



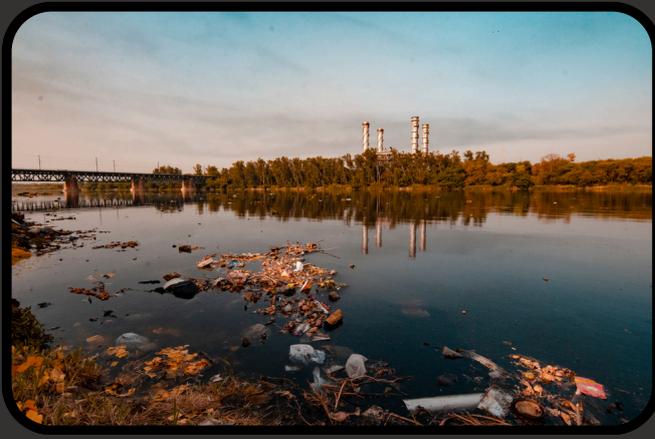
CHENNAI METRO RAIL LIMITED

ENVIRONMENT NEWSLETTER

ISSUE 07 | JULY 2025

**SAY NO
TO PLASTIC** **YES
TO PLANET**

This newsletter highlights the importance of protecting ecosystems, reducing plastic pollution, and the ongoing efforts to create a cleaner environment. It emphasizes how simple actions like refusing single use plastics and choosing sustainable alternatives can significantly reduce environmental harm. Together, we can support the health of our planet and ensure that our land, oceans, and communities remain vibrant and pollution free for generations to come.



Welcome to the latest edition of the Environment Newsletter. In this issue, we focus on a critical topic that affects us all:

Plastic pollution is a growing threat to our environment, harming ecosystems, wildlife, and human health.



SAY NO TO PLASTIC - YES TO PLANET

As a service provider of sustainable urban transport, CMRL is committed to reducing plastic use and promoting eco-friendly alternatives across all its operations. Together, let's recognize the importance of minimizing plastic waste, explore the steps being taken to tackle this challenge, and discover how each of us can contribute to building a cleaner, plastic free future. Small changes today will protect our planet for generations to come.



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PREFACE

The health of our water ecosystems rivers, lakes, oceans, and groundwater stands at a critical juncture. Increasing levels of marine and freshwater pollution, particularly from plastic and microplastic contaminants, pose a growing threat to biodiversity, public health, and food security. These pollutants not only degrade aquatic habitats but also enter the food chain, affecting human populations in insidious and far reaching ways.

This edition of our newsletter focuses on the urgent environmental challenges posed by marine pollution, inland water pollution, and the pervasive spread of microplastics. These issues demand collective responsibility and sustained action. From industrial discharge and urban runoff to improper waste disposal, the causes are as complex as the solutions are urgent.

At the heart of any meaningful change lies capacity building and awareness. By equipping stakeholders from civic bodies and policymakers to local communities and youth with the knowledge and tools to act, we can foster more responsible and sustainable environment. The goal is not just to manage pollution, but to prevent it, through innovation, regulation, and informed citizen participation.

Let this newsletter serve as both a source of knowledge and a call to action. Together, we must build resilient systems, inspire behavioural change, and empower each individual to become an advocate for our blue planet.

Dr. Rajeev K. Srivastava
Chief Advisor [Environment and Gender]

BIOREMEDIATION OF CONTAMINATED SITES

Saravana Kumar R | Manager
Environment | CMRL



Bioremediation is a method that uses microorganisms, plants, or fungi to clean polluted soil, water, or air. These natural helpers break down harmful chemicals into safer substances. It is eco-friendly, cost effective, and often safer than using chemicals or machines.

EXAMPLE

Location: Tondiarpet, Chennai

Pollution Type: Petroleum hydrocarbon (from oil storage leaks)

Project By: IOCL (Indian Oil Corporation Ltd) and NEERI

What Happened?

A large area of groundwater was polluted by oil leakage from underground tanks. The National Environmental Engineering Research Institute (NEERI) applied bioremediation by injecting oil eating bacteria into the soil.

Result: Over time, the bacteria broke down the oil into harmless substances, reducing pollution levels and restoring water quality.

Is Bioremediation Safe?

Bioremediation relies on microbes that live naturally in soil and groundwater. These microbes pose no threat to your community. Microbes added for bioaugmentation typically die off once contaminants and proper conditions are gone. The chemicals added to stimulate bioremediation also are safe. To ensure that bioremediation is working and to measure progress, samples of soil and groundwater are tested regularly

Types of Bioremediation

- **Microbial Bioremediation** (uses bacteria)

Pseudomonas : breaks down oil and fuel

Bacillus : removes heavy metals like lead

- **Phytoremediation** (uses plants)

Sunflower : absorbs toxic metals

Vetiver grass : cleans soil with heavy metal pollution

- **Mycoremediation** (uses fungi)

White rot fungus : removes dyes and pesticides

Aspergillus : absorbs harmful metals

- **Bio-venting** (adds air to soil to help microbes grow)

Used to clean oil spills in soil

Helps bacteria like Pseudomonas break down fuel

- **Bio-piles** (piles of polluted soil treated with microbes)

Acinetobacter : treats oil contaminated soil

Nocardia : breaks down hydrocarbons

Conclusion

Bioremediation is a smart way to clean the environment using nature. It has already helped clean polluted sites like Tondiarpet in Chennai.

With more awareness and support, bioremediation can be used across Tamil Nadu and India to make our land and water clean and safe again.

PLASTIC WASTE TO CLEAN HYDROGEN

Saravanan P | AM Environment | CMRL

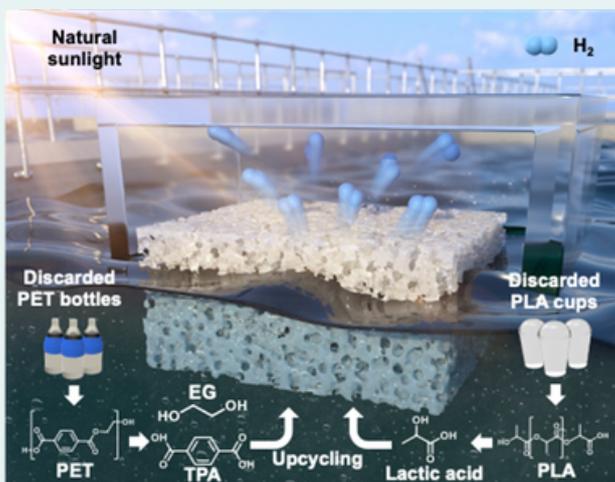
Turning Trash into Treasure – Using Sunlight

A pioneering research team at the Institute for Basic Science (IBS) in Korea, led by Professors Dae Hyeong Kim and Taeghwan Hyeon of Seoul National University, has developed a revolutionary technology that converts plastic waste into clean hydrogen fuel using only sunlight and water. This eco friendly method tackles two global challenges at once: plastic pollution and clean energy production.

The Science Made Simple

- Discarded plastics (like PET bottles and PLA cups) are dissolved in water.
- A sponge like floating catalyst, wrapped in a hydrogel polymer, absorbs sunlight and breaks down the plastics.
- This process releases hydrogen gas and yields useful byproducts such as ethylene glycol and terephthalic acid.

Unlike conventional hydrogen production methods (which use fossil fuels), this photocatalytic system works without emitting greenhouse gases and has been proven to work outdoors in real conditions for over two months even in seawater!



In a field test using a 1 m² solar device, the system:

- Successfully produced hydrogen under natural sunlight
- Remained stable across changing temperatures and water sources
- Proved scalable to 10 or 100 m², enabling cost-effective, carbon free hydrogen

“This innovation turns waste into energy and brings us closer to a carbon-neutral future,” Prof. Kim Dae-Hyeong, Lead Researcher

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Media Contact: Prof. Dae-Hyeong Kim dkim98@snu.ac.kr

INSTITUTE FOR BASIC SCIENCE (IBS) | Advancing Science for a Better Tomorrow www.ibs.re.kr

TREES AS NATURE'S POLLUTION FILTERS

Vinoth Kumar R | AM Environment | CMRL

Urban trees, often seen as green decor, are in fact silent protectors constantly at work to clean our air and cool our cities.

They absorb dangerous pollutants, reduce dust, and improve overall air quality, making them vital allies in the fight against pollution. As cities expand and emissions rise, pollution tolerant trees have emerged as nature's most affordable, effective, and sustainable solution.

Pollution-Tolerant Trees in Action

Certain native tree species such as Neem, Peepal, Banyan, and Tamarind are known for their remarkable ability to absorb harmful pollutants like PM2.5, nitrogen oxides, sulphur dioxide, and ozone.

Their leaves, especially those with rough or hairy textures, are highly effective in trapping black carbon and dust, acting as natural filters in polluted urban environments.

Environmental Significance

These trees not only purify air but also cool the surroundings, reduce urban heat islands, and support biodiversity.

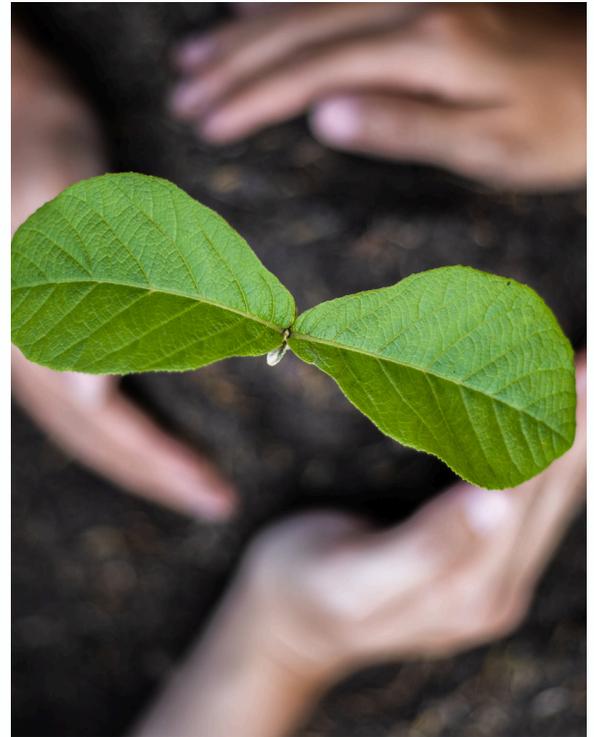
They act as carbon sinks, contribute to rainfall, and improve mental well-being in densely populated urban spaces. Leaf structure plays a critical role trees with waxy or hairy leaves can trap more pollutants per square metre than smooth-leafed species.

Conclusion

Trees are more than landscape features they are natural air filters.

In a world struggling with pollution and climate change, planting the right trees in the right places can double the benefits: cleaner air and healthier cities.

It's time we viewed urban forestry not as beautification, but as public health infrastructure.



The Science Behind Selection

Tools like the Air Pollution Tolerance Index (APTI) and Anticipated Performance Index (API) help identify tree species that are both pollution tolerant and ecologically suitable for urban environments.

These indices consider factors such as chlorophyll content, leaf pH, canopy structure, and moisture retention, ensuring that selected trees are not only resilient but also highly effective in filtering and surviving in polluted conditions.



MANAGING BIOMEDICAL WASTE RESPONSIBLY IN CHENNAI METRO CONSTRUCTION

Jayaprasad
Natural Environmental Specialist
NKAB

As Chennai Metro Rail Limited (CMRL) builds the city's metro system, it also manages an important task safely handling biomedical waste (BMW) from its construction sites. This waste comes from first aid clinics, labor camps, and emergency stations.

What is Biomedical Waste at Construction Sites?

BMW includes used bandages, blood stained cotton, gloves, masks, syringes, expired medicines, and broken glass vials. Though the amount is less than in hospitals, it still carries health risks and must be handled carefully.

Segregation Starts at the Source

At every CMRL worksite, waste is separated right at the point of generation using color coded bins:

- Yellow: infectious items like gauze and dressings
- Red: contaminated plastics
- White (Translucent): sharps like needles in puncture-proof containers
- Blue: broken glass and vials

All containers carry a biohazard symbol and are labeled with site and waste details, in line with CPCB and TNPCB rules.



Safe Storage and Disposal

CMRL stores biomedical waste (BMW) safely in closed, ventilated sheds for under 48 hours before sending it to authorized treatment facilities for incineration, autoclaving, or shredding. All partners are approved by TNPCB to ensure proper handling.

Challenges and the Way Forward

Construction sites and mobile clinics make consistent BMW management difficult. Strengthening clinic registration, conducting annual audits, and including BMW handling in site plans can improve compliance.

Towards a Cleaner Future

CMRL follows the 5Rs Refuse, Reduce, Reuse, Recycle, Recover to manage even small waste streams responsibly. As the metro expands, so does its focus on safe, sustainable practices.

ZERO WASTE TO LANDFILL FOR WASTE MINIMIZATION AND RESOURCE CONSERVATION

Sivaraman P
Environmental
Monitoring Specialist
NKAB

“Today, companies everywhere are focusing on sustainability.”

The idea of Zero Waste to Landfill (ZWTL) is gaining popularity as a smart, eco-friendly way to manage waste. Instead of dumping it, the focus is on reducing, reusing, and recycling to protect the planet and save resources.

The world now produces about 2.1 to 2.3 billion tonnes of solid waste every year. By 2050, this could increase to 3.4 billion tonnes. Waste from high income countries may rise by 19%, while in low income countries, it could more than triple.

Much of this waste ends up in landfills, which harm the environment and health. Landfills take up space, pollute soil and water, and release methane a greenhouse gas much more powerful than carbon dioxide.

Benefits of Zero Waste to Landfill for Businesses

- **Cost Savings:** Recycling and reusing reduce spending on raw materials and disposal.
- **More Jobs:** Green efforts like recycling and composting create employment.
- **Lower Pollution:** Less waste in landfills and incinerators means fewer harmful emissions.
- **Saving Resources:** Reuse helps conserve water, wood, minerals, and other natural materials.
- **Cleaner Environment:** Less burning and dumping leads to cleaner air and water.
- **Improved Health:** Reduced pollution means fewer health issues like asthma and allergies.
- **Eco Awareness:** Encourages people to live more sustainably.



Conclusion

Zero Waste to Landfill (ZWTL) is a smart and eco-friendly approach that protects the environment and uses resources better. It helps save money, improves a company's image, and supports long term growth. More than reducing waste, it promotes better ways to make, use, and dispose of products. In a time of climate change and increasing waste, ZWTL is a key step toward a cleaner, greener future.



WATER CONSERVATION DURING METRO CONSTRUCTION

Selvendiran K
Sr. Env. Manager
NKAB

Building Chennai Sustainably – A CMRL Initiative

As Chennai grows, water demand from homes, industries, and big projects is rising, leading to possible water shortages. To address this, Chennai Metro Rail Limited (CMRL) is taking steps to save water during metro construction.

1. Reducing Freshwater Use with Treated TTRO Water

CMRL uses Tertiary Treated Reverse Osmosis (TTRO) water from CMWSSB instead of freshwater for construction. It meets IS 456:2000 standards and is used for:

- Mixing concrete
- Piling work
- Curing structures
- Controlling dust

This helps cut freshwater use by nearly 70%, making it an eco-friendly choice.

2. Saving Water with Curing Compounds

Instead of using large amounts of water for concrete curing, CMRL uses curing compounds. These form a thin layer on fresh concrete to keep it moist and reduce water loss.

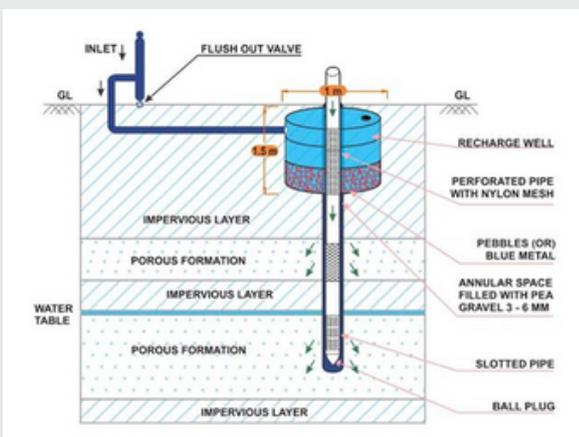
Benefits:

- 1 litre covers 4–6 m²
- Saves 80–100 litres of water per m²
- Reduces water use by up to 90%

3. Rainwater Harvesting & Borewell Recharge

Construction sites have rainwater harvesting systems to:

- Collect and reuse rainwater
- Reduce use of city water
- Recharge borewells and boost groundwater
- This helps meet water needs while supporting groundwater sustainability.



Moving Towards a Water-Secure Future

Through innovative practices such as TTRO water use, curing compounds, and rainwater harvesting, CMRL is leading by example in sustainable infrastructure development. These initiatives not only conserve freshwater but also ensure that the city's future infrastructure is environmentally responsible and resource efficient.

WORLD ENVIRONMENT DAY 2025



Chennai Metro Rail Limited (CMRL) proudly observed World Environment Day 2025 on 5th June 2025, aligning with the global theme **"Beat Plastic Pollution"**.

Mr. M.A. Siddique, I.A.S., Managing Director, Mr. S. Krishnamoorthy, IRAS, Director (Finance), Mr. Manoj Goyal, IRSEE, Director (Systems & Operations), Mr. Rajeev K. Srivastava, IFS (Retd.), Chief Advisor (Environment and Gender), Chief General Managers, and CMRL officials actively participated in the tree plantation on this wonderful occasion.

CMRL BAGS ENVIRONMENT AWARDS 2025



Global Environmental Excellence Award 2025 in Transportation Sector

Chennai Metro Rail Limited (CMRL) received the GEEF Global Environmental Excellence Award 2025 in the Transportation Sector.

In the photo, CMRL Managing Director Thiru M. A. Siddique, I.A.S., and Director - Projects Thiru T. Archunan, IRSE, celebrate the award with Dr. Rajeev K. Srivastava, IFS (Retd.), Chief Advisor (Environment & Gender).



Dr. Rajeev K. Srivastava (Chief Advisor - Environment & Gender) and Saravana Kumar R. (Manager - Environment) received the award on behalf of CMRL at the Global Energy Leaders' Summit 2025, held on 12th February at Roseate House, Aerocity, New Delhi.



Two prestigious Global GreenTech Environmental and Sustainability Awards 2025 by the Greentech Foundation for its outstanding achievements in the categories of Gender Equality and Environmental Protection. [In pic] Thiru M. A. Siddique, I.A.S., Managing Director, CMRL, in the esteemed presence of Thiru T. Archunan, IRSE., Director (Projects), Thiru S. Krishnamoorthy, IRAS., Director (Finance), Dr. Rajeev K. Srivastava, IFS (Retd.), Chief Advisor (Environment & Gender), Tmt. S. Rajalakshmi, AGM (Designs), Thiru. Saravana Kumar R, Manager (Environment)



Chennai Metro Rail Limited Bagged the Green Apple Awards for Environmental Best Practice 2025

RECOGNITIONS FROM PRESS AND MEDIA

CMRL wins twin awards for sustainability, gender equality

Over the past year, the agency has also stepped up its efforts in energy efficiency, water conservation, carbon emission reduction, and climate-resilient infrastructure planning.



M A Siddique, managing director of CMRL, received the awards at a ceremony attended by other senior officials including director (Projects) T Archunan, director (Finance) S Krishnamoorthy, and chief advisor (Environment & Gender) Dr Rajeev K Srivastava. Photo | Express

Express News Service

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CMRL bags global environmental excellence company award

As per CMRL press note, the award highlights outstanding organisations and teams who innovate environmentally-friendly ideas during any project implementation.

DTNEXT Bureau | 27 May 2025 7:26 PM



Chennai Metro Rail Limited

CHENNAI: The Chennai Metro Rail Limited (CMRL) has been recently awarded with

NEWS UPDATES 27-05-2025 BEHINDWOODS

சென்னை மெட்ரோ நிறுவனத்திற்கு உயரிய விருது!
சென்னை மெட்ரோ கிரமில் நிறுவனம் 2025-ஆம் ஆண்டுக்கான "உலகளாவிய சுற்றுச்சூழல் சிறப்பு நிறுவனம்" என்ற விருதைப் பெற்றுள்ளது. இந்த விருதை பெற்ற ஒரே மெட்ரோ நிறுவனம் சென்னை மெட்ரோ கிரமில் நிறுவனம் ஆகும்.



ENVIRONMENT TEAM CELEBRATING GREAT MOMENT

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