

# Is Plastic Packaging a Real Threat the Environment? What is the Better Alternative to Safer Food Packaging?

Chaitradeepa G Mestri<sup>1</sup> and Preeti Birwal<sup>2\*</sup>

<sup>1</sup>Ph.D. Scholar, Department of Food Technology, M S Ramaiah University of Applied Sciences, Bangalore, Karnataka, India

<sup>2</sup>Scientist, Punjab Agricultural University, Ferozpur Road, Ludhiana, Punjab, India

\*Corresponding Author: [preetibirwal@gmail.com](mailto:preetibirwal@gmail.com)

No, not if you dispose the plastics by considering the environmental hazards that can arise if they are not handled properly. Many of us have forgotten, whether intentionally or unknowingly, that plastic has become an integral part of day to day's activity. We have only been educated about its negative impacts on the environment, yet on the other hand it offers benefits too. If there were no plastic on the planet, we would have to rely on wood-based packaging material at their peak. And this would lead to a rise in and exploitation of other packaging material, resulting in global warming. Plastic as a packaging material is light weight, robust and compatible with wide range of commodities, making it suitable for multiple applications (Tyagi *et al.*, 2021). One might be surprised to hear that; plastic materials have a beneficial impact on resource usage and emission reduction. When compared to alternative packaging materials, the commodity, which may be fruits, vegetables, electrical, pharmaceutical etc., when packed provides hygienic products and a purpose to buy the same (Barage *et al.*, 2022).

Though plastic has various uses, we have been addicted to its one-time use and followed by its disposal which leads to serious environmental issues (Opeolu Olukunle, 2019). Every minute over one million drinking water bottles have been purchased and disposed, in general about half of the all-produced plastic materials are designed and used only once and thrown away. Importance of plastic and its utilization started from 1950's. During 1950's

to 70's, only small amount of plastic has been manufactured and relatively less waste. By 1990's, plastic manufacturing was tripled and in the early 2000's the plastic waste has grown tremendously (Lebreton *et al.*, 2019). Currently we are producing around 300 million tons of plastic waste, which is nearly equivalent to the weight of the human population on the earth (McGinty, 2020).

According to researchers, it is estimated that around 60 % of the plastic has been ended either in natural environment or in landfills. There is a need to minimize the use of plastic and manage the waste in a right way (Law & Narayan, 2022). We must know that rivers carry the plastic waste from the land and adds to oceans, if the present trend continues, there will be a greater number of plastics in the ocean rather than fish by 2050 (Ciner *et al.*, 2023).

The concept of non-biodegradability plastic has become a source of research in current era; we cannot eliminate plastic from the planet since it has resulted in numerous inventions in its own field (Koh & Khor, 2022). To reduce waste and make it more efficient, one must adopt the reuse, reduce, and recycle concept, which we have been hearing since ages (Long *et al.*, 2022). So, where are we going wrong?

Humans are becoming irresponsible, as we throw plastics and other thrash as land fill, which eventually ends up in the sea or river, causing pollution. There is a need to inculcate basic principles about the usage and handling of plastic. After using any plastic material, whether it is plates,

water bottle or a bag, wash it with clean water and crush the bottle or plates before disposing into separate garbage and handing it over to a plastic recycling agency (Weber Macena *et al.*, 2021).

Along with the basic principles of reduce, reuse, and recycle, lets us also educate and create awareness among the public about handling and disposal. Let us recognize that plastic is not a burden but a manageable gift, and that it is in our hands to maintain the balance in the environment. If we can behave responsibly, we have the potential to make a significant impact on the economy.

Consumers and governments are becoming more aware nowadays that recycling plastic will not cut it when it comes to sustainability. Brands have been thinking about compostable packaging because the materials used mostly decompose in the environment, leaving a footprint that is significantly smaller than that of conventional plastic and even enriching the earth by creating an agricultural compost end-product that improves crop yields, helps soil retain water, and captures more carbon.

The better alternative to plastic food packaging material is eco-friendly packaging material. In recent years, edible coatings and films have drawn a lot of interest. Polysaccharide, lipid, and protein-based materials utilized in edible packaging, as well as their composites, clearly have advantages over synthetic films. It might assist in lowering environmental pollutants.

### Consumer Demand

Consumer preferences are changing with regards to the purchase of food products, and people are becoming more conscious of the existence, function, and consequences of the food packaging that surrounds their retail food purchases (Chirilli *et al.*, 2022). Additionally, consumers are choosing the

biodegradable wooden spoons and paper straws that come with food packing. Paper or biodegradable materials are replacing single-use plastic straws, closures, lids, caps, and food trays in the food service industry. Due to rising consumer desire for prepared and packaged meals, there will be an increase in the market for green food packaging (Asawadechsakdi & Chavalkul, 2021).

### Why choose Biodegradable packaging?

The fact that biodegradable packaging is environmentally friendly is its main advantage.

#### Free of Toxic Materials

Biodegradable packaging is a perfect substitute for plastics that would otherwise release dangerous chemicals into the atmosphere and remain in landfills for years because it is free of poisonous substances and compounds like phthalates or petroleum (Wojnowska-Baryła *et al.*, 2022).

#### Convenient Disposal

Regardless of the type, companies should use recyclable or biodegradable packaging and delivery supplies. Given that biodegradable materials are used in eco-friendly packaging, it facilitates the disposal of shipping supplies. It takes fewer resources to disassemble the package once its purpose has been served. Customers who decide to compost their garbage can easily mix recyclable materials with biodegradable shipping and packaging materials. This procedure may also be advantageous to the environment (AZMI *et al.*, 2022).

#### Versatility

Flexible packaging is a fundamental benefit of biodegradable transportation goods. The majority of big industries often have the ability to reuse packaging and transportation materials. Whether the company needs packaging for electrical devices or

office supplies storage, there is unquestionably an eco-friendly material that can suit its needs (Escursell *et al.*, 2021).

### Sustainability

Most of the used resources fall under one of the three sustainability criteria of reduce, reuse, and recycle (Yu *et al.*, 2021). Reduce focuses on using more durable yet lightweight materials that might be able to complete the same task as more powerful ones with less effort.

Reuse focuses efforts on creating items that can be used again after serving their primary purpose. Recycling each item is encouraged by creating more reliable and secure transportation materials for consumers and businesses. Naturally, recycling is focused on producing products that are mostly made of recycled materials. The bundled good can then be recycled by the business or the client.

### Conclusion

Instead of concentrating on only one aspect of sustainability, packaging converters must adopt a comprehensive strategy. The survey's findings demonstrate that consumers want to see change in a variety of environmental fields. It will be vital to adopt environmentally friendly food packaging materials when packaging players respond to them so that customers can see and comprehend the sustainability story.

### References

- Asawadehsakdi, W., & Chavalkul, Y. (2021). The Creation of Single-Use Packaging from Leaves to Reduce the Plastic Waste. *Journal of Urban Culture Research*, 23, 273-286.
- Azmi, N. I. B., Ramli, A. S. B., & Rosli, N. R. A. B. (2022). Eco-Friendly Food Carrier.

- Barage, S., Lakkakula, J., Sharma, A., Roy, A., Alghamdi, S., Almeahmadi, M., ... & Abdulaziz, O. (2022). Nanomaterial in Food Packaging: A Comprehensive Review. *Journal of Nanomaterials*, 2022, 1-12.
- Chirilli, C., Molino, M., & Torri, L. (2022). Consumers' Awareness, Behavior and Expectations for Food Packaging Environmental Sustainability: Influence of Socio-Demographic Characteristics. *Foods*, 11(16), 2388.
- Ciner, M. N., Özbaş, E. E., Özcan, H. K., Öngen, A., Güneysu, S., & Aydın, S. (2023, April). Plastic Waste and Plastic Footprint. In *International Conference on Engineering, Natural and Social Sciences* (Vol. 1, pp. 510-515).
- Escursell, S., Llorach-Massana, P., & Roncero, M. B. (2021). Sustainability in e-commerce packaging: A review. *Journal of cleaner production*, 280, 124314.
- Koh, L. M., & Khor, S. M. (2022). Current state and future prospects of sensors for evaluating polymer biodegradability and sensors made from biodegradable polymers: A review. *Analytica Chimica Acta*, 339989.
- Law, K. L., & Narayan, R. (2022). Reducing environmental plastic pollution by designing polymer materials for managed end-of-life. *Nature Reviews Materials*, 7(2), 104-116.
- Lebreton, L., Egger, M., & Slat, B. (2019). A global mass budget for positively buoyant macroplastic debris in the ocean. *Scientific reports*, 9(1), 12922.
- Long, Y., Ceschin, F., Harrison, D., & Terzioğlu, N. (2022). Exploring and Addressing the User Acceptance Issues Embedded in the Adoption

- |   |  |
|---|--|
| <p>of Reusable Packaging Systems. <i>Sustainability</i>, 14(10), 6146.</p> <p>McGinty, D. (2020). How to build a circular economy.</p> <p>Opeolu Olukunle, T. (2019). Plastic Waste Awareness and Practices among Young Environmentalists in the Faculty of Environmental Sciences, University of Lagos.</p> <p>Tyagi, P., Salem, K. S., Hubbe, M. A., &amp; Pal, L. (2021). Advances in barrier coatings and film technologies for achieving sustainable packaging of food products—a review. <i>Trends in Food Science &amp; Technology</i>, 115, 461-485.</p> <p>Weber Macena, M., Carvalho, R., Cruz-Lopes, L. P., &amp; Guiné, R. P. (2021). Plastic food packaging: perceptions and attitudes of Portuguese</p> | <p>consumers about environmental impact and recycling. <i>Sustainability</i>, 13(17), 9953.</p> <p>Wojnowska-Baryła, I., Bernat, K., &amp; Zaborowska, M. (2022). Plastic Waste Degradation in Landfill Conditions: The Problem with Microplastics, and Their Direct and Indirect Environmental Effects. <i>International Journal of Environmental Research and Public Health</i>, 19(20), 13223.</p> <p>Yu, K. H., Zhang, Y., Li, D., Montenegro-Marin, C. E., &amp; Kumar, P. M. (2021). Environmental planning based on reduce, reuse, recycle and recover using artificial intelligence. <i>Environmental Impact Assessment Review</i>, 86, 106492.</p> <p>.</p> |
|---|--|

\* \* \* \* \*