



CHENNAI METRO RAIL LIMITED

ENVIRONMENT NEWSLETTER

ISSUE 10 | AUGUST 2026

CLIMATE ACTION

Our planet is changing rapidly due to human impact. The resulting extreme weather threatens global life and ecosystems. Immediate climate action, by cutting emissions and protecting nature, is our only path forward. We must build a sustainable tomorrow, starting now.

PREFACE

It is my pleasure to present this special edition of the CMRL Environment Newsletter, dedicated to Climate Action. The occasion reminds us that addressing climate change and protecting our environment are shared responsibilities that require sustained commitment, collective action and responsible choices at every level.

For CMRL, climate action is integral to our vision of sustainable urban mobility. As Chennai's metro network continues to expand, environmental considerations are being embedded across planning, design, construction and operations. From energy efficiency and renewable energy to climate-resilient infrastructure, water conservation, waste management, biodiversity protection and extensive plantation programmes, CMRL continues to adopt practical measures that reduce environmental impacts and strengthen the resilience of our infrastructure.

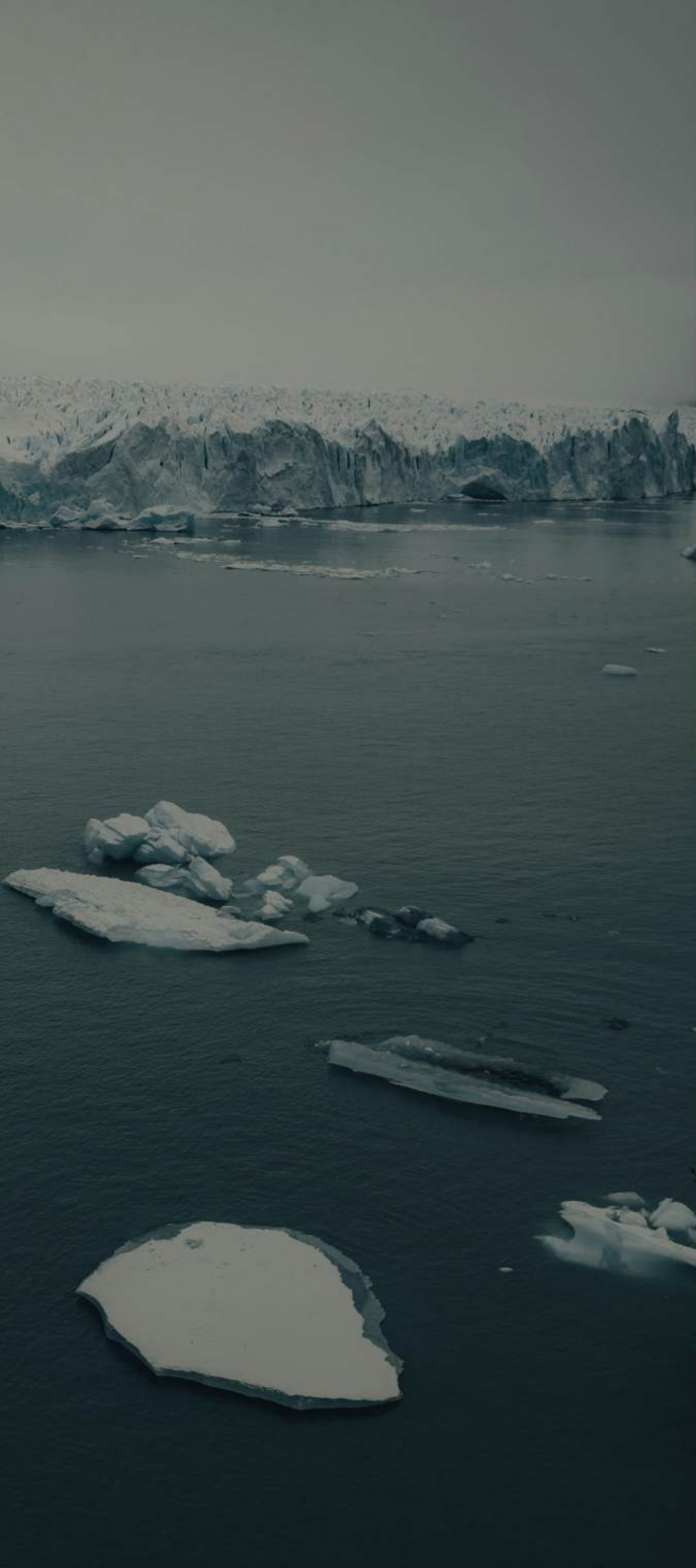
This edition highlights the significance of climate action, nature-based solutions and environmental stewardship, while showcasing initiatives undertaken by CMRL to support a greener, more resilient and sustainable Chennai. It also emphasizes that meaningful climate action is not limited to major projects; everyday practices, site-level interventions and individual choices collectively contribute to achieving broader environmental goals.

I sincerely appreciate the Environment Team for their continued efforts in promoting environmental awareness and for bringing out this informative edition of the newsletter. Let us reaffirm our commitment to climate action and work together towards building a cleaner, greener and climate-resilient future for Chennai and generations to come.

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Chief Advisor (Environment, Social & Gender)
Chennai Metro Rail Limited

**WORLD
ENVIRONMENT
DAY 2026**





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Nature-Based Solutions

Working with Nature for a Sustainable Future

Saravana Kumar R
Manager Environment
CMRL

As climate change, biodiversity loss, water stress and rapid urbanisation continue to intensify, Nature-Based Solutions (NbS) provide an effective approach that works with natural ecosystems to address environmental, social and economic challenges. The United Nations Environment Assembly (UNEA), through Resolution UNEP/EA.5/Res.5, adopted on 2 March 2022, recognised Nature-Based Solutions as an important approach for advancing sustainable development and supporting the achievement of the Sustainable Development Goals (SDGs).

What Are Nature-Based Solutions?

NbS involve protecting, conserving, restoring and sustainably managing natural or modified ecosystems such as forests, wetlands, rivers, coastal areas and urban green spaces. Examples include restoring wetlands to reduce flooding, increasing urban green cover to reduce heat, protecting mangroves from coastal hazards, and improving natural water conservation and groundwater recharge.

Why Do They Matter?

NbS can provide multiple benefits, including climate resilience, disaster risk reduction, water security, biodiversity conservation, carbon storage and improved human well-being. They complement, but do not replace, the need for rapid reductions in greenhouse gas emissions.

Principles for Effective Implementation

Effective NbS should be locally appropriate, scientifically informed, inclusive and gender-responsive. They should respect environmental and social safeguards and consider the knowledge and needs of local communities and indigenous peoples. Collaboration among communities, government, researchers and other stakeholders is essential for long-term success.

The Way Forward

The UNEA resolution promotes sharing best practices, developing appropriate guidelines and strengthening sustainable investment in Nature-Based Solutions.

The key message is simple: healthy ecosystems are part of the solution. Protecting and restoring nature can help create a more resilient, equitable and sustainable future.

Source: United Nations Environment Assembly Resolution UNEP/EA.5/Res.5, 2 March 2022.



Climate Adaptation Actions in CMRL Projects

Vinoth Kumar R | AM Environment | CMRL

Climate change is increasingly influencing urban infrastructure through rising temperatures, intense rainfall, urban flooding, cyclones and sea-level rise. Recognising these emerging risks, CMRL has integrated climate adaptation measures into the planning, design, construction and operation of its metro rail projects. Climate change assessments for Phase II have considered key hazards, including extreme heat, heavy precipitation, cyclones, storm surges and sea-level rise, with suitable adaptation measures incorporated into project design.

Resilience to Extreme Heat

A major focus of CMRL's climate adaptation strategy is improving resilience to extreme heat. The use of head-hardened 1080-grade steel rails provides enhanced stiffness, lateral resistance, thermal stress management and durability. These rails help reduce the risk of track buckling, sun kinks and deformation under high temperatures, thereby improving track performance, reducing maintenance requirements and supporting operational reliability.

Flood and Inundation Resilience

Flood resilience is particularly important in Chennai due to intense rainfall, urban flooding, river flooding and sea-level rise. Flood gates, protective structures and flood barriers are planned at vulnerable underground stations. Raised station entrances, emergency staircases and shafts help prevent floodwater from entering underground facilities and support safe evacuation during extreme rainfall events.

The elevated configuration of substantial portions of the metro network also provides an important adaptation benefit by keeping tracks and stations above potential flood levels, thereby reducing the vulnerability of critical infrastructure to inundation.

Stormwater Management and Water Conservation

CMRL has adopted measures for rainwater harvesting, stormwater management and groundwater recharge. Rainwater harvesting systems are provided at stations and elevated corridors, while runoff from viaducts is channelled towards recharge pits. These measures help reduce surface runoff and localised flooding, promote groundwater recharge and conserve water for station requirements.

Preparedness and Continuity of Operations

Climate resilience also requires preparedness for extreme events and rapid recovery. Back-up pumping systems, standby generator sets and emergency maintenance equipment provide additional resilience during flooding, cyclones and climate-related power disruptions. These facilities help ensure that essential systems, including floodwater pumping and emergency operations, can continue functioning during disruptions.

Through these integrated measures, CMRL is strengthening the climate resilience, safety and reliability of Chennai Metro, while supporting continuity of essential public transportation and contributing to a more resilient and sustainable Chennai City.



India's Green Transformation

Saravanan P
AM Environment | CMRL

India's development journey over the past twelve years reflects a significant shift in the way economic growth and environmental stewardship are approached. The transformation is built around three interconnected ideas—Vishwaas, Nirman and Jan Kalyaan—with ecological security increasingly recognised as a foundation for long-term growth, resilience and public welfare.

A visible aspect of this transformation is the expansion and restoration of India's ecological assets. Forest and tree cover now accounts for 25.17% of the country's geographical area, supported by initiatives such as large-scale afforestation, Nagar Van and the Ek Ped Maa Ke Naam campaign. The Namami Gange Programme has adopted an integrated approach to river conservation through sewage treatment, pollution control, biodiversity conservation and afforestation. Wetland conservation has also expanded, with India's Ramsar sites increasing from 26 in 2014 to 99 by April 2026. Mangrove restoration and sustainable coastal management further recognise natural ecosystems as important assets for climate resilience.

India's wildlife conservation efforts provide another indicator of this progress. The tiger population increased from 2,226 in 2014 to 3,682 in 2022, while conservation programmes for lions, leopards, elephants and rhinoceroses have supported species recovery and habitat protection. Scientific monitoring, technology-based conservation and expanded protected landscapes are strengthening a shift towards landscape-level ecological management.

India is also building greater national capacity for sustainability. The solid waste processing rate increased from 17% in 2014 to over 77% by 2024, supported by material recovery facilities, biomethanation and waste-to-energy systems. Extended Producer Responsibility (EPR) frameworks are improving accountability for plastic, e-waste, batteries, tyres and other waste streams. Environmental education, green skills, digital monitoring and disaster-warning systems are further strengthening institutional capacity.

At the global level, India is taking an increasingly active role in environmental and climate leadership through initiatives such as the International Solar Alliance, Mission LiFE, Coalition for Disaster Resilient Infrastructure and International Big Cat Alliance. India has also reported achieving key climate commitments ahead of schedule, including its emissions-intensity reduction target and the target of 40% non-fossil electricity capacity. By February 2026, non-fossil sources accounted for 52.57% of installed power capacity.

India's green transformation is therefore more than tree planting or wildlife protection. It represents a broader transition in which environmental conservation, technology, public participation and economic development are increasingly interconnected. As India progresses towards the vision of Viksit Bharat, sustainability will remain central to ensuring growth that is cleaner, more resilient, inclusive and environmentally responsible.



A Day Without a Drop

Jayaprasand

Natural Environmental Specialist - NKAB

It is 6 a.m. in a Chennai apartment. The first sound of the day is not flowing water, but the repeated turning of a tap that produces nothing but air. The overhead tank is empty, and the sump below is drier still. Down the street, residents gather around a blue water tanker, waiting with buckets and pots.

Now imagine this happening across Chennai for just one day. No water for morning coffee, cooking, bathing or cleaning. Restaurants close, offices are disrupted and even essential public facilities struggle to function. A city of millions comes to a standstill because there is one resource for which there is no substitute: water.

A Crisis Chennai Has Seen Before

Chennai has experienced severe water stress before. During the summer of 2019, the city's four major reservoirs—Poondi, Cholavaram, Puzhal and Chembarambakkam—fell to critically low levels following consecutive weak monsoons. Households became heavily dependent on water tankers, while businesses and daily activities were significantly affected.

Other cities have faced similar challenges. Cape Town came close to its much-feared “Day Zero” in 2018, while Bengaluru experienced severe water stress in 2024, with many borewells running dry. These experiences demonstrate that water conservation, rainwater harvesting and groundwater recharge must be undertaken before a crisis occurs.

Chennai is particularly vulnerable because it faces both floods and droughts. While intense rainfall can cause widespread flooding, inadequate rainfall can quickly reduce reservoir levels and groundwater availability. Protecting and replenishing groundwater is therefore essential for long-term water security.

Building Water Resilience

The imagined dry tap also highlights the importance of institutional action. CMRL has incorporated several measures to reduce water consumption and improve water resilience across its facilities.

Rainwater harvesting systems are provided at stations, depots and other facilities to capture rainwater and support groundwater recharge. Low-flow plumbing fixtures help reduce water consumption, while condensate generated from air-conditioning systems at the CMRL Administrative Building is collected and reused, helping recover valuable quantities of water.

Construction activities also utilise treated water supplied by the city's water utility, thereby reducing dependence on freshwater resources. Together, these measures demonstrate how water efficiency, reuse and conservation can be integrated into infrastructure planning and operations.

Every Drop Matters

A “Day Without a Drop” may remain a hypothetical scenario, but the warning is real. Water security cannot be created during a crisis; it must be built well before one begins.

For a city facing both droughts and floods, every drop saved, reused or recharged contributes to resilience. The next time a tap is opened at 6 a.m., perhaps the question should not be whether it will run dry, but what we can do today to ensure that it never does.

Ecological Importance of the Dead Trees

Sivaraman P | Env. Monitoring Specialist | NKAB

A tree may stop growing when it dies, but its ecological role does not end. Standing dead trees, fallen logs, stumps and decaying branches are natural and important components of healthy forest and urban ecosystems. Although they may appear lifeless, they continue to provide food, shelter and breeding habitats for birds, insects, mammals, fungi and microorganisms. They also contribute to nutrient cycling, soil health, biodiversity and carbon storage.

Creating Space for New Growth

The death of a tree can create favourable conditions for new vegetation. As the tree declines, gaps in the canopy allow more sunlight to reach the forest floor, supporting seed germination and natural regeneration. As the tree gradually decomposes, nutrients stored in its biomass are released back into the soil and become available to surrounding plants. In this way, the death of one tree can initiate a new cycle of growth and regeneration.

Supporting Wildlife

Standing dead trees, commonly known as snags, provide valuable habitats for a wide range of wildlife. Wood-boring insects, including beetles and ants, colonise decaying wood and become an important food source for insect-eating birds. Cavities created by woodpeckers and other organisms provide nesting and shelter for birds, bats, squirrels and other small animals.

As decomposition progresses, new cavities, cracks and crevices develop, increasing the variety of habitats available to different species. Thus, a dead tree can continue to support wildlife for many years.

Soil Enrichment and Nutrient Cycling

Dead wood plays an important role in nutrient cycling. Fungi, bacteria and other microorganisms gradually break down the organic matter and release nutrients such as nitrogen, phosphorus and potassium into the soil. The organic matter produced during decomposition can improve soil structure, moisture retention and fertility, creating favourable conditions for new vegetation and maintaining ecosystem productivity.



Carbon Storage

Dead trees are also an important part of the forest carbon cycle. A significant amount of carbon remains stored in dead wood during the decomposition process. Some of this carbon becomes incorporated into the soil as organic matter, while the remaining carbon is gradually released through natural decomposition. Dead wood therefore contributes to the long-term functioning of forest ecosystems and the natural cycling of carbon.

Supporting Biodiversity and Microhabitats

Fallen logs, stumps and decaying branches add structural complexity to the landscape and create numerous microhabitats. They provide refuge for insects and small animals and support the growth of mosses, lichens and fungi. These varied habitats encourage interactions between different species and contribute to overall biodiversity.

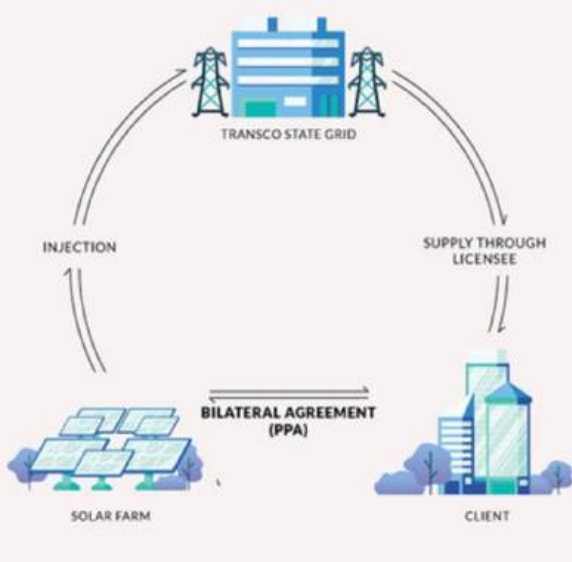
Nurse Logs and Natural Regeneration

Fallen tree trunks can also serve as nurse logs, providing favourable conditions for the establishment of young plants. Their decaying wood can retain moisture and contain nutrients, creating suitable microsites for seeds to germinate and seedlings to grow. In natural forests, nurse logs can therefore play an important role in regeneration.

Conclusion

Dead trees are not simply waste or useless vegetation. They are an essential part of the natural cycle of life and regeneration. By providing habitat, enriching soil, supporting biodiversity, storing carbon and facilitating new growth, they continue to perform important ecological functions long after their death.

Where safety considerations permit, retaining suitable dead wood and standing dead trees can therefore contribute significantly to responsible biodiversity conservation and ecosystem management.



Solar Energy Open Access

Selvendiran K
Sr. Env. Manager - NKAB

The CMRL Project has achieved a significant sustainability milestone through the successful implementation of a Solar Energy Open Access Initiative, reinforcing its commitment to clean energy, resource efficiency and environmentally responsible construction practices.

As part of this initiative, the Precasting Yard and Batching Plant at CP10 EV03, operating under an HT electricity connection, shifted a substantial portion of their electricity consumption from conventional grid power to renewable solar energy through the open access mechanism. Approximately 5 lakh units of electricity were sourced from solar energy, meeting nearly 85% of the facility's total electricity requirement through clean and renewable energy.

This transition demonstrates how renewable energy can be effectively integrated into energy-intensive construction facilities. By adopting the open access mechanism, the project has reduced its dependence on conventional electricity sources while improving the overall environmental performance of its construction operations.

Advancing Climate Action

The initiative has delivered measurable environmental benefits by reducing greenhouse gas emissions. The use of renewable solar energy has helped avoid approximately 350 tCO₂e of greenhouse gas emissions, contributing to climate change mitigation and supporting India's transition towards a low-carbon and sustainable energy future.

The initiative also highlights the importance of addressing energy consumption during the construction phase. While metro rail systems provide long-term environmental benefits through sustainable mass transportation, the use of renewable energy during construction further strengthens the project's overall sustainability performance.

A Model for Sustainable Construction

The successful implementation of solar energy open access at CP10 EV03 reflects CMRL's proactive approach towards energy conservation, carbon reduction and operational efficiency. It demonstrates that innovative energy management practices can complement other sustainability measures and deliver tangible environmental benefits.

The experience can also serve as a potential model for other high-energy construction facilities, including precasting yards, batching plants and project installations, where renewable energy can help reduce operational carbon footprints.

Looking Ahead

This initiative reflects CMRL's continued efforts to integrate sustainability into every stage of metro rail development. By adopting renewable energy, reducing greenhouse gas emissions and promoting resource-efficient practices, CMRL is contributing to the development of greener, climate-resilient and future-ready metro infrastructure.



Conservation of Trees in Project Alignment

Jeyaprabha B S | Environment Engineer | AEON

Sustainable infrastructure development begins with the principle of avoidance and minimization of environmental impacts. During the planning and construction of the viaduct, an existing tree located within the vicinity of the alignment was carefully assessed. Through appropriate design optimization and construction planning, the tree was successfully retained in situ, thereby avoiding unnecessary felling and conserving established vegetation within the project corridor.

Root Zone and Canopy Protection

Following the decision to retain the tree, construction activities were carefully managed to minimize disturbance to its root zone and canopy. Measures were adopted to prevent damage from excavation, material storage, equipment movement and other construction activities in the vicinity of the tree. Maintaining adequate protection around the tree helped safeguard its structural stability and physiological health during construction.

Minimizing Environmental Impact

Retention of the tree significantly reduced the direct impact of construction on existing vegetation. In addition to preserving established canopy cover, the retained tree continues to provide important environmental benefits, including carbon storage, shade, air-quality improvement and habitat for urban biodiversity. Such interventions contribute to maintaining ecological functions within a rapidly developing urban environment.

Environmental Management and Monitoring

The retained tree is periodically monitored throughout the construction period for signs of physical damage, canopy deterioration, soil compaction, root-zone disturbance and other indicators of stress. Any adverse impacts identified during monitoring are addressed through appropriate arboricultural and site-management measures to support the tree's long-term survival.

Sustainable Infrastructure Development

The successful retention of the tree demonstrates how design optimization and environmentally sensitive construction practices can integrate infrastructure development with urban ecological conservation. Wherever technically and operationally feasible, preserving existing trees should be prioritized over felling, while ensuring that the required engineering, safety and construction standards are fully maintained.

Conclusion

The successful retention of the tree through alignment and design optimization, careful construction planning and protection of its canopy and root zone demonstrates CMRL's commitment to minimizing environmental impacts during viaduct construction. Such practices not only avoid unnecessary tree felling but also preserve established ecological functions and contribute to more sustainable and climate-resilient urban infrastructure.



CMRL has been honoured with the Gold Award in the Environmental Improvement Category at the prestigious Commonwealth Environment & CSR Awards 2026. Thiru T. Archunan, Director (Projects), received the award on behalf of CMRL at the ceremony held on 30 July 2026 in Glasgow, UK.

[Pic. 1] Thiru M. A. Siddique, Managing Director, Thiru T. Archunan, Director (Projects), and Dr. Rajeev K. Srivastava, Chief Advisor (Environment), celebrating the achievement.

Awards and Recognitions



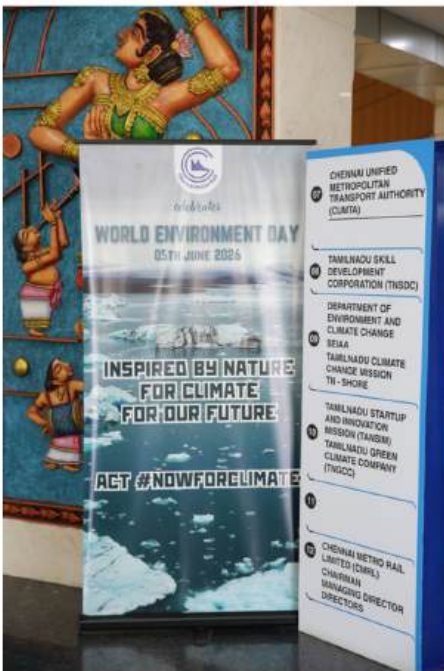
CMRL has been honoured with the prestigious Global Environmental Leadership Project of the Year 2026 Award at the Global Energy Leaders Summit 2026, held on 22nd May 2026 in New Delhi, India. Dr. Rajeev K Srivastava, Chief Advisor (Environment), and Mr. Saravana Kumar R, Manager (Environment), received the award on behalf of Chennai Metro Rail Limited.

CMRL conducted a pre-monsoon survey of the Phase II compensatory plantation and tree transplantation sites to assess the survival rate, general health of saplings and trees, and the status of maintenance activities. The survey recorded an overall survival rate of 87% for the Phase II compensatory plantations.

Celebrating WORLD ENVIRONMENT DAY 2026



[Pic. 1] Director (Systems & Operations) planting a sapling during the plantation drive organized at MetroS HQ.
[Pic. 2] Director (Systems & Operations) and Chief Advisor (Environment) taking the Climate Action Pledge.



CMRL and GC Environment Teams celebrating the World Environment Day and taking the Climate Action Pledge at the photo booth.

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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