

INNOVATION ON THE ISLAND

SRI LANKAN SOLUTIONS FOR A PLASTIC-FREE FUTURE



An island country leading the way in innovative solutions to the worldwide plastic crisis.

By –



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In Sri Lanka's deep blue surrounding waters, where centuries of maritime trade existed, a different kind of revolution is taking place. The teardrop-shaped

island, with a population of 22 million, is developing a reputation as a global leader in the battle against plastic pollution. Sri Lankan innovators, entrepreneurs, and community collaborators are discovering innovative solutions that could provide a model for the world

The Plastic Problem in Paradise

Sri Lanka's relationship with plastic pollution is very complex and current. Annually, Sri Lanka produces about 2.50 million tons of solid waste, with plastic representing almost 8%¹. Sri Lanka is an island nation with a coastline of over 1,600 km, subjected to constant threats from both land-based and ocean-based debris.

COVID-19 presented concrete evidence of the plastic threat through increased use of single-use items, broken waste management systems, and larger quantities of discarded plastic. Nonetheless, this challenge prompted innovation and new thinking among young Sri Lankans, synthesizing their ancestors' knowledge with futuristic technological knowledge.

From Coconut Husks to Bioplastics

One of Sri Lanka's significant innovations is an abundant by-product of agricultural processes, coconut husks. Dr. Ajith de Alwis, a professor at the University of Moratuwa, has been researching converting the coir fibers of coconut into biodegradable packaging materials². His team engineered a process to convert coconut waste into



durable, water-resistant bioplastics that decompose entirely within six months.

"We were sitting on a goldmine," Dr. de Alwis stated. "Sri Lanka has 2.5 billion coconuts produced every year, and traditionally, the only thing we used to do with the husk material was throw it away or burn it, and we have then turned this waste material into the solution for another waste problem."

Coconut bioplastics have received attention internationally, with pilot projects currently running in food packaging and agricultural uses. Local startup Eco-Coir Solutions has started commercially producing biodegradable bags for different major Sri Lankan retailers.

Seaweed Packaging Revolution

At Sri Lanka's northwestern coast, marine biologist Dr. Chamari Hettiarachchi is now breaking new ground with seaweed-based packaging. Dr. Hettiarachchi and her research team partnered with local fishing communities in Negombo and Chilaw and have found a way to extract natural polymers from underutilized seaweed species to create transparent, edible packaging³.

The process not only offers a solution to plastic packaging but also creates supplementary jobs for the coastal communities in which those seaweeds are harvested. With an additional understanding of the transitions that establish a circular economy, previously discarding seaweeds is one of many examples of rural livelihoods transitioning for environmental positives as well.

Initial trials have also found that seaweed-based packaging can extend the shelf-life of fresh produce with no issues digesting it and providing nutrition! Several food processors in Sri Lanka are now also trialing these materials with fruit and vegetable packaging.

Plastic-to-Fuel Innovation

Ravi Jayawardena is an engineer who runs Lanka Clean Energy, a company based in Katunayake, an industrial hub. Jayawardena has implemented a pyrolysis system that transforms plastic waste into fuel. In pilot plants, they will soon be able to produce up to 500 kilograms of plastic waste per day, converting it into diesel and other petroleum products⁴.

The application of this technology has been highly valuable in the conversion of mixed plastic waste, which is difficult to recycle through other methods. The quality of the fuel produced has met international standards and is currently being evaluated for local distribution with some transportation companies.

Community-Driven Solutions

The most remarkable part of Sri Lanka's plastic-free movement is that it is entirely grassroots. Community leader Nilanthi Perera has helped residents in Colombo's Slave Island neighborhood coordinate a set of "plastic-free zones" where people are working together to eliminate single-use plastics from their lives⁵.



Their effort incorporates old ways and new choices. Residents wrap food with banana leaves and lotus leaves, use clay pots for storage, and shop with cloth bags made locally. The community has also developed a repair and reuse center where they have items repaired instead of thrown away.

Government Support and Policy Innovation

The government of Sri Lanka has played a vital role in progressive legislation and incentive programs. In 2021, the government issued a ban on single-use plastic items, with subsidies given to domestic makers of biodegradable alternatives as well as appropriate tax incentives for the processing plants of plastic waste. The Ministry of Environment has launched the "Green Island Initiative," which provided grants and technical support for startups developing sustainable alternatives to plastic products. In the first 2 years of the program, they supported over 50 creative projects.

Challenges and Scaling Solutions

Nevertheless, there are also significant difficulties to address. The price of biodegradable alternatives is still generally higher than that of conventional plastics, inhibiting more mainstream uptake. In many rural areas, the infrastructure to collect and process plastic waste continues to be very poor. Moreover, change in consumer behavior requires ongoing education and awareness campaigns.

Dr. Malik Fernando, director of the Centre for Environmental Justice, stresses the importance of systemic change: "The individual innovations are encouraging, but we need to act together across government, business and our communities to make changes on scale."⁷

International Recognition and Replication

Sri Lanka's plastic-free innovations are receiving international praise. Several Sri Lankan projects have been highlighted in the global best practices database of the United Nations Environment Programme⁸. Many South Asian and African countries are looking at these innovations for adaptation to their context.

The coconut-based bioplastic technology is being piloted in Thailand and the Philippines, while the seaweed packaging is being considered from coastal communities in Indonesia and Bangladesh. The transfer of this knowledge illustrates that innovations that are developed in Sri Lanka can impact globally.

The Path Forward

The fight against plastic pollution advances through innovative methods in Sri Lanka while emerging trends become apparent. Artificial intelligence, together with machine learning technology, is making waste sorting and processing procedures more efficient. Blockchain technology undergoes testing to establish transparent supply chains for recycled materials. Startups working with universities and international organizations are



speeding up the creation and implementation of innovative solutions.

The path to a plastic-free future for the island remains unfinished yet rests on solid groundwork. Sri Lanka demonstrates that small nations can drive major transformations through its integration of innovation with tradition and technology with community efforts along with blending local solutions and global perspectives.

Conclusion

The world can learn a lot from Sri Lanka's approach to tackling plastic pollution. The event that led to the breakthrough had no single event to lead to success. It was about variety, creativity, and commitment, ranging from laboratory innovations to grassroots efforts, from government policy to communities in action. Sri Lanka is showing the world that a shift from a plastic future to a plastic-free future is not only possible but profitable and sustainable.

At a time when the world is struggling with the plastic crisis, many of Sri Lanka's inventions and initiatives show potential, hope, and pragmatic ways to work through a long-term crisis. The positive environmental message emanating from this island is singular and simple. When we apply our creativity, commitment, and collaboration, we can overcome the most significant environmental challenge of our time and find new opportunities for positive change. The innovations coming out of this small island might just provide some of the answers to one of the

world's greatest conundrums. In the quest for a plastic-free future, Sri Lanka is embodying the idea that scale/size does not determine impact vision and determination counts.

References

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