Advancing Plastic Circularity Practices

Circular Economy Solutions Preventing Marine Litter in Ecosystems (CES)

Commissioned by: Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN)

Co-financed by: European Union

Project partners: Ministry of Environment, Forest and Climate Change (MoEFCC), State of Uttar Pradesh, State of Tamil Nadu, State of Kerala

Project timeline: August 2020 - September 2026

Budget: EUR 7.8 million

Locations: Uttar Pradesh, Tamil Nadu and Kerala

SDGs addressed:

At the edge of Prayagraj in Uttar Pradesh, the Naini Baswar landfill once grew unchecked, an ever-expanding mound of legacy waste, which threatens public health and the environment. For years, it stood as a place where decades of unmanaged plastic, metal, and other non-biodegradable waste piled up, slowly decomposing and polluting the air, water, and land.

Change began in 2022.

That turning point came with a new approach introduced under the Indo-German cooperation project ‘Circular Economy Solutions Preventing Marine Litter in Ecosystems (CES)’. Unlike conventional methods that focused mainly on excavation and basic segregation, this initiative looked deeper into the potential locked within the waste itself. The idea was to extract refuse-derived fuel (RDF) from the legacy waste, especially materials like plastics and other high-calorific-value non-recyclables that are often hard to manage. Initially, the RDF did not meet the assessment criteria set by industry standards. However, through targeted technical interventions, its calorific value was significantly enhanced. This improvement led to greater acceptance and broader use within the industrial sector.

RDF is now being recovered from the landfill and used as an alternative fuel source in cement factories, helping reduce reliance on coal. In just under two years, 55,000 metric tonnes of legacy waste have been diverted from Naini Baswar and transformed into a valuable energy resource.

“Legacy waste refers to accumulated waste that has remained in landfills or dumpsites for decades,” says Mr. Chandra Mohan Garg, Municipal Commissioner, Prayagraj. “It consists of plastics, metals, and other non-biodegradables that become compacted and partially decomposed over time, making separation and processing extremely challenging. If left unaddressed, legacy waste contributes to land, air, and water pollution by emitting greenhouse gases and leaching plastics into the environment.

“A key focus of the project has been on plastics, especially those that would otherwise leak into rivers and eventually the ocean. By turning these materials into RDF, the project keeps them out of the environment and helps reduce marine litter. It cuts pollution, supports cleaner energy for cement industries, and promotes principles of both environmental sustainability and circular economy.

“With GIZ’s technical expertise, we incorporated advanced processes like trommel and ballistic separation to extract RDF from legacy waste at Naini Baswar,” Mr. Garg explains “This RDF was then sold to cement factories as a coal substitute, significantly reducing their carbon footprint.” In less than two years, this approach has prevented nearly 90 tonnes of carbon dioxide emissions.

The groundwork for this success was laid through a tripartite agreement facilitated by GIZ, bringing together the Prayagraj Municipal Corporation, cement companies, and brand owners. The collaboration has become a model for broader industrial participation, showing how coordinated efforts can drive systemic change.

Meanwhile in Kerala, the project has taken a different route, one rooted in community engagement and coastal resilience. Here, plastic waste is a pressing challenge, especially with its extensive coastline. In response to it, the project undertook a comprehensive analysis of the local context along with the mapping of the relevant stakeholders who were provided training on waste segregation, collection and its processing.

The initiative placed special emphasis on women-led self-help groups (SHGs) under the Kudumbashree movement. These groups, known as the 'Haritha Karma Sena (HKS) – Green Warriors', are now key players in the household waste segregation efforts. In partnership with the Trivandrum Municipal Corporation, the initiative has supported these women with training in digital literacy, social skills, and sustainable waste management practices. Their roles have been formalised within the local waste management ecosystem.

The project is helping change societal perceptions by showcasing the vital role women play in creating cleaner, healthier communities. By enabling SHGs to make eco-friendly products and connecting them to local businesses, the initiative is also opening up new markets and paths to financial independence and enhancing their leadership capacities.

Further promoting sustainability, the project has introduced the 'Refill Truck', a mobile store encouraging people to bring their own containers and purchase household products with minimal packaging. It's a small but powerful step toward reducing single use plastic and embracing a reuse-refill economy.

At the national level, the Ministry of Environment, Forest, and Climate Change (MoEFCC) is reinforcing these efforts. Through Extended Producer Responsibility (EPR) targets, brand owners are being encouraged to adopt reusable packaging and refillable systems. This lays the foundation for a reuse-refill economy in India.

Building on this momentum, the project, across six cities in Uttar Pradesh, Tamil Nadu, and Kerala, is showing how technology, policy, and community action can reshape how we manage waste. By closing material loops and fostering partnerships across sectors, the project is helping pave a way to create a cleaner, more sustainable tomorrow.