enhance the future of the green spaces and the city life in general in Colombo if implemented accordingly.

Apart from having green spaces in cities there should be management plans for managing those areas strategically. One such management plan put forward by, Ravi Pereira .....describes it this way.

> 'Identification and prioritisation of urban environmental issues was the first step in preparing an environmental management strategy. This stage consisted of describing the extent of environmental degradation, projecting future environmental conditions in Colombo, describing the lack of existing remedial measures, and compiling an inventory and analysis of environmental legislation and institutional arrangements.

> During this process, the following environmental priorities were identified: a) loss of natural resources; b) deteriorating quality of surface and groundwater; c) flooding and stagnation of water courses; d) pollution from solid wastes; e) deteriorating ambient air quality; f) concentrated environmental problems in low-income areas; and g) traffic congestion. These problems were attributed to inadequately planned or controlled urban and industrial growth, lack of pollution control, insufficient or malfunctioning infrastructure and public services, and inadequate institutional and financial capacity for management.'

In the Public Outdoor Recreation Spaces Plan for Colombo Municipal area (1997), it is proposed to improve and realize the full potential of the Beach strip as a linear park and to open up at least a minimum of new spaces where necessary along it. It is also said,

> 'The Kolonnawa North and Heen marsh Colombo Flood Detention areas immediately adjoining the Eastern boundary of the CMC area could serve as 'Nature parks' while the Beira lake could be used for water-based recreation and a large part of its verge could be opened for linear parks and a few nodal parks.'

A special project which concentrates on the canal system called the Colombo Canal System Water Quality Improvement Project in 2007, proposed linear park designs for canal embankments in Colombo District. The project activities include,

1. Clearing and cleaning of the canal banks including removal of garbage.
2. Installation of hard landscaping features
3. Installation of soft landscaping features and gives recommendations on park areas.

4.2.1 Examples from the World

In many cities of the world green areas also combine the natural with a rich cultural and manmade heritage including historical monuments or traditional meeting spaces. Urban parks, squares and other public green spaces are immensely important to urban dwellers. They provide an opportunity to spend time out of doors, near their homes or place of work, to connect with the natural world.

'Urban renewal' or bringing back the urban green spaces to its earlier state is a new method of attending to the improvement of urban green spaces in many countries. Some countries who resemble our country in some aspects and others who have successfully brought back their green spaces even though they don't have very much in common with our country are discussed here.

4.2.1.1 Rio de Janeiro

Rio de Janeiro is the second largest city of Brazil and share a geographical resemblance with Colombo in having part of the city very close to the sea level. Vermelha beach and Copacabana beach are two of the cities attractions which have large green stretches along it. The traditional neighborhood located between the historical *Flamengo-Downtown* strip and these beaches is Botafogo. This area with restaurants, shopping complexes etc. is a carefully planned mix of built environment and green spaces.

Fig.4.6 Rio de Janeiro Beach with its large green strip behind
Source – www.yrealestate.net

4.2.1.2 Miami

Miami city redevelopment project is one such project implemented in Florida USA. The redevelopment of the city has a number of goals, (www_miamitwp_org)

1. To create a pedestrian oriented environment within the Town Center.
2. To create a vibrant mixed-use town center.
3. To create a visually appealing Town Center.

The City of Miami Green Commission was developed to establish an environmentally friendly development in the city and to have a strong foundation for environmentalism.

Fig.4.7 A conceptual drawing of the city of Miami.
Source – www_miamitwp_org

According to the Miami Mayor's Official web site (City of Miami - Office of the Mayor.htm) there were a number of policy goals and initiatives.

a) The greening of Miami – Now and in the Future

Under this policy initiative, the Miami Green Commission is working to develop a comprehensive urban forestry strategy to include both short-term and long-term tree plantings.

Aerial and satellite imagery will be used to measure changes in Miami's existing tree canopy, and measure the proportion of canopy cover to grassland, and impervious surfaces (buildings and concrete) and measures will be taken to over come the problems.

b) Increase Green building practices

Buildings consume more energy and pollute more than all facets of urban development. By encouraging green building practices, Miami can work toward reducing its energy consumption, and therefore reducing the overall costs of building operations.

c) Begin green school practices

The overall Green Building strategy addresses all public and private building practices. A proposal for developing green schools has been submitted by a local environmental non-profit organization, Dream-In-Green. The proposal incorporates energy efficient technologies into the city's school's operations which will be complimented with a related environmental curriculum (including assembly presentations) and an energy reducing competition measured by the "green-o-meter."

4.2.1.3 London

London is well endowed with open spaces. Green space in central London consists of five Royal Parks, supplemented by a large number of small garden squares, council squares, green ways and other green spaces scattered throughout the city centre. Open space in the rest of the city is dominated by the remaining three Royal Parks and many other parks and open spaces of a range of sizes.

The planning of long distance routes in London began with County of London Plan by Patrick Abercrombie. He saw a deficiency of open space as one of the four main defects of London and believed it could be remedied by planning green corridors, greenwedges etc.' (www.wikipedia.com)

Fig.4.8 A street in Manchester
Source : w.ww.manchesteronline.co.uk

Fig.4.9 Green Park London
Source: victirian.lang.nago

The city of London has prepared an action plan to conserve the cities green spaces, called the 'City Gardens: Small Public Gardens, Churchyards and Squares Habitat Action Plan. 'According to the web site www.cityoflondon.gov.uk., this is aimed,

- To protect and enhance the biodiversity of the City of London's small public gardens, churchyards and squares.
- To increase awareness of the importance of gardens, churchyards and squares for biodiversity in the City of London.

The concept of a Green Belt around London originated before the Second World War in response to the need to control the outward spread of London.

> In United Kingdom town planning, the **green belt** is a concept for controlling metropolitan growth. The idea is a ring of countryside where urbanisation will be resisted for the foreseeable future, maintaining an area where agriculture, forestry and outdoor leisurecan be expected to prevail. The fundamental aim of gree belt policy is to prevent urban sprawl by keeping land permanently open, and consequently the most important attribute of green belts is their openness.(en.wikipedia.org)

The concept of green belts in controlling the urban sprawl can be adapted in Colombo because here the building is done haphazardly leaving no space for grenery. London wetland centre which is a 43 hectare wetland reserve is a habitat for many bird and other wildlife species. Since Colombo is a low lying area we have many wetland plots which can be used as green spaces without neglecting and filling them for building purposes.

4.2.1.3 Kuala Lumpur

The city of Kuala Lumpur in Malaysia which is a tropical city like Colombo has started an urban green project, since they have identified the presence of heat islands, high noise levels and high incidence of suspended particulate,

atmospheric lead and dust fallout in the city. In 1998 they built the tallest building in Asia on their last remaining area of city centre parkland. This increase of built area may have caused the environmental imbalances which they now face and identify as problems.

They have initiated a work plan to have connections between the relevant organizations, to create an Urban Green Map, have awareness programes, to study the geen spaces, develop a database on green spaces and to study the laws and by - laws governing the conservation and management of green areas so as to ensure that they are adequate in conserving and managing urban green space.(adapted from UMP - Asia Occasional Paper No. 15 - 1995)

Colombo as a city still has many un-built green areas remaining even as small pockets. The examples from other Asian countries should be seriously considered in dealing with the expansion pressures and a plan which we should strictly adhere to must be prepared to maintain our remaining green areas and enhance their effectiveness in connecting them as a network.

Fig.4.10 Kuala Lumpur – Green areas in a dusty polluted city
Source: www.motolium.com

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City of Miami - Office of the Mayor.htm

www_miamitwp_org

CHAPTER FIVE:

THE WAY FORWARD

CHAPTER 5:

THE WAY FORWARD

From the historical periods with the formation of cities, including green spaces in the cities was a part of town planning. As discussed in the first chapter with the beginning of the human civilization man was connected to and dependent upon the surrounding green spaces. When the townships became larger and the requirement for space increased this pushed the green spaces further and further away from the center of the towns. Then came the industrial revolution or a rapid evolution of mechanization of industries and day to day life. Man was so taken up with the idea of new machinery, vehicles, industries and making profits out of them he had neither time nor the intention to look at the landscape or the environment around him.

After some time from the introduction of machinery, and when the industries were thriving, slowly it became evident that there are consequences of industrialization. It was then; that man started searching for a way out. This resulted in proposals for new city planning and new concepts of cities with green spaces such as Howard's Garden city. From then onwards it has been a slow but steady progress towards having more planted areas in cities in some parts of the world.

In Sri Lanka having green spaces was a traditionally accepted norm and with the natural surroundings of the tropics, the religious background and an intuitive quest of the people to be in naturalistic surroundings every historical city was more or less an arrangement of buildings in a larger area of green. As a result of Buddhism being the major influence on people the green spaces took a more naturalistic approach than the western counterparts (having topiary and more rigid forms) perhaps because harming even a tree was considered not

appropriate and planting trees was considered a good practice. In the 'Dewatha Sanyuktha Wanaropa Suthra' in the saying 'Ârãma rõpã wana rõpã.....planting of forests, consumables such as vegetables and fruits is stated as a good deed. Lord Buddha taught his disciples in parks and gardens and always during his journeys he stayed in 'Aramas' which are gardens. With the invasions from different cultures and religions and trade practices, the approach to green spaces gradually altered.

'Development' looked at in a different perception severely affected the open and green spaces where every space available without building or used for commercial purposes was considered as a waste of resources. Sri Lanka, especially Colombo, now faces a number of problems of which the severity will increase in time to come.

In chapter three some green spaces of Colombo were discussed and most of them were shown to be not properly maintained. Maintenance of the spaces is critical because the usability in turn the existence itself of the green spaces will be affected by that, and also the continued fertility of the soil and well – being of planting.

With population increase in the city of Colombo the need for more open and green spaces for relaxing, contemplation and recreation needs increases. It is seen that the hard surfaced areas in the city increases with more buildings, and when roads and pavements are constructed. As we pave over more and more open green space, we should keep in mind that we're losing more than a few inconsequential trees and shrubs; we are losing an important human resource, a healthy nation, in a problem free environment.

A city is a stressful environment for its citizens. The overall pace of its life and number of impressions cause hectic lifestyles with little room for rest and contemplation.

Botkin and Beveridge (1997) argue that "Vegetation is essential to achieving the quality of life that creates a great city and that makes it possible for people to live a reasonable life within an urban environment".

When a city is designed, if it is difficult to provide nine acres of park land per thousand people as Howard suggested, I would recommend at least having six acres per thousand people, allowing a little less than a perch of private space for every person. In a city of which I would be the Landscape Architect, there will be central parkland of a considerable size. This will be easily accessible to all the city dwellers and would act as a core area of planting to provide all the benefits discussed in the above chapters as well as an evacuation ground during an emergency, as the central park of United States acted during the terrorist attacks. In a war affected country like ours we should not forget that emergencies arise at any minute.

There will be belts of green areas connected to the central parkland from the outer periphery. This will enable the continuation of movement of faunal species, especially avifauna and with them other small animals maintaining the species diversity and the state of equilibrium of the environment. The plot sizes of the commercial areas and residential areas should be under a legal frame giving adequate importance to having green spaces in between. A Residential area, for example having a ten perch plot size, if one perch of ground is left essentially for planting, in a ten plot area this will add up to a considerable amount of ten perches of green space.

Streets too should have planted verges; this would protect the neighbouring house holds from dust, noise and un-breathable gases while providing the pedestrians a cooler, shady, dust free path to walk on.

Apart from the central parkland there should be mini parks in different places acting as support areas to the central park. These will act as resting and

recreational areas for local neighbourhoods and will be automatically connected as a green network visually and physically with each other if the earlier said street and home garden planting is carried out.

Although imported species of plants give a splash of colour to the landscape, introducing more native species of plants is also another necessity to maintain the original biodiversity. This will enhance the aesthetic value in the context of a tropical area. One should also avoid the uniformity of spaces and their characters and preserve the original characteristics of a locality and habitat which will help the neighbouhood population feel at home.

> 'One of the big faults of the modern urban planning has been the development of cities characterised by repetitiveness and little attention paid to the natural features and resources of its habitats local tradition and culture. In addition to this the construction of urban roads with high density of motorised traffic, increases the sense of danger along with air, noise and visual pollution, and that generalised sensation of uneasiness that the city inhabitants well know. The described factors resulted in alienating settlements, increasing the citizens' feeling of discomfort and contributing significantly to generate social tensions. We believe that the maintenance, whenever it is possible, of the traditional manmade and/or natural green spaces of our cities, will greatly help to preserve the local identity of the sites, enhancing, in the citizens, the feeling of belonging to a well identified cultural entity. (URGE manual 2004)

Creating 'Urban Forests' is another trend found in cities and is of particular impotence to Sri Lanka in helping to shade and mitigate the effects of heat.

These too may contain endemic and indigenous species, medicinal plants, and rare species of plants as conservation areas and may be manured using organic fertilizer.

Tarmac and built up areas should make good use of green roofs. This will reduce energy consumption in cooling the inside of the buildings. When air conditioners are used to cool the inside of a building, people do not think about the fact that the machines increase the temperature of the outside in the process, making an imbalance of temperature which will affect plant and animal life adversely and increase the need for more cooling devices making it a never ending cycle. The reduction of hard surfaced areas too will bring down the risk of flooding. Green areas will help absorb down pours, collecting areas in the form of ponds or lakes to slow down water runoff to river and canals causing flooding and an adequate drainage system which is maintained well without being blocked by garbage specially polythene. These are a must in every city.

Most of the areas in a city should be as low maintenance as possible for; maintenance is one of the limiting factors of having green spaces and the usability of them. Participation of the private sector in creating and maintaining green spaces is another important factor when the urban green spaces are considered.

The present situation of encroachment and illegal use of public space is taking place due to inappropriate implementation and lack of necessary legislation in the country regarding the urban spaces and spaces of recreational value. A firm step towards implementing and bringing forward new legislation to have more green spaces is a timely action.

When a city landscape is designed one must think about accessible designs. People should have easy access to the green and open spaces. Some areas may be in walking distance while to reach others there should be transport facilities.

Also these designs must have easy access to everybody and specially the needs of the disabled has to be considered.

The mainstream decision making or planning process should involve Landscape Architects since designing of buildings and construction is to be done in a wider context of the landscape. Buildings are a part of the landscape but some look at the green spaces merely as 'left over space'. They will only have green spaces in their designs if there is space available and it is seen as non – essential.

There is a proposal to increase the area of the Colombo city by filling up the sea adjacent to the city. In this regard my opinion takes a negative approach firstly because this would create an enormous imbalance in the environment and secondly because I think congregation of people into the city by concentrating all the development should be limited rather than increasing the size of the city to accommodate everything. Decentralising would reduce people coming into the city. This would reduce the demand for living, dining, parking and office spaces and lower the pressure on green spaces and limit the use of vehicles reducing the damage caused by green house gases.

Design considerations should also include the coastal belt along the western margin of the city. A well planted coastal belt incorporating a cycle way and long distance footpath is a must to reduce erosion, limit wind action and natural disasters such as tsunami. The coastal region includes terrestrial ecosystems and shoreline ecosystems including coral reefs, mangroves, lagoons and estuaries.

Adequate provision has to be supplied for waste disposal especially solid waste disposal since it has a direct effect on the green spaces. In Colombo and the suburbs one of the main threats on the remaining green spaces is that they are used as dumping sites of garbage. If a proper plan to sort the garbage and recycle them is introduced, one major problem of finding places to dispose

garbage will be solved with the additional benefit of salvaging the green spaces used for that purpose.

A city where people move about freely using the planted connections between green areas without being disturbed by the scorching sun, with proper secure places for children to play, resting places for tired travelers and pedestrians and aesthetically pleasing appearance is what anybody who enters a city would like to see. This environment attracts birdlife and other animals, is a home to many tree species, enhances the biodiversity, reduces the threat of flooding and air and sound pollution, helps reduce global warming, reduces the cost on infrastructure such as electricity saving on air conditioners. With all these it will be a place which helps to maintain a sustainable or 'more than sustainable' environment we can be proud of.

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"Poinciana, your branches speak to me of love
Poinciana, your branches speak to me of love
Poinciana from now until the dawning day
Our love, will live forever and a day
Blow tropic wind, sing a song through the tree
Tree sigh to me, soon my love I will see"

.....Song to the Poinciana (Margaret P. M. Bourne, 1996)-

Recreational Zone.

Background

Existing out door recreation spaces in Colombo are inadequate for its population even by minimum accepted standards.

There are 171 ha of such space in the municipal council area, almost half of which belongs to private owners & organizations such as clubs. It is there for proposed to designate the river & canal reservations as linear parks.

The beach strip along the Gall road from fort to Wellawatte and between major town centers such as Kollupitiya & Bambalapitiya will be cleared of buildings.

Objection

To ensure environmentally sustainable development in harmony with the natural network of wetlands, water bodies, marshes, rivers, beaches etc.. by reinforcing to enhance the garden city image.

Permitted uses

a. Residential, Apartments, Commercial, Banks, Restaurant, Hotels & Departmental shops as specified by the development guide plan.
b. Water sports, Bowling alley, Promenades, formal pedestrian mall /walk -way , plaza, Linear park connectors, Golf courses, fair & exhibition gardens, Recreation clubs, Gymnasiums & swimming pools, Aquariums, recreation related commercial activities, cemeteries, restraints.
c. In the reservation zone the following uses shall not be permitted.
   Industries & Industrial Buildings
   Dangerous & Offensive trades

Importance of establishing a recreational zone.

1. To create a distinctive garden city image
2. To release the burden of compacted land use in Colombo city.
3. Increase the amount of buildable land for recreational purpose in under to prevent speculative increases of land prices & undesirable subdivision.
4. To enhance the services beauty of the city by creating open spaces, green belts & recreational areas which will become part of the city.
   It will be important to promote environmentally sustainable urban growth.

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