Chapter 10
Towards Waste Minimization in Food Packaging:
Exploring Sustainable Methods for Packaging and Disposal

Rohit Saroha
SGT University, India

Gaurav Bathla
CT University, India

Harish Kumar
SGT University, India

Garima Sharma
Bhagat Phool Singh Governmentt Medical College, India

ABSTRACT

Approximately half of all garbage generated globally is attributed to packaging waste, making it a substantial contribution to global waste levels. The growing environmental issues related to food packaging waste require immediate investigation of possible remedies One of the biggest challenges is dealing with disposable things, like straws, cups, lids, cutlery, takeaway containers, and bags. They damage ecosystems in addition to adding to packing trash. This research endeavors to address this imperative by investigating innovative methods for both packaging and disposal, with the overarching aim of waste minimization of food packing. Through a comprehensive review of literature, this study synthesizes existing knowledge on sustainable packaging materials, including biodegradable polymers, compostable materials, and recyclable alternatives. By considering the entire lifecycle of food packaging, from production to end-of-life disposal, this study aims to provide holistic insights into sustainable practices that minimize environmental footprint and resource depletion.

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INTRODUCTION

Food quality must be maintained while also meeting the increasing needs of producers, customers, and governmental bodies, all of which require customized packaging materials. According to estimates, the rise in global population growth will necessitate a 50% increase in food supplies globally by 2050 (Hubert & Rosegrant, et, al., 2010). The future of food: scenarios for 2050. Food packaging materials are in high demand together with food. Food packaging is discarded along with the product itself, adding to the environmental load.

1.1 Food packing

Food waste has become a global catastrophe due to the interconnected issues of climate change, deforestation, groundwater contamination, biodiversity loss, and land, water, and water scarcity (Mishra, 2023). Food waste is a sustainability issue with both short-term financial repercussions and long-term social and ecological ones. It might be said that everyone who works in the food service sector, from chefs and managers in charge of food and beverage to waiters and waitresses, confront difficulties on a daily basis as they attempt to save expenses while also avoiding food waste. Container that is recyclable. The majority of contemporary packaging materials are primarily made of oil (Davis & Song, 2006). Packaging accounted for 40% of the total plastic manufactured in 2018, making it the largest end-use market with 360 million metric tons produced. Between 2018 and 2019, Europe produced 62 million tons of plastic, a 9.5% increase. Due to its role in climate change, the continued presence of plastics in the environment is extremely dangerous for the ecology and human health (Ford et al., 2022).

30% of plastic packaging materials may never be able to be recycled or reused unless the materials are totally rebuilt, despite the fact that recycling is regarded to be the primary strategy to minimize the problems with plastic use in the environment and waste management. This is due to the fact that various types of plastic, such blended plastics or materials with many layers, each containing a different type of plastic, present recycling issues (Hopewell & Dvorak, et, al., 2009). Any case would require the employment of alternate strategies to address the waste management issues associated with the disposal of plastic waste because the cost and technological constraints of sorting and recycling the various plastic polymers might be too high (Barlow & Morgan, 2013; Ellen MacArthur Foundation, 2017). Improved recycling technology can only partially alleviate the problem due to food contamination and the food sector's increasing use of multi-layered packaging materials. This is because, compared to single-layered materials, multi-layered materials provide a considerably superior barrier to gas and water transmission, which helps avoid food deterioration (Barlow and Morgan, 2013). High-barrier, multi-layer, biodegradable food packaging may be a suitable substitute for the existing multi-layered, non-recyclable, non-biodegradable packaging from the standpoint of waste management.

1.1.1 Types of Food packaging

So far, there has been very little discussion in the scientific literature regarding the relative value that consumers place on various forms of packaging. Klaiman et al. (2016) investigated the recyclability and consumer willingness to pay of several packaging materials. Of the four options they considered—plastic, aluminium, glass, and carton—their research showed that plastic was the most popular and least environmentally friendly. However, despite consumers' growing awareness of plastic's detrimental

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