

## Overview: need for sustainable packaging

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### ABSTRACT

Packaging materials are an important aspect of our lives since they are used on a regular basis in grocery shops, supermarkets, restaurants, medicines, and other establishments. Packaging is critical in ensuring that items are preserved during handling, transportation, and storage. Similarly, it aids in

the maintenance and extension of product shelf life. These materials are used in the packaging of meat, poultry, and fish items, as well as food and drinks, cosmetics, and pharmaceuticals. Several applications of packaging materials have been extensively discussed, but little attention has been paid to their end-of-life and continuous availability without negatively impacting the environment.

**Key Words:** *Sustainability; Biodegradable; Biopolymer*

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### INTRODUCTION

Human well-being, the economy, and the environment are the three main categories used to classify sustainability. These three categories can be seen as a way to sustain the ecosystem's resilience while also enhancing human well-being (i.e., equitable burden sharing and social equity). When considering sustainability from an ecological point of view, one must make a contribution to ensure that the environment and a healthy ecosystem are always maintained. Materials used for packaging can also be related to this. If fewer virgin resources are used and post-consumer materials can be recycled or reused from readily available materials, packaging materials are said to be sustainable.

The sustainability of a material depends on a number of variables, from the economic to the environmental, including costs and impacts, the usefulness of aesthetic qualities, production to end-of-life processing, and effects at local to global scales.

Due to their frequent use in grocery stores, supermarkets, restaurants, pharmacies, etc., packaging materials play a significant role in our daily lives. When handling, transporting, and storing products or contents, packaging is crucial in preserving their quality.

Due to the materials used and the labor-intensive procedure involved in making them, packaging materials add to the cost of the product. There has been a lot of research done in this area because of the significant environmental impact that such materials have, both during manufacture and after they have reached the end of their useful lives. Therefore, it is necessary to critically assess the various packaging materials; the application areas for each material as well as the benefits and drawbacks of each packaging material are equally crucial. Plastic, paper, glass, metal, and a variety of other materials are used as packaging materials, but this list is not exhaustive.

A sustainable strategy needs to be looked at to make sure that packaging materials are always available without harming the environment. Among these strategies are material reuse and recycling material selection and the use of bio-based and biodegradable materials. The study thus concentrates on the requirement for sustainable packaging.

### TYPES OF PACKAGING MATERIALS

The quality of the product is significantly influenced by the packaging materials. When packaging material is used to convey information, it must be designed in such a way that it can hold the printed text or graphics.

A key element of product presentation and preservation is the choice of packaging materials. When selecting packaging materials, the type of product is also a deciding factor.

#### Plastics

Petroleum-based polymeric polymers have long been a popular choice for packaging. Polyethylene (PE), polypropylene (PP), polystyrene (PS), and polyester (PET) make up the majority of these polymers. The most common types of packaging are made of plastic, and 26% of all polymers are used in packaging, making it the largest use of plastics.

In the next 20 years, it's anticipated that the amount of plastic used will double as it quickly replaces other packaging materials. This is because of the product's inherent qualities, which include strong barrier properties, lightweight construction, low price, etc. Plastic packing materials have a lot of advantages, but they also have drawbacks because of how bad their effects on the environment are. Carbon dioxide (CO<sub>2</sub>) is released into the atmosphere during the manufacture of products based on petroleum. Additionally, improper collection/recycling of packaging plastics will cause them to end up in landfills and water bodies, pollu-

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