

Exploring Sustainable Alternatives to Plastic

A Step towards a Greener Future!

THE world population is continuously growing; as per the UN statistics, it is predicted to rise to around 2 billion individuals in the next 30 years. The population is likely to rise from the present 8 billion approximately to over 9.5 billion in 2050. It could reach 10.4 billion approximately in the mid-2080s. This population increase with time demands more food and other essentials for maintaining sustenance, including comfort in living. In today's world, as the income of the middle-class population is expanding, this has brought a change in their lifestyles as well. In the past, the same population used to think of saving more than spending. But, gradually with time, people evolved, and with an increase in income, spending more came into being. People are moving towards living a luxury lifestyle; hence, instead of consuming home-based things alone, they have started relying on ready-to-consume things from outside. One of the most appropriate examples includes relying on ready-to-eat food. This requires an efficient packaging for safe consumption from the manufacturers' as well as the customers' point of view.

Plastic has been the most commonly used material for packaging since the beginning. Today, due to its excessive use and without evaluating the consequences, plastic pollution has reached at alarming levels, with staggering amounts of plastic waste polluting our oceans, rivers, and landfills. Single-use plastics, in particular, contribute significantly to this crisis, taking hundreds of years to decompose and releasing in ecosystem harmful toxins during the process. From packaging to household items, plastic has infiltrated nearly every aspect of modern life, exacerbating environmental degradation and endangering countless species.

Indian laboratories are researching to reduce, recycle and reuse plastic products. A number of alternatives to plastic products have also been developed by our scientists. Herewith, we provide a brief outline of R&D innovations made by a few laboratories of the Council of Scientific and Industrial Research (CSIR).

CSIR-NIIST's Initiative to Combat Plastic Threat

It is good to know that some of the constituent laboratories of CSIR are constantly working to combat this deadly plastic pollution problem through their various research initiatives. Their research works to explore various sustainable alternatives to plastic are unique in their own ways. CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), based in Thiruvananthapuram, Kerala, has developed

remarkable eco-friendly products from biodegradable coir-based pellets made out of coconut husk. These products, in the form of garden pots, decomposable core plugs for the textile industry, and biodegradable drain cells, serve as an ultimate solution to conventional plastics. The institute has also made biodegradable cutlery out of agricultural waste as an alternative to single-use plastics.

Innovations of CSIR-CFTRI to Fight Plastic

CSIR-Central Food Technological Research Institute (CSIR-CFTRI), based in Mysore, Karnataka, hosted a two-day seminar on 3 and 4 August 2023, on the topic, "Replacing single-use plastic by paper with emphasis on food packaging". The seminar was organised by the Indian Pulp and Paper Technical Association (IPPTA). The two entities have joined hands to work in collaboration for the development of paper alternatives to single-use plastics. CSIR-CFTRI's Food Packaging Technology Department has been working on various food processing techniques that include active, intelligent, and biodegradable packaging. It also works on the food packaging materials' safety evaluation and the foods' shelf-life analysis.

The department faculty undertakes projects related to food packaging from food industries, and also conducts R&D projects in food packaging. To develop paper packaging as an alternative, the scientists at CFTRI will extensively discuss the statutory requirements, product specifications,



Biodegradable cutlery made from agricultural waste by CSIR-NIIST