

ENVIRONMENT

Chennai Metro's Environment news, views and announcements

BLUE GREEN INFRASTRUCTURE & CLIMATE RESILIENCY



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Human Race in the process of development in the past century created more concrete jungles rather than keeping balance in the ecosystem. The cascading effect of losing greenery and water bodies has shattered the process of keeping balance with the natural phenomenon. Rapid industrialization and urbanization resulted into degraded landscape with a few green dots and caused climate change in the biosphere. As an outcome many part of the country is becoming more dry, wetter or hotter. Climate change can be addressed by adopting green infrastructure practices which are very much needed in the fast upcoming cities. Now cities planner have alter their urban planning and infrastructure design and they are incorporating nature driven solutions as a counter to conventional infrastructure practices by harnessing blue elements (seas, rivers, lakes, ponds, marshy lands, green belt, wetland and forest).

Cities which occupies only 2% of the Earth's surface area are key contributor to climate change. They consume the maximum energy (78%) of the world's energy and produce 60% of Green house emissions. Recently Society has witnessed more frequent drought, cyclone, forest fire, heat wave and floods. This is all linked to climate change due to influx of fossil fuel and aerosol into the atmosphere. Most of the landscape in the cities lost their originality, due to change in the river course, greenery degraded forest and reduction in green cover.

The impact was visualized, accepted and realized. The planners are keen to develop **Blue Green Infrastructure**. I am sure that sustainable Environmental management through blue intervention and creating more green infrastructure could help to build climate resilience.

The proper interwoven network of the green (land) and blue (water) spaces in the larger landscapes can improve environmental conditions. This will not only support a green economy but also generate more employment opportunities and simultaneously it will help in enhancing the biodiversity of the region by keeping indigenous flora and fauna in mind. Now this concept is being adopted in most of the places to achieve the goal of climate change resilience.

Blue - Green infrastructure planning includes inventorying green assets and ensuring protection of natural water bodies.

We can achieve the goal of Blue- Green infrastructure by combining and protecting hydrology and ecology of the region without disturbing the ecosystem. It is the responsibility of each and every citizen to reduce the self carbon footprint and by creating more greenery either horizontally or vertically. The mushrooming of vertical infrastructure in the cities can adopt blue green technology to make sure their contribution as a micro climate change resilience.



**"A NATION BEHAVES WELL IF IT TREATS THE NATURAL RESOURCES AS ASSET WHICH IT MUST TURN OVER TO THE NEXT GENERATION INCREASED, AND NOT IMPAIRED IN VALUE".
-THEODRE ROOSEVELT**

BAMBOO TREE

The origin of the word Bamboo comes from the Malay word "Mambu". Malay is that the national language of Malaysia and Indonesia. within the late 16th century (1590-1600) the Dutch named it "Bamboes" after which it got its Neo-Latin name "Bambusa".

Bamboo belongs to the Bambusoideae subfamily of the perennial evergreen grass family Poaceae (Gramineae). It was German Botanist, Charles Kunth, that first published his taxonomic findings in 1815. Of all grasses, bamboo is that the largest and therefore the just one which will diversify into forest. Although bamboo is a grass, many of the larger woody bamboo species are very tree- like in appearance and are often called "bamboo trees".

Bamboos lack a vascular cambium layer and meristem cells at the highest of the culm (stem). The vascular cambium is that the perpetually growing layer of a tree's trunk beneath the bark that creates a tree increase in diameter annually. The meristem cells make the tree grow taller annually. Bamboos on the opposite hand don't increase in diameter or height. one bamboo culm reaches full height in only one season. It then persists for several years, gradually increasing the amount of side branches and branchlets, but neither growing broader or taller. Another important difference is that bamboos do not have a bark as trees do, they need protective leaves round the culm (culm sheaths) in their early stages of development. Some significance of Bamboo, finely milled bamboo powder is used as an exfoliant in cleansers and scrubs. The smooth bamboo particles are less harsh than the scraggly, uneven grains made from salt and nuts, making it safer and less irritating to sensitive skin.

Sweet, cooling, diuretic, febrifuge, expectorant, controls vomiting, stems bleeding and has been used for bacterial infections, also has been used to treat lung inflammations and phlegm that is difficult to expectorate.

AN INTERESTING FACT ABOUT BAMBOO, THOMAS EDISON USED BAMBOO FILAMENTS IN HIS FIRST LIGHT BULBS. ONE OF THOSE BULBS IS STILL BURNING TODAY AT THE SMITHSONIAN IN WASHINGTON, DC.



Leaf is considered antipyretic and diuretic and has been used for chest and head colds, pharyngitis and stomatitis with action being to encourage the flow of urine and suppression of fever. Tabisheer is considered a specific anti-inflammatory and tonic for the lungs. In the Ayurvedic system of herbalism it is considered a tonic. Sitopaladi churni is used for treatment and prevention of colds, coughs, bronchitis and asthma. Use of bamboo has been an ancient tradition in India and it is now being supported with modern technology and the youth is being provided with training for the bamboo industry.

The Indian Forest Act 1927 was amended in 2017 to remove bamboo for the category of trees. As a result, anyone can undertake cultivation and business in bamboo and its products without the need of a felling and transit permission. Import policy has also been modified to ensure the progress of the bamboo industry in the country.

NBM supports local artisans through locally grown bamboo species, which will actualise the goal of Vocal for Local and help increase the income of farmers, reducing dependency on imports of raw material. 10 most important species which are required by industry have been identified and quality planting material is being made available to farmers for plantations.

Common Facility Centres are being set up close to the plantations which will reduce the cost of transportation and increase local entrepreneurship, moving to a zero-waste approach.

The history of Chinese people planting and using bamboo can be traced back 7,000 years. In traditional Chinese culture, bamboo is a symbol of Oriental beauty.

The life span of bamboo is short compare to others 15- 20 year, but it very essential for our environment it acts as a natural purifier. Bamboo can absorb carbon di oxide and it generates up to 32-35 % of oxygen than same amount as tree.

Saravanan Parthasarathi
Intern (Environment)

COASTAL REGULATION ZONE(CRZ)

SARAVANA KUMAR R (D.M ENVIRONMENT)



CRZ is used for protecting ecological sensitive areas like mangroves, coral reefs which act as a shield against tsunami and cyclone. It helps to develop the coastal communities livelihood and also coastal environment in sustainable manner based on scientific principles.

CRZ is applicable and stretches over total coastline of India 7516 km, it also covers 9 states (Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha and West Bengal) and 4 union territories.

Coastal Regulation Zone (CRZ) notification was first issued in 1991 by Ministry of Environment, Forest and Climate Change (MoEFCC) under Environment (Protection) Act, 1986 with the mandate to take measures to protect and conserve our coastal environment

The coastal areas of seas, bays, creeks, rivers, and backwaters which get influenced by tides up to 500 m from the high tide line (HTL) and the land between the low tide line (LTL) and the high tide line have been declared as coastal regulation zone (CRZ) in 1991

High Tide Line

HTL means the line on the land up to which the highest water line reaches during the spring tide.

Low Tide Line

Similarly, it means the line on the land up to which the lowest water line reaches during the spring tide.

There is the separate regulation for island which is called as **Island protection zone**

Island protection zone (IPZ)

- **It allows eco-tourism projects 20 meters from the high tide line (HTL) in smaller islands like Baratang, Havelock, and Car Nicobar.**
- **In case of larger islands, 50 meters from the HTL is permitted.**

Classifications of Coastal Zones

CRZ-I: (ecologically sensitive areas like mangroves, coral reefs, biosphere reserves) No new construction shall be permitted in CRZ-I except. Projects Relating to the Department of Atomic Energy without permission from the MOFCC.

CRZ-IA: It allows “eco-tourism activities such as mangrove walks, tree huts, nature trails, etc” in eco-sensitive areas, demarcated as CRZ-IA. Sea links, salt harvesting and desalination plants and roads on stilts are also allowed in CRZ-IA.

CRZ IB: Inter tide areas

CRZ-II; (Areas which are developed up to the shoreline and falling within the municipal limits; includes built-up area – villages and towns are that are already well established).

CRZ-III: Areas that are relatively undisturbed and do not fall under either Category I or II and also include rural and urban areas that are not substantially developed. .

CRZ-III A:Rural Areas that are densely populated with a population density of 2161/km. They will have NDZ of 50 meters from HTL. Earlier it was 200m from HTL according to CRZ Notification of 2011.

CRZ-III B: Rural Areas that are densely populated with a population density of 2161/km. They will have NDZ (No Development Zone) of 200m from HTL.

CRZ-IV: The aquatic area from low tide line up to territorial limits is classified as CRZ-IV including the area of the tidally influenced water body.

CRZ-IVA : 12 nautical miles from the low tide line towards the sea

CRZ-IVB : Tide influences waterbodies.

NDZ : (No Development Zone) 50 meter from high tide line.

Benefits of Regulation of Coastal Zones

Economic Growth:

CRZ will lead to enhanced activities in the coastal regions thereby promoting economic growth while also conserving the coastal regions.

Boost to Tourism and Employment:

It will result in significant employment generation and better living standards and add value to the economy of India.

Boost to Conservation Efforts:

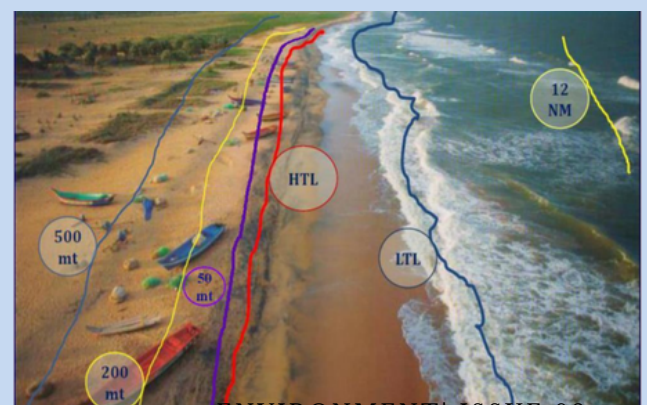
The new notification is expected to rejuvenate the coastal areas while reducing their vulnerabilities.

Boost to Housing

De-freezing FSI Norms will add to creating additional opportunities for affordable housing. This will benefit not only the housing sector but the people looking for shelter

CRZ clearances :

Only such projects/activities, which are located in the **CRZ-I (Ecologically Sensitive Areas) and CRZ IV (area covered between Low Tide Line and 12 Nautical Miles seaward) will be required to be cleared by the Ministry of Environment, Forest, and Climate Change.** For, the **CRZ-II (urban) or CRZ III (rural) areas, the CRZ clearance will be considered at the state level by the Coastal Zone Management Authority (CZMA)**



MANGROVES



: JAYAPRASAND D G (NATIONAL ENVIRONMENT SPECIALIST - GC)

Mangroves are a group of trees and shrubs that live in the coastal intertidal zone. Mangroves are extremely important to the coastal ecosystems they inhabit. Physically, they serve as a buffer between marine and terrestrial communities and protect shorelines from damaging winds, waves, and floods.

Mangrove thickets improve water quality by filtering pollutants and trapping sediments from the land, and they reduce coastal erosion. Ecologically, they provide habitat for a diverse array of terrestrial organisms, and many species of coastal and offshore fish and shellfish rely exclusively on mangroves as their breeding, spawning, and hatching grounds.

Because of their high salt tolerance, mangroves are often among the first species to colonize mud and sandbanks flooded by seawater, but an increase in coastal development and altered land use led to a decline in global populations. Several species are listed as vulnerable or endangered on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species.

There are about 80 different species of mangrove trees. All of these trees grow in areas with low-oxygen soil, where slow-moving waters allow fine sediments to accumulate. Mangrove forests only grow at tropical and subtropical latitudes near the equator because they cannot withstand freezing temperatures. Many mangrove forests can be recognized by their dense tangle of prop roots that make the trees appear to be standing on stilts above the water. This tangle of roots allows the trees to handle the daily rise and fall of tides, which means that most mangroves get flooded at least twice per day. Mangroves as **shelterbelts** are strips of vegetation composed of trees and shrubs grown along the coasts to protect coastal areas from high velocity winds and also from devastations like the ones caused by tsunami. They also serve the purpose of sand binders and **prevent sand erosion**. Mangroves also provide shelter for various marine ecosystem like prawns, fishes, seahorses etc. **Honey** is collected from the wildflowers of the open mangroves of West Bengal. This Honey is collected in traditional way from wild beehives.

The roots also slow the movement of tidal waters, causing sediments to settle out of the water and build up the muddy bottom. Mangrove forests stabilize the coastline, reducing erosion from storm surges, currents, waves, and tides. The intricate root system of mangroves also makes these forests attractive to fish and other organisms seeking food and shelter from predators.



In India, mangroves are found in coastal states i.e. Tamil Nadu, Odisha, Andhra Pradesh etc., and in islands like Andaman & Nicobar Islands. Sundarbans, the world's largest mangrove forest is situated in West Bengal.

LIGHT POLLUTION

Udita Gupta - Intern (Environment)



The glowing high-rise buildings of offices and residential buildings, kilometers of roads, highways lit up with street lights, yellow headlight and red taillight of vehicles running from one place to another keeps the city always bright and lit. This looks amazing when somebody first visit a city but this has numerous hidden negative impacts on plants, animals, insects and also on humans. The excessive use of artificial light is termed as light pollution. The use of artificial lights is increasing with increase in development, infrastructure and connectivity. Light pollution does not raise the alarm that air or water pollution does and this is the reason why there are no guidelines or safety standards in most parts of the world.

Light pollution is considered harmless, or sometimes even desirable, as neon-spangled Las Vegas and New York become the template for other aspirational cities. The change to LED technology could worsen the problem and increase light pollution to two or three times the current levels unless corrections are made.



EXCESS OF LIGHT IS POLLUTION INDEED

Light pollution not only disturbs astronomical studies but it also has farfetched worse impacts on biodiversity and ecosystem. Lighting disrupts photosynthesis and the activities of insects, birds and other animals. Artificial light at night puts a spanner in the works for nocturnal animals, interfering with reproduction and impacting populations. For young turtles and birds, disorientation can be fatal. For most creatures on Earth, the sun and the moon have been the only sources of light that acted as a compass for navigation, until artificial lights have disturbed that. The navigation of birds using the horizon as orientation for the direction is disrupted by lighting and sky glow. Glow worms, which communicate with their glowing bodies, face a snag in the process. Dung beetles, which use the Milky Way for navigating, are known to lose their way with artificial lights. Nocturnal foragers like bats fail to recognize when it is dusk and miss their feeding times. Birds, including those that use natural light to time their daily and seasonal foraging, communication, reproduction and migration, are also affected by light pollution. Agricultural crops like maize and soya grow rapidly but do not produce flowers in the presence of artificial light, thereby affecting yields. Some wild trees are known to produce fewer flower heads, attracting fewer pollinators, and aphids that feed on them.

Increased artificial light affects the growth and development of plants too. Studies in Europe have shown that plants in urban areas retained their leaves for a long time in the fall season, and started to bud back into life early in the spring, increasing their risk of exposure to pathogens and frost. In case of human beings' artificial illumination disrupts health, contributing to poor sleep, obesity, diabetes, certain cancers and mood disorders.



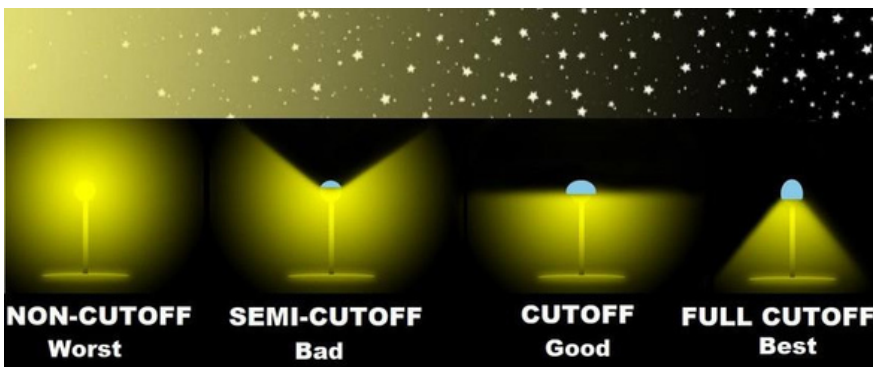
EVERYTHING IN
EXCESS IS OPPOSED
TO NATURE.

MITIGATION OF LIGHT POLLUTION

The above-stated problems can be solved up to some extent by implementing mitigation measures. First of all, the concept of “Zero upward light” should be adopted.

Street lights should be “full cut-off” which will prevent the upward transmission of light. To minimize the negative effects of artificial lighting, new strategies for light management are necessary. The light must be used more precisely. Low-intensity lights should be used on hoardings in order to have less brightness. It should be less intensive and in longer wave lengths so it is less disruptive to the wildlife. Newer technologies are allowing us to use lamps in which lights are invisible to animals but visible to humans. Use of nature-friendly and wildlife-friendly lights should be designed and used. Now many authorities have started understanding the gravity of the issue and have started implementing some rules in order to prevent light pollution, but still, more stringent rules and acts are needed so that the exploitation can be brought under control.

**ZERO UPWARD
EMISSION OF
LIGHT CAN HELP IN
MITIGATING LIGHT
POLLUTION UP TO
GREAT EXTENT**



For any queries/comments or submission of articles in this newsletter, kindly contact Dr Rajeev Srivastava, Chief Advisor (Environment) or send an email to srivastava.rajeev@cmrl.in



CMRL - Managing Director Mr. Pradeep Yadav I.A.S inspecting the Green initiatives at Chennai Central Square Project.