



In a fast growing city, the place of nature is very challenging. On the one hand, it forms the core framework based on which the city develops while on the other, it faces serious challenges in the realm of urban development. This research document attempts to construct a perspective to recognize the role and value of nature in making our cities more livable. The educational work delves on the natural history, relationship of nature with culture and lists and maps ecologically significant areas (both natural and manmade) in the city. The knowledge of the natural context will enable citizens to observe and analyze present day development opportunities and concerns in a much more sensitive and balanced manner in which conservation of city's natural resources holds equal value.

JOURNEY SO FAR

The narrative surveys the changing relationship of different cultures with nature. In a fast-growing metropolis it is helpful to know the natural context while we analyze the opportunities for the conservation of its natural resources.

MAPPING NATURE

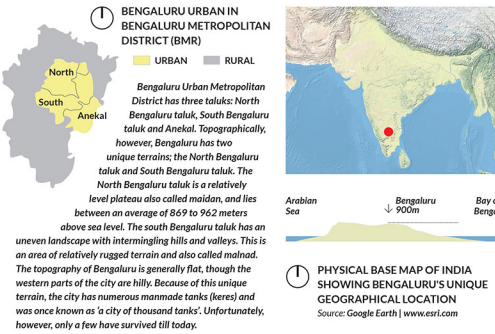
The map lists ecologically significant areas, both natural and manmade – forests, rivers, parks, lakes and tanks in the city.

This is a living project. No knowledge is exhaustive. We would appreciate readers' contributions towards these themes and environmental concerns of the city. We encourage them to write to landscapefoundationindia@gmail.com. We would be happy to include suggestions in future editions of the research.

THE REGION

Bengaluru, the capital city of state of Karnataka is located on the Deccan Plateau at an average elevation of 900 meters above the main sea level. With an urban area of more than 700 sq km, it is situated at approximately 300 kilometers from both the eastern and western shorelines in the southern plains of Karnataka. The region has a much evolved geological structure, one of the world's oldest, that includes ridges (beta), valleys (kanive) and plains (maidan).

Due to its high elevation, Bengaluru enjoys a moderate climate with rainy summers. The climate is considered to be Aw according to the Köppen-Geiger climate classification with distinct wet and dry seasons. The temperature here averages 23.6 °C with an average annual rainfall of more than 800 mm. The region experiences summer season during the months of April to June, followed by the southwest monsoon winds from Arabian Sea from June to September, followed by retreating of these winds and, thus, is also called the northeast monsoon. From November to March, the northeast winds blow towards the south from Bay of Bengal. The location combined with the region's high elevation contributes to its cool, dry and pleasant weather that persists almost throughout the year.



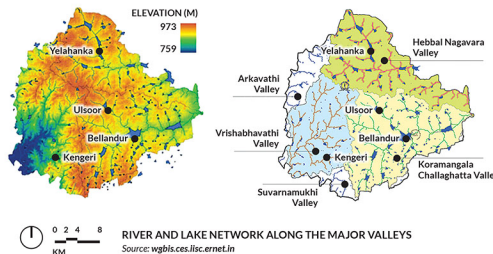
SOILS

The region has distinct red colored, loamy and clayey soils that occur in vast tracts. It gets its distinct color due to the presence of iron in the residual products of the Granites and Gneisses that make up the region's landforms. The southern part of the region is hilly and the rest of the areas form an undulating terrain. The major part of the area slopes towards south and southwest with a series of NNE-SSW trending hills. The chief rock types occurring in Bengaluru North Taluk are granites and gneisses. These are prominently exposed as the ridge running NNE and SSW. Bengaluru South and Anekal Taluk comprise granites and granitic gneisses belong to Pre-Cambrian age. The granitic gneisses are exposed as continuous chains of mound raising 30 to 70 meters above ground level in the southern region of the taluk. One of the best exposed rock masses of Peninsular Gneiss, the older gneissic believed to be 2.5 billion years old, can be seen at Lalbagh.



DRAINAGE

The city has no perennial source of water and no major river through it. The natural flow of the water- and its network of streams slopes away from the city and into the surrounding valleys. Depending upon the topography, the catchment area of rainfall and surface runoff gets divided into three valleys - Challagatta, Hebbal and Vrishabhavathi. The drainage of the north is governed by the granitic ridge running from north-east to south-west, while the drainage system on the eastern side comprises of a network of channels generally flowing from west to east. The region has two river basins. Cauvery and Dakshini Pinakini. In the western half, the drainage pattern comprises of a network of channels flowing from east to west and pouring in Arkavathi river. The Southern region is marked with series of hills, through which several rivulets flow to drain west into the river Arkavathi and drain east into the South Pinakini basin while Vrishabhavathi tributary, in the southern region, drains into the Arkavathi.



HISTORICAL NARRATIVE

1 CITY OF TANKS 16TH-18TH CENTURY

In the absence of any perennial source of water, the natural topography of the city allowed settlements to develop a system of interconnected tanks (keres) which were water holding structures built for the daily needs of the settlements. This system of harvesting water, maintained by communities, was adopted across the region. Over a period of time, along with being functional, these tanks became important cultural places. With conducive weather, the art of planting supported by water from this system, evolved to such an extent that, in the decades to follow, the region became a national hub of horticulture and plant related fields.

Many historical evidences suggest that from the fourth century onwards, the region, comprising the present day city of Bengaluru, was part of several successive South Indian Kingdoms including Ganga dynasty, Cholas, Chalukyas, Hoysala and Vijayanagara Empire. It was however, Kempe Gowda I (1510-1570), who owned allegiance to a vassal of Vijayanagara Empire in Mysore region, who formally established a new capital city formally on the existing site in 1537 CE.

CAPITAL CITY OF KEMPE GOWDA IN 1537 CE

The city evolved into a structured settlement with a well defined road network that was flanked by various sectors organized in a grid pattern and segregated into different functions- religious, business, commercial and recreational. Two prominent streets in the network of roads intersected at Doddapete square – the heart of the town.



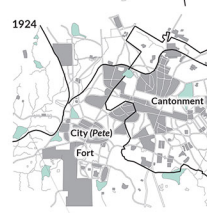
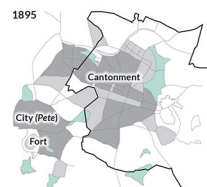
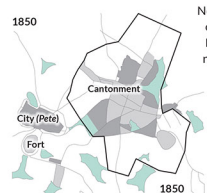
The region didn't have any perennial source of water like a river in close proximity. Following the existing tradition of water harvesting structures (since 9th century), a series of tanks (keres) were built for the daily needs of the population and for irrigation purposes. They were engineered by embanking the natural streams of the city's valleys and recharged shallow aquifers that were further linked to open wells. The natural topography with hills, plateaus, valleys and small streams (kaluves), further supported the creation of this ingenious system. Various settlements, temples and other religious structures emerged around these tanks. It gave much impetus to agriculture and also encouraged cultivation of fruit orchards, gardens and tree plantation in the new town. Kempe Gowda II, added a few more tanks, including Kempapura and Karanjikere, which were connected through streams thus forming a network across the three natural valleys of the region – Koramangala Challaghatta valley, Hebbal valley and Vrishabhavathi valley. These tanks were both ecological and cultural assets, performing environmental functions of recharging ground water, harvesting water, biodiversity habitats, controlling floods as well as acting as growth nodes around which new settlements got established.

In the centuries that followed, the region was ruled by Kempe Gowda's descendants, the Marathas for few decades and very briefly by Mughals. The town was then sold to the Wodeyar kingdom of Mysore. Under Hyder Ali, Commander in Chief of Wodeyar Kingdom, the city prospered both economically and culturally. One of its landmark contributions to the city was Sultan's Garden, presently known as Lalbagh, which is a garden complex laid on a site of forty five acres (originally) near one of the gateways of the old city. It was designed on the concept of Mughal Gardens with a geometrical layout and intricate irrigation systems. Later, it was extended by Hyder Ali's son, Tipu Sultan who imported many exotic species of tropical plants from across the borders of the country. Hence it became the Botanical Garden for the State of Mysore- a first of its kind in the country. The Garden (now covering an area of over two hundred acres) remained a working laboratory for many international designers, botanists and horticulturists, especially under the Colonial rule.

2 FORMALIZING NATURE 19TH CENTURY

The era under the colonial rule marked the changed relationship of the city with nature. While there were attempts to replicate the image of nature as seen in European countries and the contemporary Garden city movement, with the growing population, the times also called for exploring new ways of engaging with nature in an exclusive, formal and engineered way rather than having it associated with communities and people.

After the defeat of Tipu Sultan in 1799, the British took control of the city. They set up a Cantonment on the eastern side of the old city (pete) with Lalbagh to the south. With a moderate climate, the city saw a new era of development - public parks, tree lined roads and other outdoor recreational areas, especially for the European population residing in Cantonment. In 1864, the fields between the pete and Cantonment were converted into a city park of over two hundred and fifty acres, Cubbon Park (named after Sir Mark Cubbon, Commissioner of Mysore in mid nineteenth century). Developed by Major General Richard Sankey, British Chief Engineer of Mysore state, it was an English landscape garden based on the idea of picturesque winding paths, tailored water bodies and undulating meadows. This was one of the foremost examples of a city scale public landscape in the country, based on the European idea of nature.



Now the city had two contrasting images - the British occupied Cantonment on the east nurtured an English European culture while the pete on the west, where the natives lived was primarily used as an agricultural belt, with produce of millets, rice, coconuts, and fruit. In the pete, nature was intrinsically related with the culture of people with many agro cultural festivals for tanks, cattle and crops being celebrated. Over time, the belt between the pete and the cantonment became the city's biggest green lung (from Cubbon Park through the race course, golf course to Palace grounds and orchards).

HISTORIC MAPS SHOWING SETTLEMENTS

1850: Petes and cantonment
1895: Settlements in cantonment increased
1924: New settlements (Chamrajpet, Basavanagudi, Sankarapuram, Malleśwaram) seen.

— CANTONMENT BOUNDARY

Maps Reproduced by grafniti

The historic settlement maps over the period show an increase in settlements as more and more people came to live in the city. In the old city of the west, the earliest extensions of the city were Chamrajpet and Seshadripuram (1892). Later, as a safe refuge from a devastating plague in 1896, two more 'modern suburbs' were created on the outskirts of the city- Malleśwaram and Basavanagudi. People moved from the congested localities to these planned developments. Other examples of such planned developments during this period in the Cantonment area are Richmond town, Frazer town, and Cleveland town.

In late nineteenth century, the municipality began exploring the potential of other water sources to address the issue of shortage of water for the new population, finalizing on pumped supply from the Hesarghatta reservoir (1890s), over 40 kilometers away from the city. For the first time, in the history of the city, various water engineering works were constructed that brought water from the rivers located in the larger region. The water was stored in reservoirs built in various locations such as Chamarajasagar reservoir and Thippagondanahalli reservoir to name a few from where it was treated and supplied to the city. Simultaneously, Sampangi kere, Halsuru kere, Miller's tank, Hesarghatta kere and Sankey kere were built to meet the growing water demand.

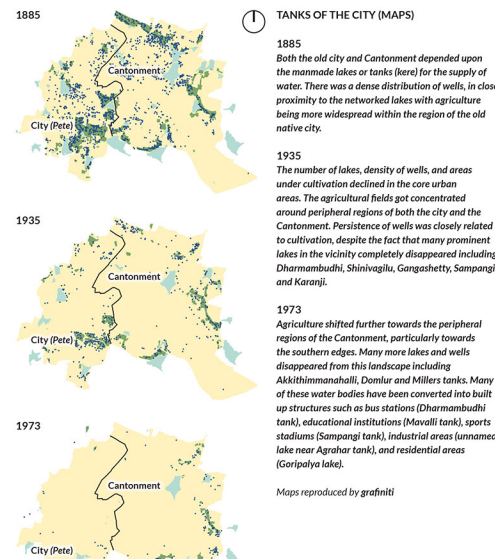
Later, the introduction of piped water in 1896 CE marked the onset of a decline of the traditional water infrastructure of the city. The once community-managed, thriving system of tanks (keres) and wells became neglected and were reclaimed for urbanization. Community open spaces, orchards, neighborhood gardens and tree groves gave way to manicured exclusive green spaces, tree lined avenues, vistas and avenues/public green spaces, which were starting to be formalized as places for recreation.

3 GREEN CITY 20TH CENTURY

The new movement of bringing nature into the realm of city planning as started by the British reached new heights in succeeding decades with contemporary Garden City concepts finding reflections in the urban planning of the city. These years laid the foundation which in coming decades changed the character of the city to a Green Capital.

German horticulturist and city planner Gustav Hermann Krumbiegel was appointed by King of Mysore as Superintendent of Government Gardens, comprising of Lalbagh Botanical Gardens and Cubbon park in Bengaluru and Curzon park in Mysore. During his tenure of nearly two decades, till 1932, he is credited with single handedly changing the character of the city, by introducing the idea of nature in the town planning of the city - its streets, roads and landmark places while exploring diverse ways to engage with nature - with land, with water, with planting - in the city.

After India attained independence in the year 1947, the city became capital of the Mysore state. The boundaries separating the old city and Cantonment were dissolved. In early fifties, continuing the tradition of Garden City, many farms, nurseries, gardens and parks were laid out. In early eighties, many urban forestry programs in the city, which included cultivation of mix plantations of Indian and non-native flowering trees were implemented. Many new neighborhoods, based on the Garden City concept, with tree lined avenues, vistas and parks were developed - Kumara Park and Jayanagar, followed by "Palace Orchards", now called Sadhashiv Nagar to name a few. With its numerous water bodies, expansive parks and wide tree-lined avenues, the city imbibed a unique character.



4 NATURE IN A HI-TECH METROPOLIS 21ST CENTURY

The scale and pace of development in a fast growing metropolis has drastically changed the character of the city. Most of the traditional water harvesting structures of tanks (keres) are now covered and reclaimed for urbanization, the surviving ones, having become defunct, are a threat to health and safety. With the distant river Cauvery, flowing at a lower elevation, becoming the main source of water, the present and future trends in planting and gardening is being guided by the idea of only "aesthetic" rather than ecology, there is an urgent need to reconsider the direction of growth in which the city is proceeding.

With the liberalization of Indian economy, new government policies both at State and Centre levels, along with other socio economic factors, a conducive environment was created for the city of Bengaluru to become the country's first IT Hub, much like Silicon Valley. Various global companies, new start ups, BPOs, multinational companies, institutes, and corporations set up their offices in the city. Various world class commercial hubs were created with the world's top most brands addressing the aspirations of new prosperous middle class. The resulting urbanization, on a fast track mode, changed its urban character within a short span of few decades. Information Technology offices, mostly located in large campuses (referred as IT parks), gated residential enclaves, management of which would often be handed over to private companies or residents' welfare associations (RWAs) - all contributed in converting a large part of public space of the city under exclusive and restricted domains.

