CHENNAI METRO RAIL LIMITED

ENVIRONMENT NEWSLETTER

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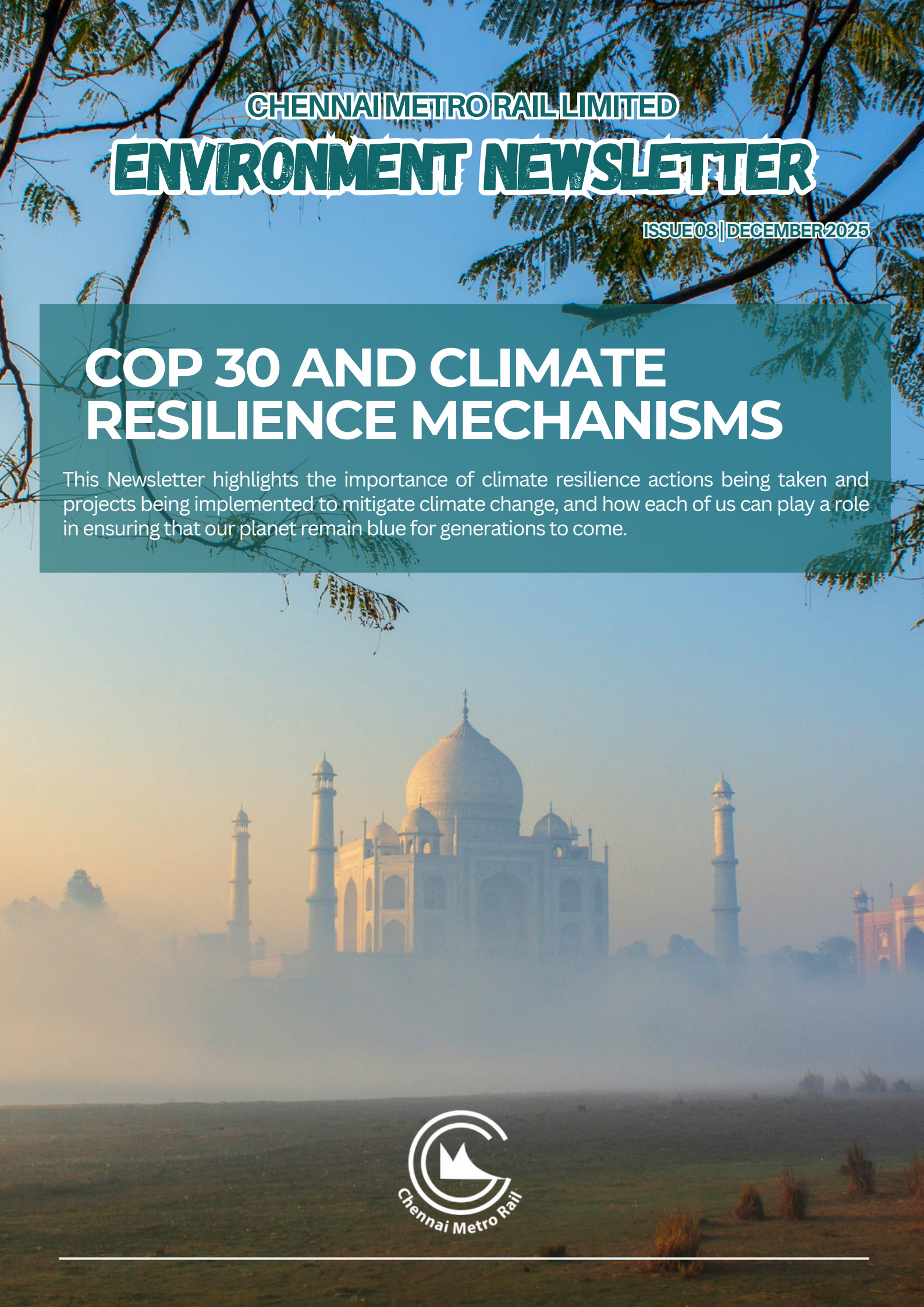
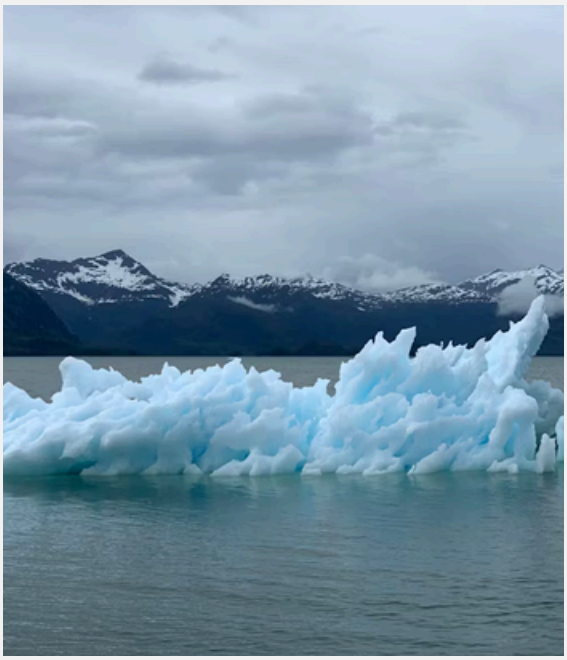
COP 30 AND CLIMATE RESILIENCE MECHANISMS

This Newsletter highlights the importance of climate resilience actions being taken and projects being implemented to mitigate climate change, and how each of us can play a role in ensuring that our planet remain blue for generations to come.





COP30 CONFERENCE OF PARTIES

The Conference of the Parties (COP) is the annual global climate summit held under the United Nations Framework Convention on Climate Change (UNFCCC). It brings together nearly all countries to assess progress on climate commitments, negotiate new actions, and strengthen global cooperation on mitigation, adaptation, climate finance, technology transfer, and capacity building. COP meetings are central to advancing the goals of the Paris Agreement and shaping the world's collective response to climate change.

COP30, held in Belém, Brazil, in November 2025, placed global attention on the Amazon, Indigenous communities, biodiversity, and the need for climate justice. Countries, scientists, civil society, and global leaders gathered to accelerate action in a decade marked by intensifying climate impacts.

The summit delivered mixed outcomes. A major achievement was the agreement to triple adaptation finance for developing and climate-vulnerable nations, helping them cope with heatwaves, floods, sea-level rise, and other climate impacts. COP30 also adopted a Just Transition mechanism to support workers and communities shifting away from fossil-fuel economies.

However, the conference failed to secure a binding global roadmap to phase out fossil fuels and did not reach a mandatory agreement on ending deforestation. These gaps highlighted continuing global divisions and the urgent need for stronger, science-aligned climate commitments in future COPs.

PREFACE

It is my pleasure to present this special edition of the CMRL Environment Newsletter, centered on the global discourse on climate change and the principles of COP30. As the world prepares to convene in Belém, we stand at a critical moment that calls for faster, inclusive, and science-based climate action. For India and for climate-sensitive regions like Tamil Nadu, these principles are not aspirational—they are essential to how we plan and operate urban infrastructure.

At CMRL, sustainability is the core of our development approach. As we expand the metro network, we remain committed to reducing emissions, enhancing resilience, conserving resources, restoring ecosystems, and ensuring social equity. Our initiatives—from renewable energy integration and responsible construction to green cover enhancement and community-focused environmental programmes—demonstrate our continued contribution to India's climate goals.

This edition highlights key insights on climate risks, global trends, and actionable strategies relevant to national priorities and the urban mobility sector. It underscores the need for collective effort while pointing to opportunities for innovation and leadership. I appreciate the Environment Team for bringing together this timely publication.

As we move forward, let us stay aligned with global climate goals and continue advancing sustainable mobility for a greener, more resilient Chennai.

Dr. Rajeev K Srivastava I.F.S (Retd.)
Chief Advisor Environment

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COP30 | From Commitments to Climate Actions

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COP30, the 30th United Nations Climate Change Conference held in Belém, Brazil from 10–21 November 2025, marked a decisive shift in global climate governance. Held amid accelerating climate impacts and geopolitical challenges, the conference moved the global dialogue beyond aspirational pledges toward practical, measurable, and inclusive implementation. COP30 reinforced the message that climate goals can only be achieved through concrete action on the ground.

A key outcome of the conference was the launch of the Global Mutirão framework, which promotes collective action, cooperation, and shared responsibility among nations, institutions, and communities. The framework recognises climate change as a shared global challenge that requires coordinated solutions across sectors and borders. Complementing this, COP30 adopted the Just Transition Mechanism (Belém Action Mechanism) to support workers and communities affected by the transition away from fossil-fuel-based economies, ensuring that climate action remains socially equitable.

Accelerating the transition away from fossil fuels was a central theme of COP30. Countries are committed to reducing reliance on coal, oil, and gas while scaling up renewable energy sources such as solar, wind, and green hydrogen. Emphasis was placed on modernising energy systems, improving efficiency, and deploying energy storage. Across sectors, this transition is visible through the retirement of coal-based power plants, electrification of transport, expansion of public transit, adoption of low-carbon industrial processes, and promotion of climate-resilient agriculture and energy-efficient buildings.

COP30 reaffirmed four guiding principles for global climate action: strengthening multilateral cooperation under the Paris Agreement; ensuring climate policies deliver real benefits to people through environmental justice and inclusion; prioritising implementation over promises; and adopting a holistic approach that links climate action with public health, biodiversity, and economic development.

To enhance accountability, COP30 introduced the Global Implementation Tracker, complementing existing monitoring tools. These systems help assess progress, identify gaps, mobilise finance, and ensure that no community is left behind.

In conclusion, COP30 represents a turning point in international climate efforts. By prioritising implementation, justice, and collective action, the conference laid a strong foundation for closing the gap between ambition and reality while keeping the 1.5°C goal within reach.

Climate Finance

Goals, Debates, and Commitments.

Climate finance emerged as the defining pillar of COP30 held in Belém, Brazil, with negotiators repeatedly describing it as the “lifeblood of climate action.” As climate impacts intensify across the Global South, the summit sought to bridge the persistent gap between climate ambition and the financial resources required to deliver real outcomes on the ground. COP30 reaffirmed a global commitment to mobilise USD 1.3 trillion annually by 2035 for developing countries, including a significant tripling of adaptation finance, sending a crucial political signal to address climate vulnerability.

A major outcome of the summit was the Belém Package, which emphasised scaling up both public and private climate finance while strengthening accountability and transparency. Central to this was the launch of the Global Climate Finance Accountability Framework, alongside a two-year work programme under Article 9.1 of the Paris Agreement to clarify the obligations of developed countries in providing financial support. COP30 also endorsed the Baku–Belém Roadmap, which sets out a coordinated strategy to mobilise finance from diverse sources, including multilateral development banks, private investors, and philanthropic institutions. To track progress, countries agreed on 59 indicators to assess adaptation outcomes across priority sectors.

Several notable pledges were announced during the summit. Six countries pledged USD 58.5 million to the Adaptation Fund, with Spain taking the lead. Brazil launched the Tropical Forests Forever Fund, securing USD 6.7 billion to protect tropical forests and support biodiversity. The Green Climate Fund (GCF) reported a record USD 3.26 billion in programming and introduced new regional platforms to ease access to climate finance. Meanwhile, the European Union disbursed USD 34 billion in climate finance in 2024, and multilateral development banks collectively pledged USD 137 billion for climate-related investments.

Despite these advances, COP30 exposed deep equity and political challenges. Developing nations highlighted the stark gap between current adaptation finance—around USD 26–28 billion annually—and the estimated USD 300–365 billion required each year. The African Group and Least Developed Countries called for 70% of finance as grants and 90% from public sources, while developed countries resisted binding targets, favouring blended finance and greater private sector participation.

UN Climate Chief Simon Stiell stressed that only “real finance, flowing fast and fair” can keep the 1.5°C goal within reach. While COP30 laid important groundwork, its success will ultimately depend on whether political commitments translate into timely, predictable, and adequate financial flows for those most affected by climate change

Climate Change in Tamil Nadu

Impacts, Vulnerabilities, and the Way Forward

Jayaprasand
Natural Environmental Specialist - NKAB

Climate change has emerged as one of the most pressing challenges of our time, and Tamil Nadu stands at the forefront of its impacts. As one of India's most urbanized and industrialized states, with a long coastline, dense population, and agriculture-dependent communities, Tamil Nadu is highly vulnerable to climate-induced disruptions. Rising temperatures, erratic monsoons, frequent cyclones, droughts, floods, and coastal erosion are increasingly shaping the state's environmental and socio-economic landscape.

Tamil Nadu experiences a tropical climate and relies heavily on the Northeast Monsoon, which provides nearly half of its annual rainfall. Any deviation in this short rainfall window directly affects water availability, agriculture, and urban systems. Over the past few decades, the state has warmed by nearly 1°C, resulting in frequent and intense heat waves. Cities like Chennai and Coimbatore experience urban heat island effects, increasing health risks, electricity demand, and stress on water resources. Vulnerable groups such as daily wage workers, the elderly, and slum dwellers face the greatest risks.

Rainfall patterns have become highly unpredictable, with short spells of intense rainfall causing severe urban flooding, while prolonged dry periods result in water scarcity. Recurring floods in Chennai and other coastal districts have exposed gaps in urban planning, drainage infrastructure, and wetland protection. At the same time, Tamil Nadu faces chronic drought and groundwater depletion, forcing rural populations to migrate in search of water and livelihoods.

The state's 1,076-km coastline is under increasing threat from sea-level rise, coastal erosion, and saltwater intrusion. Fishing communities are losing livelihoods, mangroves are degrading, and coastal infrastructure faces growing risks from storm surges and cyclones. Cyclones in the Bay of Bengal have become more intense and unpredictable, causing widespread damage to homes, agriculture, power systems, and transport networks.

Climate change affects all major sectors, including agriculture, water resources, industry, infrastructure, and public health. In response, Tamil Nadu has taken notable steps through renewable energy leadership, rainwater harvesting, waterbody restoration, climate-resilient infrastructure, mangrove expansion, and disaster preparedness systems.

Looking ahead, strengthening climate forecasting, promoting resilient agriculture, expanding water recycling, reducing emissions, and encouraging citizen participation are essential. Addressing climate change requires coordinated action across government, industry, and society to secure a sustainable and resilient future for Tamil Nadu.

A sustainable future of metropolitan cities through Water Neutrality

Water is life's matter and matrix, mother and medium. There is no life without water

Sivaraman P
Environmental Monitoring Specialist
NKAB

Water neutrality is emerging as a critical goal for sustainable urban development. It ensures that total water consumption is balanced with measurable water savings and replenishment within the same watershed, resulting in zero net impact on local water resources. This concept is especially vital for fast-growing Indian metro cities like Chennai, Delhi, Bengaluru, and Hyderabad, which face extreme water stress and rapidly depleting groundwater reserves.

India has witnessed repeated water crises. During 2018–2019, mega cities such as Chennai and Bengaluru approached “Day Zero,” highlighting the severity of the national water emergency. In 2019, drought affected nearly 330 million people. Groundwater remains India’s primary source, meeting 85% of rural, 48% of urban, and 70% of agricultural needs. The 2018 Composite Water Management Index (CWMI) by NITI Aayog warned that 21 major cities would reach zero groundwater levels by 2020, impacting 100 million people, while 12% of the population is already living with Day Zero–like conditions. By 2030, India’s water demand is projected to be double the available supply.

Water neutrality is built on three core steps. First, the total water footprint—covering direct and indirect water use—must be measured. Second, consumption should be reduced through efficiency measures like low-flow fixtures, leak detection, smart meters, and behavioural changes.

Third, unavoidable consumption must be replenished through rainwater harvesting, wastewater recycling, restoration of water bodies, and groundwater recharge.

Metro cities face multiple challenges: Rapid population growth that strains infrastructure, climate-induced rainfall variability, weak enforcement of water regulations, and contamination and over-extraction of groundwater. Addressing these issues requires a combination of policy reform, infrastructure upgrades, and community engagement.

Key strategies include Integrated Water Resource Management (IWRM), which considers the entire water cycle; strengthening governance and regulatory frameworks; mandating water-efficient designs in all new developments; and retrofitting existing buildings with conservation technologies. Innovative solutions such as smart irrigation, AI-based leak detection, advanced wastewater treatment, and atmospheric water generators can further support water security. Public awareness campaigns also play a crucial role in promoting responsible water use.

In conclusion, achieving water neutrality is essential for building resilient and sustainable metropolitan cities. It demands a holistic, collaborative approach that combines technology, policy, and citizen participation to ensure that water consumed is balanced with water replenished, securing India’s urban future.

Integrating Ecology, Equity, and Livelihood through Compensatory Plantation

Ram Singh
Environment Expert
AEON

Chennai Metro Rail has introduced an innovative compensatory plantation programme that links ecological restoration with inclusive livelihood generation. As Phase 2 requires the removal of about 6,000 trees, the initiative focuses on restoring native green cover while creating dignified jobs for vulnerable communities across Chennai.

The programme strengthens local nurseries, enables large-scale native sapling production, and ensures structured planting and long-term maintenance. Women's SHGs, unemployed youth, informal workers, and nearby residents participate throughout the process, improving survival rates and fostering community ownership. This approach transforms compensatory plantation from a regulatory task into a socially inclusive model.

Objective Analysis

The objective is to turn mandatory plantation requirements into a platform for socio-economic inclusion and climate resilience. Unlike traditional contractor-driven models, CMRL's approach embeds equity, livelihood support, and skill development at every stage.

1. Livelihood Integration through Sapling Production: To meet the 1:12 compensatory ratio, CMRL enabled the production of nearly one lakh native saplings through nurseries run by women's SHGs and unemployed youth. Training on propagation, native species, and nursery management strengthened local supply chains and provided stable income for low-income households.

2. Equitable and Decent Employment: Plantation and maintenance activities employed the local community under fair-wage systems with transparent payments and grievance redressal. A 40% quota for women and priority for informal workers ensured inclusive and dignified livelihood opportunities.

3. Long-Term Maintenance: A structured 2.5-year maintenance cycle across 60 sites provides steady employment for daily tasks such as watering, mulching, pruning, and gap-filling, improving survival rates and job continuity.

4. Community Engagement and Monitoring Local committees assisted in site identification, monitoring, and verification. Geo-tagged photos and regular inspections improved accountability, reduced vandalism, and fostered community stewardship.

5. Ecological Impact: Achieving a 95% survival rate, the initiative enhances native green cover, improves microclimate conditions, boosts biodiversity, and contributes to Chennai's climate resilience goals.

CMRL's compensatory plantation programme demonstrates how environmental compliance can evolve into a people-centred, job-creating model. Through inclusive employment, community engagement, skill development, and long-term maintenance, the programme delivers both socio-economic benefits and ecological gains.





Post-Fire Succession and Regrowth of Indigenous Species at CMRL Compensatory Plantation Site

Jeyaprathiba B S
Environment Engineer
AEON

Compensatory plantations play a critical role in restoring ecological balance by offsetting vegetation loss caused by infrastructure development. A recent fire incident at the Chennai Metro Rail Limited (CMRL) compensatory plantation site in Tamil Nadu, which affected approximately 600 indigenous saplings, provided an opportunity to assess the ecological resilience and regenerative capacity of native species. While the fire resulted in the temporary loss of above-ground biomass, post-incident assessments indicate strong potential for natural recovery through well-established post-fire succession processes

Post-fire succession is a predictable ecological process that begins immediately after a disturbance. Following the fire, a thin ash layer formed from burnt biomass enriched the soil with essential nutrients such as potassium, phosphorus, and calcium. These nutrients act as natural fertilizers, supporting rapid vegetation recovery. Although fire initially dries the soil, rainfall and ambient humidity soon restore soil moisture and normalize temperature, creating favorable conditions for germination and regrowth.

A significant factor contributing to recovery at the CMRL site is the use of indigenous, fire-resilient species. Native trees such as neem (Azadirachta indica), pungam (Pongamia pinnata), and poovarasu (Thespesia populnea) possess strong regenerative mechanisms. Many of these species resprout from underground rootstocks, rhizomes, lignotubers, or basal buds, enabling visible regeneration within weeks of the fire. This resprouting ability highlights the adaptive advantage of native species in responding to environmental stressors.

The soil seed bank also plays a vital role in early succession. Seeds from previous plantation cycles often survive fire events, and heat exposure helps break seed dormancy. Supported by ash-derived nutrients, pioneer grasses and herbaceous species are among the first to establish. The removal of canopy cover allows increased sunlight to reach the soil surface, creating open space for fast-growing pioneers. These early colonizers stabilize the soil, reduce erosion, and prepare the site for subsequent stages of vegetation recovery.

Over a period of three to twelve months, shrubs and young trees regenerate from surviving root systems, gradually re-establishing canopy structure. Within one to three years, native tree species regain height and spread, while herb and shrub layers stabilize. This progression supports increased biodiversity and restores the plantation's ecological functions.

The observed post-fire regeneration at the CMRL compensatory plantation site is a positive indicator of ecosystem health. It demonstrates that the plantation is functioning effectively as a restoration system, with species well-suited to local soil and climatic conditions. The successful recovery reinforces the importance of selecting native species for urban ecological restoration. CMRL's approach reflects a strong commitment to environmental stewardship and sets a valuable benchmark for sustainable urban infrastructure development in Chennai.

CMRL wins GLOBAL SUSTAINABLE URBAN MOBILITY PROJECT OF THE YEAR 2025 AWARD

The award was presented to CMRL in front of a global audience. In a felicitation ceremony held at MetroS, the award was formally handed over to Shri M. A. Siddique, Managing Director, CMRL, in the presence of senior officials, including Shri T. Archunan (Director – Projects), Dr. Rajeev K. Srivastava (Chief Advisor – Environment), and other dignitaries.

ONE-DAY ENVIRONMENTAL TRAINING PROGRAMME

A One-Day Environmental Training Programme was conducted on 26th November 2025, to strengthen the understanding on MDB's Environmental and Social Safeguards. The programme was attended by environmental and social personnel from contractors and General Consultants.

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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