CHENNAI METRO RAIL LIMITED

ENVIRONMENT NEWSLETTER

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OUR POWER OUR PLANET

The Environmental progress doesn't depend on any single administration or election. It's sustained by daily actions of communities, educators, workers, families, and individuals protecting where they live and work.

EARTH DAY 2026

Message from the Managing Director

On the occasion of Earth Day, I extend my warm greetings to all. This year's theme, Our Power, Our Planet, reminds us that the responsibility to safeguard our environment lies with each one of us.

At Chennai Metro Rail Limited, sustainability is at the core of our vision for urban mobility. As we continue to expand Chennai's metro network, we are committed to adopting environmentally responsible practices—protecting biodiversity, conserving natural resources, and reducing our carbon footprint. Our initiatives reflect the belief that infrastructure development must go hand in hand with ecological preservation.

Let us reaffirm our commitment to building a greener, more resilient future through collective action and conscious choices.

M.A. Siddique I.A.S
Managing Director
Chennai Metro Rail

Message from the Director (Projects)

Earth Day serves as a powerful reminder that sustainable development is essential to the future of our cities. The theme, Our Power, Our Planet, highlights the role of communities and individuals in driving meaningful environmental change.

At CMRL, every project is designed with a strong focus on sustainability. From integrating eco-friendly construction practices to ensuring minimal disturbance to surrounding ecosystems, we strive to balance development with environmental responsibility. Our approach is guided by the understanding that today's infrastructure must support tomorrow's environmental needs.

Let us all continue to work together for a sustainable future.

T. Archunan
Director (Projects)
Chennai Metro Rail.

PREFACE

It is my pleasure to present this special edition of the CMRL Environment Newsletter, dedicated to Earth Day, observed globally on 22 April, which reminds us that protecting the environment is a shared responsibility, driven by the everyday actions of individuals and organizations.

For CMRL, the theme strongly aligns with our commitment to sustainable urban mobility. As we expand Chennai's metro network, we continue to integrate environmental considerations into planning, construction, and operations, ensuring reduced emissions, efficient resource use, and enhanced ecological balance.

This newsletter highlights Earth Day's significance, key environmental practices in infrastructure development, and the importance of aligning local actions with global climate goals. It also underscores how practical, site-level interventions can contribute meaningfully to broader environmental outcomes.

I sincerely appreciate the Environment Team for curating this insightful edition. On this Earth Day, let us remember that "Our Power" lies in collective action, and "Our Planet" depends on how responsibly we use it today for future generations.

Dr. Rajeev K Srivastava I.F.S (Retd.)
Chief Advisor (Environment, Gender & Social)
Chennai Metro Rail.

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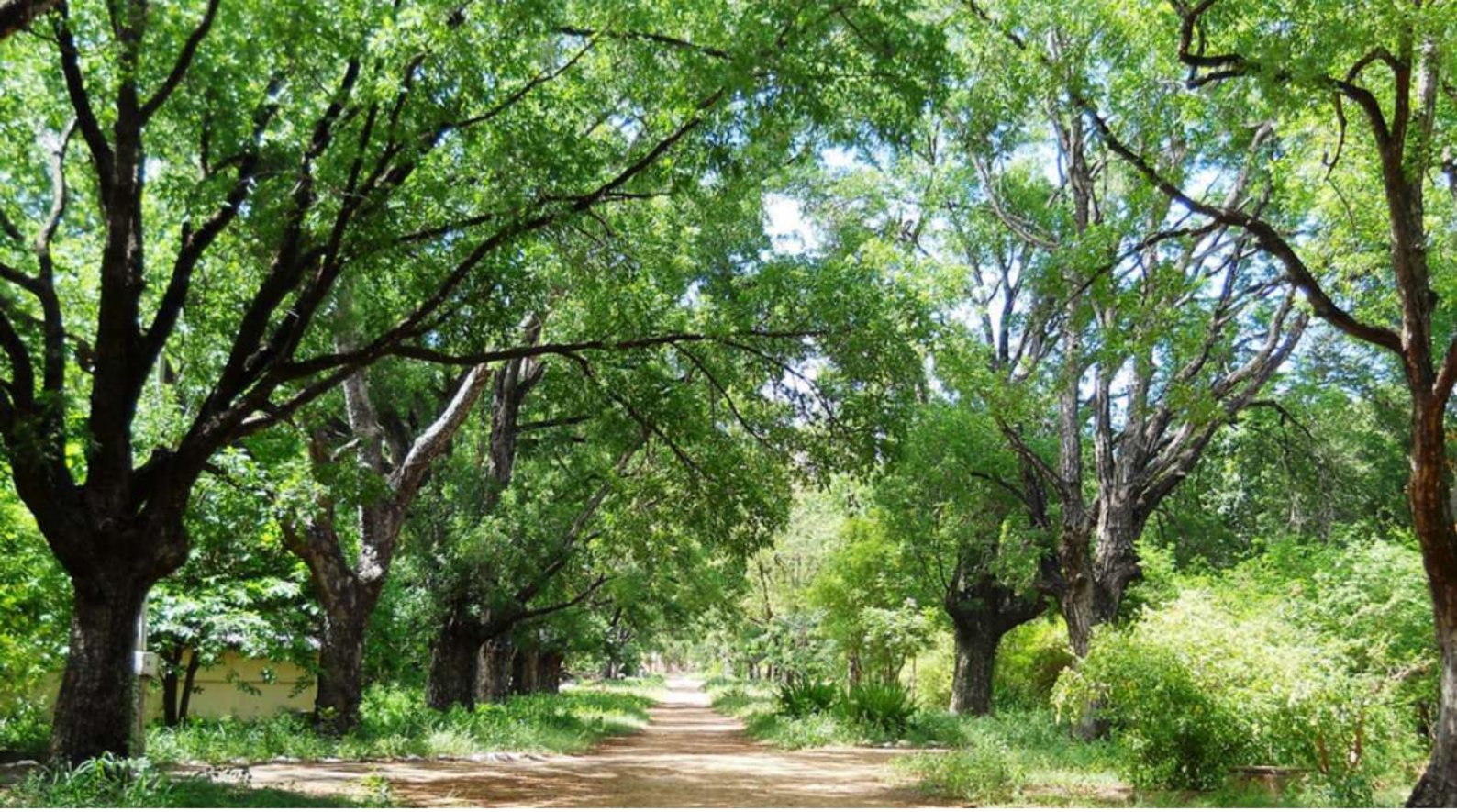


Trees in Chennai

Urban Green Cover and Native Species

CMRL Promotes Sustainable Greening Along Metro Corridors

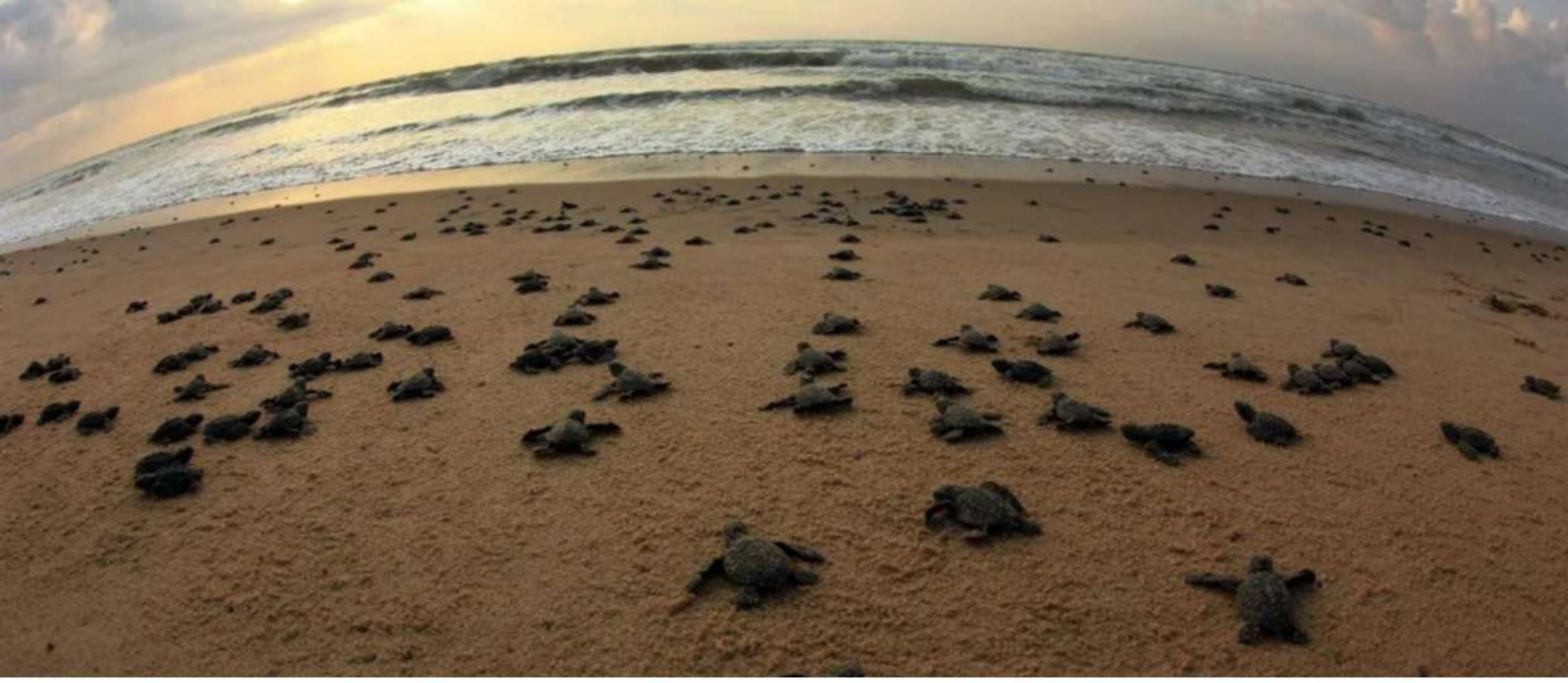
Saravana Kumar R
Manager Environment
CMRL

As urbanization accelerates, enhancing green covers has become essential for maintaining environmental balance in the city. Trees play a vital role in reducing heat, improving air quality, and supporting urban biodiversity. Recognizing this, Chennai Metro Rail Limited (CMRL) under the guidance of Chief Advisor (Environment) is actively integrating native and climate-resilient tree species into its metro infrastructure.

Indigenous species such as Neem, Banyan, Peepal, Naval, Magizham, Thespesia, and Arjuna, which are well adapted to Chennai's tropical climate, are being prioritized for compensatory plantation. These species require relatively low maintenance while delivering significant ecological benefits, including carbon sequestration, air pollution mitigation, microclimate regulation, groundwater recharge, soil stabilization, and enhanced urban biodiversity through habitat provision for birds and pollinators.

CMRL has undertaken avenue plantation along metro corridors and landscaping at stations and depots to improve the microclimate and commuter experience. In addition, compensatory afforestation is being carried out as part of CMRL's commitment to environmental sustainability and in compliance with applicable environmental regulations.

Despite challenges such as limited space availability and utility constraints, CMRL continues to adopt scientific plantation methods, including the Eco Vibrant Units concept introduced by the Chief Advisor (Environment), along with robust monitoring mechanisms to ensure higher survival rates. By emphasizing indigenous species and sustainable greening strategies, CMRL is strengthening Chennai's climate resilience and urban environmental quality, in alignment with its vision — "Moving People, Sustaining Environment."



Metro with a Mission

Protecting Chennai's Ecosystems While Building Mobility

Vinoth Kumar R
AM Environment
CMRL

As Chennai continues to expand, the Chennai Metro Rail Limited (CMRL) has adopted a development approach that integrates infrastructure growth with ecological protection. While building a modern and efficient mass rapid transit system, CMRL has consistently demonstrated that urban transport projects can coexist with sensitive ecosystems through careful planning, engineering innovation, and environmental stewardship.

One of the most notable examples of this approach is the modification of the tunnel alignment near Foreshore Estate. This stretch lies close to Chennai's coastal zone, which is a crucial nesting habitat for the endangered Olive Ridley turtles. Recognizing the ecological sensitivity of this marine corridor, CMRL reworked the alignment and refined construction methodologies to minimize disturbances. These adaptive engineering decisions reduced the impact on nesting grounds and ensured that underground construction activities did not interfere with the natural breeding cycle of marine life.

Moving inland, CMRL has placed significant emphasis on protecting biodiversity-rich landscapes such as the Nanmangalam Reserve Forest and the Pallikaranai Marshland. These ecosystems are among Chennai's most valuable ecological assets, supporting a wide range of bird species, reptiles, and wetland flora and fauna. Given their vulnerability to urban expansion, CMRL has adopted regulated construction practices, ecological monitoring, Noise reduction systems, Vibration control measures, etc. Additionally, wildlife-sensitive lighting systems have been introduced to prevent disruption to nocturnal species, while reflective and bird-safe materials have been used to reduce collision risks.

Another significant initiative is the restoration of Okkiyam Maduvu, a traditional stormwater channel in South Chennai. Once degraded due to urban encroachments and reduced flow capacity, this waterway has been rejuvenated as part of CMRL's broader environmental management strategy. Its restoration has improved stormwater drainage efficiency, enhanced flood resilience in rapidly urbanizing zones such as Okkiyampet and Sholinganallur, and revitalized local hydrological systems.

These efforts showcase how the Chennai Metro Rail Project contributes to ecosystem conservation, urban water security, and climate resilience, while developing sustainable transport infrastructure to infrastructure in the city of Chennai.

The Ground Beneath Our Feet

Why the Planet's Future Starts Locally

Saravanan P
AM Environment
CMRL

We often imagine the fight for the planet as something distant—taking place in global summits, policy negotiations, or scientific laboratories. But the message of Earth Day 2026 brings that vision closer to home. Real environmental change does not begin in distant corridors of power; it begins with people, rooted in the land they seek to protect. Our Power, Our Planet is not just a theme—it is a reminder that the most enduring solutions emerge from communities themselves.

India's environmental legacy reflects this truth deeply. Long before sustainability became a global priority, local communities across the country were already defending their ecosystems with resilience and conviction. These movements did not arise from formal institutions but from a profound connection between people and nature.

As early as the 1730s, the Bishnoi community of Rajasthan demonstrated extraordinary environmental commitment. In an act of ultimate sacrifice, villagers laid down their lives to prevent trees from being felled. This was not driven by policy or regulation, but by a cultural ethic that viewed nature as sacred and inseparable from human existence. That spirit of ecological stewardship continues to inspire India's environmental consciousness.

Centuries later, this same ethos found expression in the Appiko movement in Karnataka, where communities mobilized through cultural expression and grassroots campaigns to resist deforestation. Likewise, the Narmada Bachao Andolan brought national attention to the environmental and social impacts of large-scale infrastructure projects, amplifying the voices of affected communities.

Today, the call for action extends into the realm of clean energy. The push to expand renewable energy is not merely a technological shift—it is a social movement. Every rooftop solar panel, every community-led initiative, and every transition to sustainable energy represents a step toward a more equitable and resilient future. Clean energy is no longer just about reducing emissions; it is about empowering people and ensuring that progress is inclusive.

This Earth Day, the responsibility is both simple and profound: act where you are. Plant a tree, support local initiatives, advocate for sustainable choices, and inspire others. The power to shape the planet's future does not lie elsewhere—it lies beneath our feet, in the hands of those willing to protect it.

Our Power. Our Planet. Our moment to act.

Harnessing Renewable Energy for Sustainable Infrastructure Development

Jayaprasand
Natural Environmental Specialist - NKAB

In the construction and infrastructure sector, energy consumption is significant, making energy efficiency and renewable energy adoption essential. Organizations have the power to lead environmental stewardship by implementing innovative solutions that reduce carbon emissions and conserve natural resources. Sustainable infrastructure practices not only support environmental protection but also improve operational efficiency and long-term cost savings.

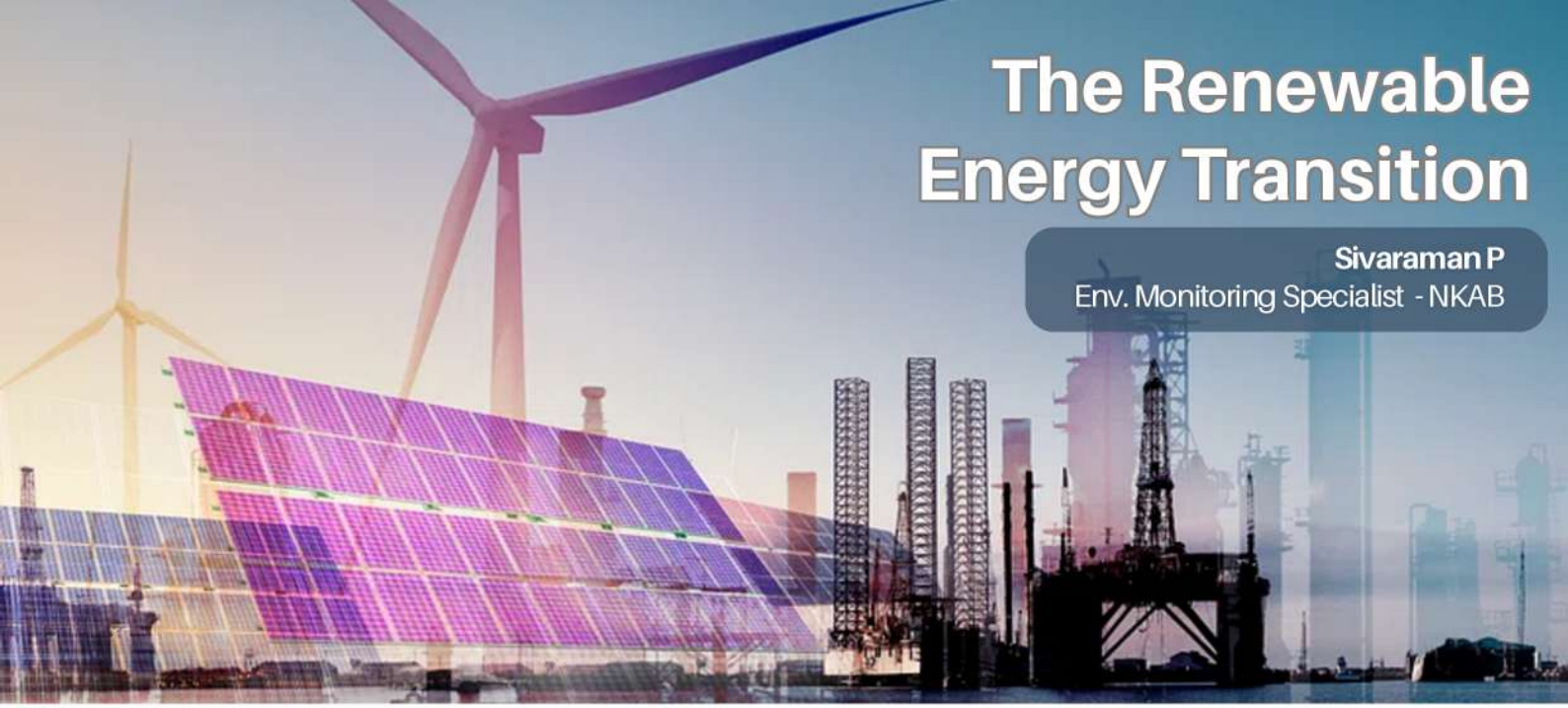
A practical example of this commitment can be seen in the Chennai Metro Rail Project – in C5 EV03 Package, where several energy-saving initiatives have been successfully implemented over the last three years in line with the spirit of “Our Power, Our Planet.” The project has installed a 50 kW solar power system in the labour camp and stores, generating clean and renewable energy to support daily operations. This initiative has significantly reduced dependency on conventional electricity sources and lowered greenhouse gas emissions.

In addition, daylight-saving sheets have been installed in the kitchen and store areas to maximize natural lighting and minimize electricity consumption during daytime operations. This simple yet effective measure has contributed to consistent energy savings and improved energy efficiency across the facility.

Furthermore, the project has deployed 150 solar-powered streetlights across the casting yard and labour camp. These solar street lights operate using renewable energy, reducing electricity usage while ensuring safe illumination during nighttime.

Over the last three years, the cumulative environmental benefits of these measures under the CMRL C5-EV-03 package have been significant. The total energy saved and generated is approximately 369,891 kWh, demonstrating a strong shift toward cleaner energy use. In addition, the initiatives have contributed to an estimated reduction of about 303 tonnes of carbon dioxide emissions, reflecting a meaningful decrease in the project’s environmental footprint.

These actions show sustainability is a responsibility that organizations can implement through practical measures. Investing in renewable energy, improving efficiency, and promoting sustainable operations helps infrastructure projects address climate change and protect the environment. Earth Day reminds us that protecting the planet is a shared duty. The theme “Our Power, Our Planet” urges industries, communities, and individuals to use collective strength for positive environmental change and build a cleaner, more resilient future.



The Renewable Energy Transition

Sivaraman P
Env. Monitoring Specialist - NKAB

The sustainable energy transition is a major shift in how energy is produced, distributed, and consumed, moving away from fossil fuels toward renewable energy systems. This transformation is essential to addressing the climate crisis, especially as fossil fuels still supply nearly 80 percent of global energy. It is not only an environmental necessity but also a pathway to economic stability, energy security, and social progress.

At the core of this transition is the concept of a just transition, which ensures that the shift to clean energy is fair and inclusive. It focuses on equity, human development, and protecting vulnerable communities from disruptions such as job losses, rising energy costs, and income insecurity. A just transition also emphasizes reskilling workers and ensuring access to clean energy across all regions.
A key driver of the energy transition is the rapid expansion of renewable energy sources such as solar, wind, and hydropower. These technologies are now the most cost-effective options for electricity generation in most countries. With continued investment, renewables are expected to provide over 90 percent of global electricity by 2050, significantly advancing the goal of a net-zero energy system. Expanding renewable energy access also helps improve energy availability in underserved and developing regions.

Another important aspect is the decarbonization of sectors that depend heavily on fossil fuels. Transportation, manufacturing, construction, and buildings together contribute a large share of global emissions. Electrification powered by clean energy, along with improved efficiency, offers the most effective way to reduce emissions while maintaining economic productivity.

The benefits of this transition extend beyond climate action. Renewable energy improves sustainability and energy security by reducing reliance on volatile fossil fuel markets. It also delivers major public health benefits by reducing air pollution, which is responsible for about seven million premature deaths annually. In addition, the transition is driving rapid technological innovation, including wind turbines, photovoltaic solar panels, and advanced battery storage systems that are reshaping global energy systems.

Equity remains a central pillar of the transition. A just and inclusive approach includes training workers for new green jobs, building infrastructure in emerging economies, and ensuring universal access to affordable clean energy. These steps help ensure that the benefits of the transition are shared broadly and no community is left behind. Achieving global climate targets, including the Paris Agreement goal of net-zero emissions by 2050, depends on scaling up renewable energy and reducing fossil fuel dependence. This requires strong international cooperation, supportive policies, and coordinated action across governments, industries, and communities.

Ultimately, the renewable energy transition is a shared global opportunity. Through collective effort and sustained commitment, it is possible to build a cleaner, more resilient future for all.

Building Sustainable Infrastructure Through Responsible Action

Selvendiran K
Sr. Env. Manager - NKAB

Every year on 22 April, Earth Day serves as a global reminder of our shared responsibility to protect the environment while continuing to support economic growth and infrastructure development. The Earth Day 2026 theme, “Our Power, Our Planet,” emphasizes that meaningful environmental change is driven by everyday decisions taken by individuals, communities, and organizations. At our construction project, this principle is actively reflected through practical, measurable initiatives aimed at reducing environmental impact and promoting sustainability.

A key focus area is the responsible use of natural resources. Construction activities typically require large quantities of water, energy, and fuel. To address this, the project has implemented targeted measures to optimize resource consumption. Groundwater conservation is being strengthened by reducing dependence on borewells and increasing the use of TTRO (Tertiary Treated Reverse Osmosis) water wherever feasible. This approach ensures sustainable water management while maintaining uninterrupted site operations and reducing pressure on local water sources.

In the field of renewable energy, continuous efforts are being made to enhance solar power systems installed at workmen camps and office areas. These systems help reduce reliance on conventional electricity and promote clean energy usage on site. In addition, solar streetlights are being progressively installed in place of conventional LED lighting systems, further lowering electricity consumption and reducing dependence on grid power.

Another important aspect of sustainability is reducing the project’s carbon footprint. Transportation and equipment operations are major contributors to emissions in construction activities. To address this, the project is gradually introducing electric vehicles and electrically operated equipment in place of diesel-powered alternatives. Where diesel usage remains unavoidable, biodiesel is being adopted to minimize emissions. Furthermore, replacing 3-star rated appliances with energy-efficient 5-star rated appliances contributes significantly to electricity savings and improved operational efficiency.

Waste management is also being strengthened through innovative solutions. Food waste generated at workmen camps is proposed to be processed through a bio-gas plant, converting organic waste into usable energy. This initiative will reduce dependence on LPG while promoting circular economy principles and sustainable waste utilization at the site.

While technology and systems are important, people remain at the core of sustainability success. Engineers, supervisors, contractors, and workmen actively contribute by adopting best practices in water conservation, energy efficiency, waste segregation, and site housekeeping. Over time, environmental responsibility is becoming an integral part of the project’s work culture.

Looking beyond Earth Day, sustainability is treated as a continuous commitment rather than a one-day observance. By integrating renewable energy, efficient technologies, cleaner fuels, and waste-to-energy solutions into daily operations, the project demonstrates that infrastructure development and environmental protection can progress together.

Enhancing Urban Biodiversity through Plantation of indigenous Species

Ram Singh
Environment Expert
AEON

Introduction

Urban infrastructure growth in rapidly expanding cities like Chennai poses significant challenges to ecological stability. More than 5,400 trees were removed for metro expansion, necessitating a scientifically designed compensatory mechanism. Instead of a conventional replacement approach, CMRL adopted a conservation-oriented strategy emphasizing biodiversity restoration and ecological enhancement through native plantations.

Methodology

A compensatory plantation ratio of 1:12 was adopted, resulting in nearly 72,000 saplings planted across 46 identified sites. Site selection was guided by ecological sensitivity, including riverbanks, watershed zones, barren lands, and drought-prone areas to maximize ecological impact.

Species selection prioritized native and climate-resilient plants suited to local soil and weather conditions, ensuring higher survival rates and reduced maintenance requirements. Around 38 species were introduced, including Azadirachta indica, Ficus religiosa, Terminalia arjuna, Syzygium cumini, Pongamia pinnata, Mimusops elengi, and others such as Sterculia foetida, Thespesia populnea, Albizia lebbeck, and Bambusa bambos. These species were grouped based on ecological functions such as drought resistance, nitrogen fixation, soil stabilization, carbon sequestration, and biodiversity support.

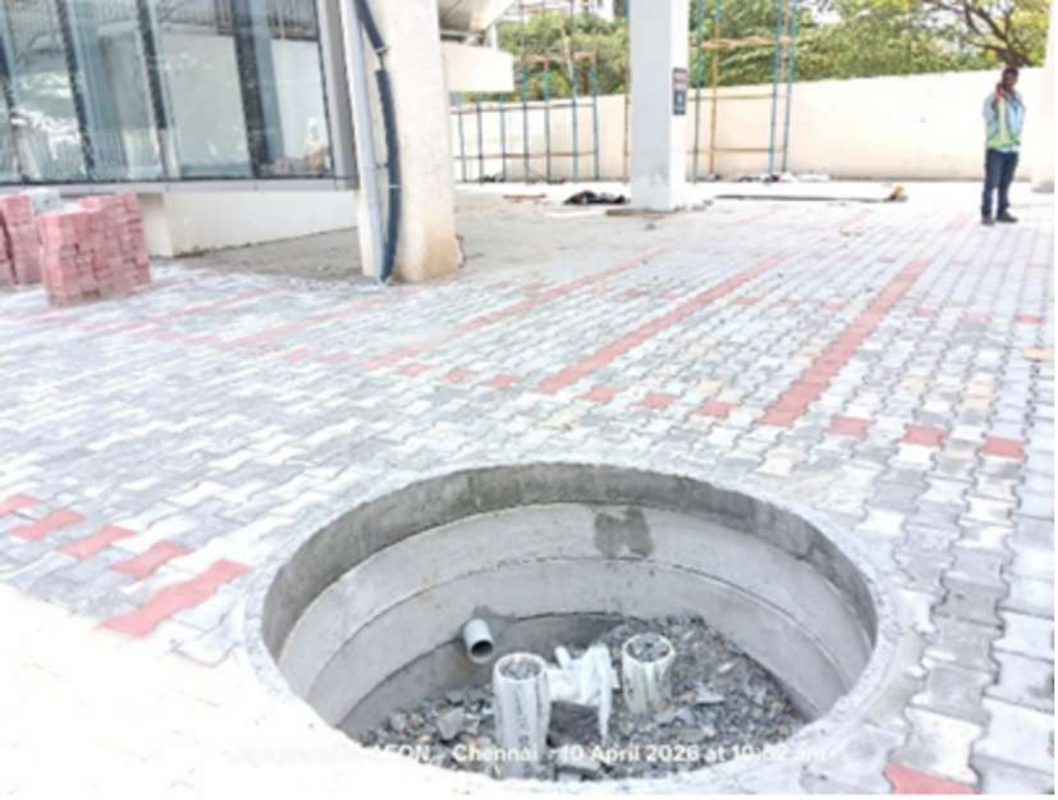
Result and Discussion

The plantation exhibits a balanced composition of 79.64% indigenous species and 20.35% exotic species, ensuring ecological integrity while supporting landscape diversity. Native species have significantly improved ecosystem stability due to their adaptability and support for local fauna.

Keystone species like Ficus benghalensis and Ficus religiosa enhance habitat availability for birds and insects. Terminalia arjuna and Pongamia pinnata contribute to riverbank stabilization, while fruit-bearing species such as Annona squamosa and Ziziphus jujuba support wildlife nutrition. Medicinal plants like Aegle marmelos and Emblica officinalis add socio-economic value. At the same time, timber and ornamental species, including Melia dubia, Khaya mahogany, and Lagerstroemia speciosa, contribute to long-term ecological and aesthetic benefits. Overall, the plantation enhances ecosystem services such as carbon sequestration, microclimate regulation, soil enrichment, and groundwater recharge.

Conclusion

The CMRL compensatory plantation programme demonstrates a holistic model of urban ecological restoration. By prioritizing native species and aligning plantation design with local environmental conditions, the initiative ensures ecological resilience and sustainability. This approach serves as a replicable model for sustainable urban development, integrating ecological balance with growth objectives.



Harvesting storm water run-off in Chennai Metro Rail Project

Jeyaprathiba B S
Environment Engineer
AEON

With rising water scarcity and rapid urbanization, Chennai metro rail project adopts rainwater harvesting systems to conserve natural resources, reduce dependence on groundwater, and promote long-term environmental sustainability.

In metro construction, the need for rainwater harvesting is particularly significant due to the extensive use of concrete surfaces, rooftops, viaducts, stations, depots, and casting yards. These large impervious areas generate substantial surface runoff during rainfall. If not properly managed, this runoff can lead to water stagnation, localized flooding, soil erosion, and wastage of valuable freshwater resources. A well-designed rainwater harvesting system addresses these challenges by capturing, treating, and reusing rainwater effectively within the project area.

A typical rainwater harvesting system in metro projects comprises several key components. The catchment area includes station rooftops, entry and exit structures, depot buildings, and paved surfaces that collect rainwater directly. From these surfaces, a conveyance system consisting of gutters, downpipes, and stormwater drains channels the collected water safely toward storage or recharge facilities. Before storage or reuse, the water passes through filtration units such as silt traps, sand filters, and oil and grease separators, which remove debris, dust, and other contaminants.

After filtration, the treated rainwater is directed into storage tanks, either underground or overhead, depending on site requirements. This stored water is then utilized for various non-potable purposes within the metro project, including construction activities, station cleaning, dust suppression, and landscape irrigation. In addition to storage, excess filtered water is diverted to recharge pits or recharge wells, which help replenish groundwater levels and improve long-term water availability in the surrounding area.

The functioning of the system is based on a simple yet effective cycle. During rainfall events, runoff from station roofs and paved areas is collected and guided through drainage networks. It then undergoes sedimentation and filtration to ensure quality before being either stored for reuse or used for groundwater recharge. This integrated approach ensures minimal water wastage and maximum resource efficiency.

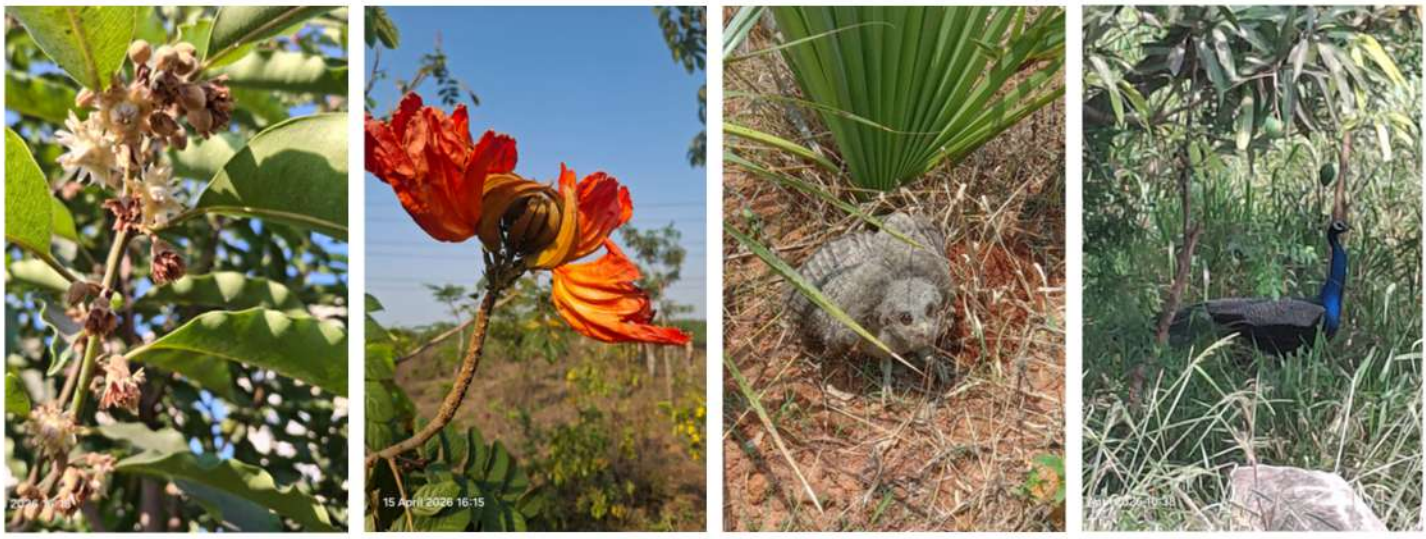
In conclusion, the integration of rainwater harvesting systems in metro rail projects significantly strengthens sustainable water management practices. It supports safety, enhances environmental performance, and contributes to groundwater recharge. By reducing dependence on external water sources and improving on-site water efficiency, this system reinforces compliance with environmental regulations and promotes the development of resilient and sustainable urban infrastructure for the future.

NEWS Bits

SUMMER MAINTENANCE FOR THE PLANTATIONS

CMRL has undertaken targeted maintenance measures to support saplings at plantation sites during the harsh summer conditions.

ENHANCED BIODIVERSITY IN CMRL PLANTATION SITES



Flowering and fruiting have begun at the CMRL plantation sites, attracting insects, birds, and animals, and fostering a vibrant and thriving ecosystem.

For feedback, queries, and submission of articles for the next edition of the Newsletter, Kindly contact Dr. Rajeev K Srivastava, Chief Advisor (Environment), or send an email to srivastava.rajeev@cmrl.in / saravanakumar.r@cmrl.in / vinothkumar.raju@cmrl.in.

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