ISSN 2349-5596

GREEN INSIGHTS

Newsletter on "Environment Literacy - Eco-labelling and Eco-friendly Products"

April - June 2025, Vol. 20 No. 1

Sponsored by:
Ministry of Environment, Forest and Climate Change, Government of India
Environmental Information, Awareness, Capacity Building and Livelihood Programme (EIACP) Programme Centre, Resource Partner on:
Environment Literacy - Eco-labelling and Eco-friendly Products

Contents

Foreword

The path to ending plastic pollution lies in the convergence of scientific innovation, community participation, and strong policy frameworks. Breakthroughs in biodegradable materials, plastic-eating microbes, and advanced recycling technologies must be scaled up with the support of public and private investment. India's research ecosystem and start-up landscape offer a unique opportunity to develop indigenous solutions that are both cost-effective and environmentally sustainable. Collaboration between academia, industry, and government will be key to localizing global innovations for Indian conditions.

Equally vital is public engagement. Initiatives under Mission LiFE must continue to empower citizens to make conscious choices—from rejecting single-use plastics to embracing eco-friendly alternatives. Educational outreach, digital tools, and gamified learning models should be deployed widely to instill sustainable habits, especially among youth. Community-led clean-ups, citizen science, and inclusive awareness campaigns must become integral to national environmental strategy, ensuring that every household becomes a hub of sustainability.

Finally, robust implementation of policy measures such as the Plastic Waste Management Rules, EPR mandates, and plastic bans should be strengthened through enforcement, incentives, and innovation-friendly regulations. India must also play a leading role in shaping the forthcoming UN Treaty on Plastic Pollution, bringing perspectives from the Global South. Through a combination of innovation, inclusion, and intent, we can turn the tide on plastic and shape a cleaner, circular, and climate-resilient future for all.

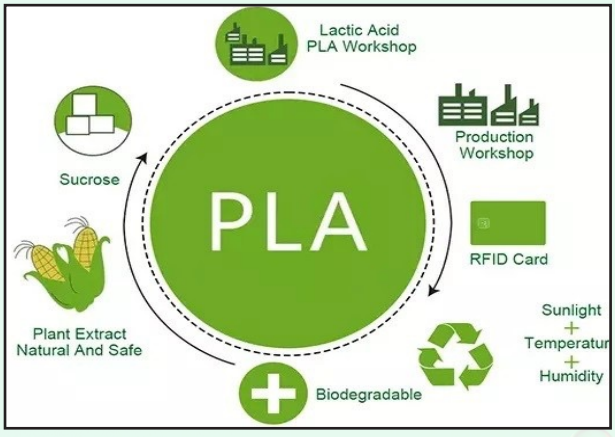
Turning the tide : Scientific Innovations to End Plastic Pollution

Plastic pollution has emerged as one of the most pressing environmental threats of the 21st century, with significant implications for ecosystems, public health, and climate stability. Every year, over 430 million tonnes of plastic are produced globally, with two-thirds turning into waste that finds its way into landfills, rivers, oceans, and even the food chain (UNEP, 2023). India alone generates more than 3.5 million tonnes of plastic waste annually, a substantial portion of which remains unmanaged or mismanaged (CPCB, 2023). As awareness about plastic pollution rises, science and technology have become key players in providing innovative and scalable solutions to mitigate its impact and promote sustainable alternatives.

Bioplastics and Biodegradable Alternatives

One of the most promising scientific developments is the rise of biodegradable plastics, which are made from renewable natural resources such as corn starch, cassava, sugarcane, algae, or even food waste. Unlike conventional plastics derived from petroleum, these bioplastics break down faster and have a smaller ecological footprint (Geyer et al., 2017).

For instance, Polylactic Acid (PLA) is a plant-based bioplastic used in packaging, disposable cutlery, and 3D printing. It decomposes into carbon dioxide and water under industrial composting conditions. Indian startups like EnviGreen and Earthware are already producing biodegradable bags and tableware using organic raw materials (EnviGreen, 2022; Earthware, 2023), offering a sustainable substitute to single-use plastics. However, challenges remain in terms of cost, composting infrastructure, and consumer awareness. Scaling up production, along with policy support such as Extended Producer Responsibility (EPR), can accelerate adoption and reduce dependency on petroleum-based plastics (MoEFCC, 2023).



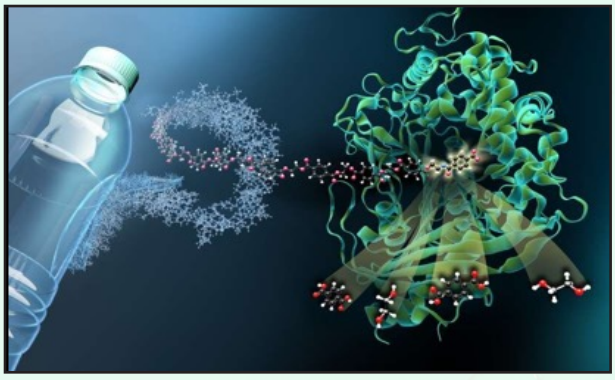
Plastic-Eating Enzymes and Microbes

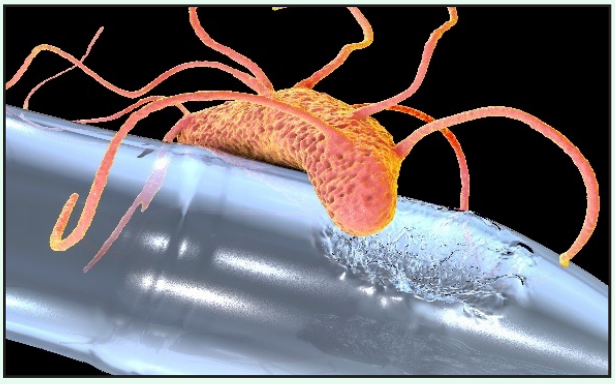
A revolutionary area of research involves the use of plastic-degrading enzymes and microbes. In 2016, scientists in Japan discovered a bacterium named Ideonella sakaiensis that can digest polyethylene terephthalate (PET), a common plastic used in bottles and clothing. This bacterium produces enzymes like PETase and MHETase that break down PET into its original building blocks, which can be reused to create new plastic—forming a closed-loop recycling system (National Geographic, 2019).

Further research has led to the development of engineered “super enzymes” that accelerate the degradation process at industrial scales. Recent advances in protein engineering, AI, and synthetic biology are enhancing the efficiency of such enzymes (Sharma & Chatterjee, 2020). Researchers in India are also exploring indigenous microbes from landfills, compost heaps, and cow dung, offering localized and low-cost solutions.

Indian consumers have the power to influence industries, demand sustainable products, and

advocate for environmental justice. As we prepare for WCRD 2025, let us harness the power of informed consumerism, grassroots advocacy, and collective action to secure a just transition that serves both humanity and the environment. The time to act is now.





Advanced Recycling Technologies

Traditional recycling methods are limited by contamination, material degradation, and economic feasibility. New technologies are addressing these challenges by making recycling more efficient, inclusive, and profitable.

- Mechanical Recycling 2.0 uses advanced filtration and cleaning to produce higher-quality recycled plastic, suitable even for food-grade uses (Startup India, 2024).
- Chemical Recycling, such as pyrolysis, solvolysis, and depolymerization, breaks down polymers into monomers that can be reused to create virgin-quality plastic. Pyrolysis, for instance, is being piloted in India by Indian Oil Corporation (IOCL, 2023).
- AI and Robotics in Waste Sorting: Smart systems powered by machine learning and robotic arms are being tested under the Smart Cities Mission in cities like Indore and Surat to sort plastic waste efficiently (Atal Innovation Mission, 2024).

In India, the adoption of these technologies remains in its early stages. However, innovation hubs like Atal Incubation Centres and startup ecosystems under Startup India are fostering home-grown innovations in plastic recycling and management.

रामभाऊ म्हाळगी प्रबोधिनी
Rambhau Mhalgi Prabodhini
ATAL INCUBATION CENTRE
Supported by Atal Innovation Mission, NITI Aayog

Circular Economy and Smart Packaging

Scientific innovation is also reshaping how we design, use, and reuse packaging. The circular economy model promotes keeping materials in use for as long as possible through reuse, repair, and recycling (UNEP, 2023).

Smart packaging integrates QR codes, RFID tags, and sensors to help track products and ensure proper disposal. Some Indian FMCG companies are exploring milk and detergent refill stations, edible packaging, and returnable containers, with digital platforms incentivizing customers for eco-conscious behavior (World Economic Forum, 2022).

(Source: https://www.packagingstrategies.com)

Citizen Science and Community Engagement

Digital tools are enabling citizen participation in combating plastic pollution. Mobile apps like Marine Debris Tracker, Clean Swell, and PlasticScore allow users to log litter, map hotspots, and monitor their environmental impact (Marine Debris Tracker, 2023; Ocean Conservancy, 2023; PlasticScore, 2023). In India, tools like the Swachh Bharat Mission Urban App and UNDP Plastic Waste Management App support real-time data collection and awareness campaigns (UNDP India, 2022; Swachh Bharat Mission, 2023). Community clean-ups, youth involvement, and behavioural change, supported by digital tools, are vital for success. Integrating these tools with Mission LiFE (Lifestyle for Environment) can build habits for sustainable living and reduce plastic use at the household level (NITI Aayog, 2023).

Policy and Innovation Synergy

Scientific innovation must work hand-in-hand with policy, regulation, and investment. India has made strides by banning 19 single-use plastic items from July 2022 and enforcing the Plastic Waste Management Rules (2016, amended 2022) (MoEFCC, 2022). EPR has been made mandatory for plastic producers and users. Globally, countries are negotiating a UN Treaty on Plastic Pollution, aimed at a legally binding agreement by 2025 (United Nations, 2024). India's role in shaping this treaty from the Global South is crucial. Innovations like plastic credits, blockchain traceability, and green bonds are emerging to finance the transition toward a circular economy (World Economic Forum, 2022).

References

1. Central Pollution Control Board. (2023). Annual report for plastic waste management for the year 2022–2023. Ministry of Environment, Forest and Climate Change, Government of India. Retrieved from https://cpcb.nic.in
2. Ministry of Environment, Forest and Climate Change. (2022). Plastic Waste Management (Amendment) Rules, 2022. Government of India. Retrieved from https://moef.gov.in
3. Ministry of Environment, Forest and Climate Change. (2023). Extended Producer Responsibility Guidelines. Government of India. Retrieved from https://moef.gov.in/wp-content/uploads/2023/03/EPR_Guidelines_Plastics.pdf
4. National Geographic. (2019). Meet the plastic-eating bacteria that could change the world. Retrieved from https://www.nationalgeographic.com/science/article/plastic-eating-bacteria-discovery-enzyme-pollution-waste
5. Ocean Conservancy. (2023). Clean Swell mobile app for coastal cleanups. Retrieved from https://oceanconservancy.org/trash-free-seas/clean-swell/
6. PlasticScore. (2023). Rate restaurants based on sustainability and plastic use. Retrieved from https://www.plasticscore.co
7. Startup India. (2024). Promoting innovations in recycling and biodegradable alternatives. Department for Promotion of Industry and Internal Trade. Retrieved from https://www.startupindia.gov.in
8. UNEP (United Nations Environment Programme). (2023). Turning off the tap: How the world can end plastic pollution and create a circular economy. Nairobi. Retrieved from https://www.unep.org/resources/report/turning-tap
9. UNDP India. (2022). Plastic Waste Management Programme: Circular economy initiatives in India. Retrieved from https://www.undp.org/india/publications/plastic-waste-management-programme
10. University of Georgia & NOAA. (2023). Marine Debris Tracker. Retrieved from https://marinedebris.engr.uga.edu
11. Indian Oil Corporation Ltd. (2023). Plastic waste to fuel conversion technology - R&D initiatives. Retrieved from https://iocl.com
12. World Economic Forum. (2022). Innovative solutions to tackle plastic pollution. Retrieved from https://www.weforum.org/agenda/2022/06/these-innovations-are-tackling-plastic-pollution/
13. Mission LiFE. (2023). Mission Lifestyle for Environment: India's global movement for sustainable living. NITI Aayog. Retrieved from https://www.niti.gov.in/mission-life
14. Swachh Bharat Mission – Urban. (2023). Swachhata App and Smart Cities' plastic waste monitoring tools. Ministry of Housing and Urban Affairs, Government of India. Retrieved from https://swachhbharaturban.gov.in
15. United Nations. (2024). UN Treaty on Plastic Pollution – Negotiation brief. Retrieved from https://www.unep.org/intergovernmental-negotiating-committee-plastic-pollution

Eco-Friendly Alternatives to Plastic (As per Mission LiFE Goals)

Mission LiFE encourages conscious consumption, mindful disposal, and sustainable choices. Below are plastic items commonly used in India, with their eco-friendly counterparts:

	Plastic Item	Eco-Friendly Alternative	Description / Use
	Plastic carry bags	Cloth / jute / canvas bags	Durable, reusable, washable bags ideal for groceries and shopping
	Plastic bottles	Steel / copper / glass bottles	Long-lasting, safe for drinking water; avoid PET bottles
	Disposable cups and plates	Areca leaf, bagasse, bamboo, or ceramic	Compostable tableware for home, events, and street food vendors
	Plastic straws	Paper, bamboo, steel straws	Reusable or compostable; suitable for cafes and juice vendors
	Plastic toothbrush	Bamboo toothbrush	Biodegradable handle with minimal plastic bristles
	Plastic cutlery (spoons, forks, knives)	Wooden / bamboo / steel cutlery	Ideal for office lunches, parties, and takeout services
	Food containers (Tupperware, single-use boxes)	Steel, glass, clay, or compostable boxes	Safer for health and environment, reusable for decades
	Plastic cling wrap	Beeswax wrap or cotton food wraps	Reusable and breathable alternative for storing food
	Sanitary pads	Cloth pads, menstrual cups, biodegradable pads	Sustainable menstrual hygiene options with zero plastic waste
	Plastic pens	Refillable ink pens or fountain pens	Reduces plastic waste from disposable ball pens
	Plastic packaging tape	Paper tape / cloth tape	Compostable and recyclable alternative for parcels and packaging

List of Eco-Friendly Product Websites & Distributors in India

For Pro Planet People promoting Sustainable Lifestyles

Name	Website	Key Product Categories	Notable Features
OneGreen	www.onegreen.in	Plastic-free kitchenware, personal care, home care	India's largest curated eco-store, Green Code™ verified
Brown Living	www.brownliving.in	Compostables, organic clothes, sustainable gifting	100% plastic-free shipping; zero-waste mission
Bare Necessities	www.barenecessities.in	Refillable personal care, menstrual hygiene, lifestyle kits	Women-led zero-waste brand; educational resources
Green Feathers	www.greenfeathers.in	Eco-friendly cleaning products, steel bottles, biodegradable bags	Recycled & natural product lines
Beco India	www.becobamboo.com	Bamboo tissue rolls, kitchen rolls, garbage bags	E-commerce and retail presence (Amazon, Flipkart)
The Better Home	www.thebetterhome.com	Plant-based cleaners, compost kits, steel bottles	Subscription options; supported by The Better India
Rusabl	www.rusabl.com	Bamboo toothbrushes, steel straws, eco essentials	Minimalistic designs; focused on plastic-free essentials
Green Sense	www.greensense.in	Organic groceries, khadi products, cloth bags	Verified by India Organic & Jaivik Bharat
Mitticool	www.mitticool.com	Clay cookware, non-electric fridge, water bottles	Traditional & eco-conscious rural innovation
Ecoyan	www.ecoyan.com	Sustainable office products, gift boxes, cork items	Corporate gifting; artisanal & vegan-friendly products
Upcycleluxe	www.upcycleluxe.com	Ethical fashion, upcycled accessories	Promotes circular economy & slow fashion

Disclaimer: The above list is provided purely for public benefit and environmental awareness under Mission LiFE. CERC–EIACP and its partners do not endorse, promote, or take any responsibility for the accuracy, delivery, quality, or sustainability claims of any products listed herein. Users are advised to verify the authenticity and certifications of the products and sellers before making any purchase.

Events (April - June 2025)

On **8th April 2025**, a session on organic and pesticide-free farming was conducted at Sat Kaival Temple, Moritha, Mandvi, in Surat district. Led by Mr. Hiren Chaudhari, the event drew 189 farmers who were introduced to sustainable agricultural practices aimed at improving soil health and minimizing chemical dependence.

At **Ashram Shala in Umarpada, Surat, on 8th April 2025**, Dr. Neel Talati engaged 280 students in an eye-opening discussion about ecolabelling and food adulteration. He emphasized how informed consumer choices and awareness can empower the younger generation to promote food safety and environmental sustainability.

A third session held on **8th April 2025** at Ashram Shala, Umarda, Surat, saw Mr. Hiren Chaudhari interact with 242 students on the topic of wildlife coexistence. He encouraged the youth to respect biodiversity and adopt harmonious practices in regions near forest areas.

On **8th April 2025**, a knowledge-sharing event took place at Vegi Village, Mandvi, Surat, where 146 villagers participated. Mr. Hiren Chaudhari shed light on the significance of non-timber forest products and promoted traditional, eco-friendly harvesting methods for long-term livelihood and ecological balance.

On **9th April 2025**, Dr. Neel Talati conducted an informative session at Ashram Shala Dabhvan, Umarpada, Surat, reaching out to 312 students. He introduced them to the core principles of Mission LiFE and presented a short film titled Prakruti, reinforcing the importance of nature-friendly living.

In another impactful lecture held on **9th April 2025** at Ashram Shala Kevdi, Surat, Dr. Talati delivered a Reptile Education Program attended by 421 participants. The session highlighted the role of reptiles in ecosystems and the urgent need to conserve these often-misunderstood species.

On **9th April 2025**, Mr. Hiren Chaudhari addressed the same audience at Ashram Shala Kevdi on eco-friendly alternatives in daily life. He urged participants to shift towards biodegradable and sustainable products as part of a broader environmental ethic.

On **9th April 2025**, Mr. Chaudhari also conducted a Mission LiFE awareness program at Parvat Village, Mandvi, Surat, with 280 villagers attending. He emphasized practical lifestyle changes to reduce environmental impact and encouraged a collective commitment to sustainability.

Marking **10th April 2025**, Dr. Neel Talati visited Ashram Shala Zankhvav, Taluka Mangrol, Surat, to celebrate the Earth Day 2025 theme "Our Power, Our Planet." In a session attended by 274 students and staff, he emphasized the power of community in addressing climate change and resource conservation.

On **1st May 2025**, a specialized lecture was organized at the CERC office for a group of 10 law interns. Dr. Talati explained forest conservation techniques and legal frameworks, linking them with Mission LiFE's goals to foster environmentally responsible legal practices.


On **9th May 2025**, CERC EIACP and Xavier's Research Foundation (XRF) held a series of awareness sessions at ITI Ankleshwar. Dr. Purvi Bangoria led a lively session with 158 students on sustainable lifestyles and conducted an interactive environmental game called Pictorial to reinforce learning.


Another session on **9th May 2025** at ITI Ankleshwar was delivered by Dr. Disha Patel, focusing on solid waste management. She educated the same group of 158 students on the 4R Reduce, Reuse, Recycle, and Recover—and the consequences of poor waste handling practices.


On the same day, **9th May 2025**, Dr. S.R. Dave also addressed the students at ITI Ankleshwar. His session underlined the essential value of nature in human life and the importance of nurturing environmental responsibility through everyday actions.


In celebration of World Environment Day, a painting competition was organized by CERC and GEMI on **1st June 2025** at Moritha Prathmik Shala, Mandvi. A total of 55 students showcased creative artwork around the theme "Ending Plastic Pollution," with Riya Sanjaybhai, Jiya Yogeshbhai, and Jenvikumari Harishbhai emerging as top winners.

On **1st June 2025**, Dr. Neel Talati conducted an awareness lecture at Moritha Prathmik Shala, focusing on the negative impacts of plastic pollution. He inspired the students to adopt sustainable habits and contribute meaningfully to global environmental efforts.

A tree plantation drive took place on **5th May 2025**, organized by CERC EIACP in collaboration with Gayatri Parivar, Anand. A total of 76 participants planted 70 saplings of native tree species and took the Mission LiFE pledge to promote sustainable living and help combat plastic pollution.

Environmental Information, Awareness, Capacity Building and Livelihood Programme acronymed as EIACP erstwhile Environmental Information System (ENVIS) was implemented by the Ministry of Environment, Forest & Climate Change by end of 6th Five Year Plan as a Plan Scheme for environmental information collection, collation, storage, retrieval and dissemination to policy planners, decision makers, scientists and environmentalists, researchers, academicians and other stakeholders. MoEF&CC has identified Consumer Education and Research Centre (CERC), Ahmedabad, as one of the Resource Partner to collect and disseminate information on "Environment Literacy - Eco-labelling and Eco-friendly Products". The main objective of EIACP Programme centre- Resource Partner is to disseminate information on Environment literacy, Eco-products, International and National Eco-labelling programmes.

Periodical Printed & Published By

Programme Coordinator, CERC-EIACP Programme Centre, Resource Partner On Behalf of Consumer Education & Research Centre, 801, 8th Floor Sakar II Building, B/H Ellisbridge Shopping Centre, Ashram Road, Ahmedabad- 380 006, Gujarat, India.

Phone: 079-27489945/46

cerc@cercindia.org

http://www.cercenvis.nic.in/

@CERC.EIACP
@cerc_eiacp
@cerc_eiacp
@CERC-EIACP
@cerc-eiacp

Write to us: We value your views and suggestions. Please send your feedback on this issue. We would also like to invite your contributions on the Eco Product and Eco Labelling.

Printing

Print Express, Ahmedabad.