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# Need for a Better Packaging Material

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## ABSTRACT

Packaging industry alongside studying the probability of a substitute for the conventional packaging material is of utmost importance. In 2018, approximately 531 Million Tonnes of plastics ended up in oceans. Plastic ruled the global packaging industry for last 5 to 6 decades. During these times, world witnessed the ill effects of non-biodegradable waste of plastic packaging on the global environment. After all this plastic remains the first choice for the Industry. A large portion of this plastic ends up as waste and if not recycled properly leads to environmental problems. This article will study the recent trends in advancements and possible green alternatives for conventional packaging material.

## INTRODUCTION

In the climate change scenario, pollution occurring in any manner is key issue. According to the Environmental Protection Administration (EPA), the amount of recycled plastic containers and packaging in 2015 was 2.2 million tonnes, or just 14.6% of all plastic packaging generated that year. Where does all of that plastic go? Most of it ends up in landfills, but an alarming and dangerous amount ends up in our oceans (Anon., 2021a). This is a huge problem as this will gradually lead to recurrent incidents like landslides and fires near the landfills. Animals may also get tangled and drown in plastic bags. Animals often confuse the bags for food and consume them, therefore blocking their digestive processes. Animals becoming entanglement in marine debris, including plastic bags, may cause starvation, choking, laceration, infection, reduced reproductive success, and mortality (Katsanevakis, 2008). There were instances where large endangered tortoises were found to have suffocated because of the mistaken swallowing of plastic bags combined with seaweed (Thiel *et al*, 2003).

Plastic packaging is becoming increasingly easier in the current scenario hence there is utmost need to develop the alternative technologies to cope up with climate change issues. Many companies are working on fully compostable (in some cases edible!) packaging which means the hope for a better future persists (Anon., 2021b).

### Conventional Packaging

'Plastics' is a generic term that includes a wide range of materials which may also contain substances to improve their characteristics – plasticizers /additives. The versatility of plastics allows them to be used in a continuously increasing range of applications. The latest estimates point to 359 million tonnes produced worldwide, of which 40% were meant for packaging, i.e. for immediate discard. Most plastics end up in the environment, in the form of larger or smaller

particles (micro plastics) which have been found across the globe. The highly pervasive plastic particles can cause entanglement, may be ingested and inhaled. They may also constitute added routes of contamination for other chemicals, including organic pollutants. Exposure to micro plastics may have numerous physical and chemical effects on biota and, ultimately, human health (Pinto Da Costa *et al*., 2020).

**The Market Size**

Packaging Materials Market was valued at USD 922.95 Billion in 2018 and is projected to reach USD 1134.65 Billion by 2026, growing at a CAGR of 2.63 % from 2019 to 2026.


**Fig. 1.** Global Packaging Materials Market. (Adapted from Pulidindi and Prakash. 2018)

**Major Use of Plastic**

The major consumers of plastic packaging materials are:

- Food processing – 48%
- Pharmaceutical – 27%
- Personal care industries – 19%
- E-commerce and others – 6%

This data has been observed to change as the E-commerce Industry has seen a boom in past 5 years and their share has rose up by almost 5% in terms of consumption of plastic packaging material (Fig. 2).

**Suitability of Packaging Material**

A well-designed good packaging generally has the following features by Naidu (2021)

- Lightweight
- Secure

- Adaptable
- Dependable
- Maintains Status
- Aesthetic

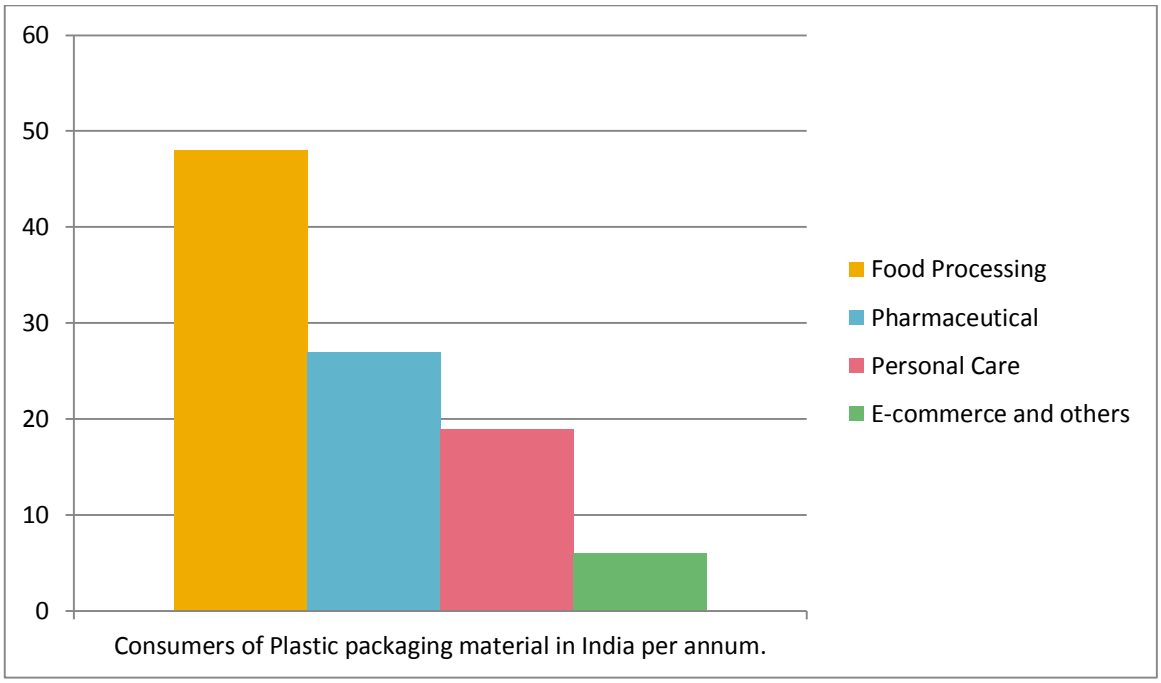


**Fig. 2.** Major consumers for conventional packaging material
(Adapted from Jagdish Kumar, 2015)

**Potential Substitutes**

- Many researchers are currently working on fully compostable packaging. Following are the some examples already available in the market (Anon., 2021d).
- Mushroom packaging. A combination of agricultural waste and mycelium (mushroom) root, this home compostable product is "grown" on a hemp-flour mixture, and then dried to halt the growth process. It is most commonly used to replace Styrofoam packaging.
- Seaweed-based packaging that comes in edible and biodegradable grades.
- Pressed hay is being used as egg cartons in Poland.
- Banana Leaves: In Thailand, where the plastic problem is reaching crisis proportions, one supermarket has opted to go plastic-free in favour of banana leaf-and-bamboo packaging. And while banana leaves may only be practical where they're readily available, this does reinforce the idea of using local, compostable materials.

The list of eco-friendly substitutes is very long and with constant innovation and technological advancements we may eventually reduce the use of plastic in packaging industry.

## CONCLUSION

Plastic is useful in almost every industry yet, it is very harmful to our planet earth. Plastic being cheap and its ease of availability have made it a preferred choice of packaging material, but one must not forget how it harms the ecosystem and biodiversity. Hence, there is a need for a

better packaging material with constant innovation and advancements in technology. The use of bioplastics and eco-friendly natural substitutes is a possible and feasible solution for reduction of usage of plastic.

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