

Standard VI

Action Research Project

Topic for 2020–2021

Ecofriendly / Sustainable Packaging Or Packing

Introduction:

You must have heard about 'PEANUT', the turtle who suffered because it got entangled in the ring of a six-pack holder. It did continue to grow but lost aerodynamic shape of the body and became vulnerable to predator attacks. You might also have heard about how in Iceland 'Say no to toothpaste with a box' movement made manufacturers change the packaging strategy.

How many of us pack *paratha* in aluminium foil or sandwich in a cling film? Even such habits add considerable volume to solid waste over a period of time. Or our general observation is that, we cannot squeeze out the last bit of toothpaste or facewash or sunscreen from the plastic tube and it simply goes waste. The amount of packing materials we receive from online delivery is huge as compared to actual material ordered.

With increasing urbanisation and changing lifestyle, packing and packaging has become an important part of our lives for delivery of goods. But it is proving to be a necessary evil. We need to find out sustainable solution for this.

Packing and Packaging:

Meaning: Packaging is the science, art, and technology of enclosing or protecting products for distribution, storage, sale and use. Packaging also refers to the process of design, evaluation and production of packages. In short, Packaging can be described as a coordinated system of preparing goods for transport, warehousing, logistics, sale and end use.

Packing is selecting and using proper material for placing product for transport and storage to ensure safety but not for a display. A person can also pack clothes and other goods for a holiday or moving to a new house.

Words 'packing and packaging' are confusing because they both start the same way with the root word being pack and they both are used in the same context. The difference between packing and packaging is that the 'packing' provides the protective wrapping of goods to transport but do not display the products. 'Packaging' is used for the protection of goods but also display it for the retail market.

Objectives of packing and packaging:

To Provide Physical Protection: Packaging of objects ensures that they are protected against vibration, temperature, shock, compression, deterioration in quality etc. Packing and packaging also protect the products against theft, leakage, pilferage, breakage, dust, moisture, bright light etc.

To Provide Convenience: Packing and packaging also add to the convenience in handling, display, opening, distribution, transportation, storage, sale, use, reuse and disposal. Packages with easy to carry handles, soft squeezed tubes, metallic containers, conveniently placed nozzles etc. are all examples of this.

To Provide Containment: Small objects are typically put together in one package for reasons

of efficiency and economy. For example, a single bag of 1000 marbles require less physical handling than 1000 single marbles. Liquids, powders, granular materials etc. need containment.

To Provide Portion Control: In the medicinal and pharmaceutical field, the precise amount of contents is needed to control usage. It also helps in the control of inventory.

Objectives of packaging:

To Enable Marketing: Good packaging along with attractive labelling are used by sellers to promote the products to potential buyers. The shape, size, colour, appearance etc. are designed to attract the attention of potential buyers.

To Convey Message: Information relating to the raw materials used, the type of manufacturing process, usage instructions, use by date etc. are all very important and should be conveyed to the users. Manufacturers print such information on the packages.

To Enable Product Identification: Packing and packaging enable a product to have its own identity. This is done by designing a unique and distinct package through the effective use of colours, shapes, graphics etc. Such identification and distinction are very essential in the present situation of intense competition and product clutter. E. g. Calcium Sandoz bottles, Kinderjoy.

To Enhance Profits: Since consumers are willing to pay a higher price for neatly packaged goods, there will be higher profit realization. Moreover, packaged goods reduce the cost of handling, transportation, distribution etc. and also cut down wastage and thereby increase profits.

To Enable Self-Service Sales: The present trend in retailing is effective display and self-service sales. Products require effective packing for self-service sales.

To Enhance Brand Image: Attractive packing and packaging in a consistent manner over a long time enhances the brand image of the product.

Advantages of Packing and Packaging:

The primary packaging advantage is to protect the product in various ways, including:

Keeping products fresh longer: Many food products — from bread to cookies — stay fresher when sealed in packaging.

Preventing breakage and wear-and-tear: Packaging keeps fluids like ink and perfume from evaporating. Paper becomes discoloured and glue unusable when exposed to the air, but keeps for years in its packaging. Items that could be sold without packaging — like stuffed animals and other toys — are shielded from the dings and dirt they encounter during shipping or sitting on store shelves.

Making shipping easier: There are distinct advantages of packaging in logistics. Items that are boxed can be stacked and transported more easily than those that are loose.

Apart from this packaging also helps in arranging display as well as selection of product.

Packing that fulfils the objectives and advantage criteria can be considered good packing or packaging. A good packaging should be attractive at the same time easy to handle and dispose off too. It should be economical in terms of cost, weight and environmental effects. It should display information regarding contents, handling, safety measures, cost, expiry date etc.

Materials used: Different types of materials might be used for packing or packaging.

Wood, metals, plastics, paper, glass, earthenware, gunny bags, straw baskets, polyester etc. are a few examples. Selection of material depends on several factors apart from budget or estimated production cost. It depends on the nature of product (liquid, solid etc.), shelf life, temperature, distance to be covered for delivery, transport facilities, climate etc.

A packing or packaging may be made up of single material like plastic bottle or mixed

material like Tetra packs or notebook cover or cover of paperback version of a book.

Types of Packaging:

Basic classification can be given as Primary, secondary and tertiary packaging.

Primary packaging is the wrapping or container handled by consumer.

Secondary packaging is corrugated boxes or similar containers used to group primary packages and packing material like bubble wrap etc that is used to keep primary packages in place without damage.

Tertiary packaging includes wooden pellets or containers that carry secondary packages together.

Points to be considered while designing a package:

- Design, Appearance, Convenience, Reuse, Cost.

Tests a packaging has to go through before being selected:

Several tests like Drop test, Vibration tests, Rolling test, Inclined impact test etc. are carried out to check

Durability of the material to be used: Packaging is also tested for corrosion by salt spray or penetration of sand and dust or even catching moisture in rains.

Disadvantages of Packing and Packaging:

While packaging does improve safety, offer convenience and reduce theft, it also comes with a number of disadvantages

Cost: The more it costs to package a product, the higher will be the consumer price.

Durability of some materials: Generally, the cheapest materials are also the least durable, like paper and plastic. Flexible packaging such as paper, cardboard and thin plastic — like those that allow “windows” to see the product — can be crushed, dented or torn during shipping or

when handled in the store.

Difficulty of recycling: Some communities don't provide recycling; those that do require households to follow rules such as collapsing boxes, making sure items are clean of food debris and leaving lids on or removing them, etc. When people don't follow these rules, it requires manual handling of materials which is costly and slows down the process.

Mixed material packaging is difficult to recycle, though it is energy efficient. Ex. Tetra packs.

Packaging requires extra room in shipping: While square and rectangular-shaped boxes stack neatly and efficiently, they do take up more room. It also adds to weight of the product. For E. g. a 400 g cereal box like corn flex or oats, ratio of package weight to product is almost 23%!

Reducing packaging affects perceptions: The push to use less packaging — which saves cost and raw materials — also makes consumers think they're getting less product, even when the amounts are the same, but larger packaging was previously used to give the appearance of greater value.

Landfill impact: Packaging is responsible for about one third of the municipal waste. Some waste can be recycled, but many materials are not appropriate for recycling. Post-consumer recycled content is often usable only in specific contexts. For instance, many types of recycled plastic may not be used in food containers, even if the original plastic came from food containers. Much of the waste produced by packaging ends up in a landfill.

Overpackaging: Over-Packaging describes a product that is wrapped in multiple layers of materials, that is either unnecessary or unwanted. An example of this is wrapping a small item in plastic, surrounding it with an air cushion, placing it in a box, and then placing that box into a larger box for distribution. This leads to increase in cost, shipping load and most importantly proves harmful for the environment. With the

boom of E-commerce in the 21st century, the amount of packaging used for the transport of goods has dramatically increased. Most online stores are found to be guilty for supplying more packaging material than necessary for a product. The food industry also contributes negatively to the environment. An example is a dozen apples encased in a plastic clamshell. While there are benefits to this, the negative effects on the environment outweigh the benefits by far.

Production footprint: Packaging also uses resources in production. One pound of polystyrene (Styrofoam) uses about two pounds of petroleum stock. Production also requires energy, usually sourced from burning fossil fuels and may produce air and water pollution. E.g. using glass bottles is eco-friendly as long as glass is reused. For production of glass, silica is required. Sand is a resource. Also, transporting sand to the factory and conversion of sand to glass needs a lot of energy that is derived mostly from fossil fuels.

The direct or indirect impacts of packaging on the environment include soil degradation, water pollution and the sharp reduction of scarce resources such as forests, solid waste pollution and toxic chemical pollution. It seriously affects the sustainable utilisation of resources and environment.

The large amount of waste returned by oceans we see on seashores mainly after stormy weather, actually originates from land-based resources. It mainly comprises of packages thoughtlessly disposed on land. One of the reasons is unavailability of proper disposal stations and ignorance. The victims of this waste are innocent animals like Peanut the turtle or any stray herbivore that consumes plastic.

What is the solution?

Society has learned the hard way that convenient packaging was inconvenient to the planet. The only probable solution is to try to minimise packing and packaging materials and go for sustainable options.

The '3 R' mantra has to be applied here too.

Reduce proves better than Reuse and Reuse better than Recycle.

- We can select product with minimal packing and packaging
- Reuse the material received as packing or packaging. E.g. gone are the days where people used to clean milk bags and reuse those. Or choose an online vendor that has take-away policy for packing material.
- Reuse is better because it reduces the utilisation of resources that might happen in recycling.
- Recycling is better than adding waste in landfills. Some packaging materials can be recycled an infinite number of times, others just 2 or 3 times. Let's break down the lifespan of some of the most commonly used packaging materials:
 - Paper – 5 to 7 times
 - Cardboard – 3 to 4 times
 - Glass – Infinite
 - Plastic – Once
 - Polystyrene – Once
 - Aluminium, copper and other metals – Infinite

Some examples of innovative recycling:

- Nike, a leading sportswear company uses plastic to kit out the U.S. National Soccer Team and every team uniform is made from at least 16 plastic bottles for its shirts, socks and shorts since 2010.
- Use of corrugated sheets for making foldable beds for isolation wards in COVID 19 pandemic is another good example.
- Collection of plastic by Mr. Kaustubh Tamhankar from Thane for production of packaging material used as for stuffing secondary packages.

Ecofriendly / sustainable packaging or packing:

Eco-friendly or Green packaging is biodegradable, recyclable, reusable, non-toxic, made from recycled products, based on biomass or natural products

or manufactured through low-impact means. It is advantageous because it is biodegradable or made from more sustainable, faster-replenishing natural products like bamboo. Bamboo, for instance, can be harvested for paper and other materials every two-to-three years, versus upwards of 60 years for a new tree to grow.

Some examples of eco-friendly packing and packaging:

- Traditional method of packing food in leaves of canna or banana or *Palash* and *Sal* leaves.
- Old Milk bottle system of Aarey, the example of reusable packing and return policy of the manufacturer.
- Compostable sauce sachets made up of seaweeds
- Newspaper egg carton
- Reusable shoe box cum bag by Puma. Reducing resources for packaging
- Plantable packaging made up of biodegradable materials impregnated with organic seeds.
- Edible water bubbles

Designing zero wastage container/dispenser can be another aspect of reducing waste. For E. g. mechanical dispenser for toothpaste that used to be a part of Indian households to squeeze out last bit of toothpaste.

A kitchen tissue dispenser gives away a large piece of towel which may not be necessary every time. Thus, can be improved. These are a few examples.

What students have to do:

Read the information thoroughly

PART 1

- Study the packing and packaging waste created at your home.
- Find out the possibilities of reducing these. This can be done in several ways like, selecting products with least packaging/ changing packing habits/avoiding small packages of snacks/reduce online shopping where unnecessary packaging waste reaches home.

- Mention those in the project.

PART 2

- Observe various packing/ packaging materials and designs of various products around you. It may be at home like bottles/tubes/ sachets/boxes etc. or at malls or at fast food restaurants like pizza/burger stalls. It can be anything from packaging for food material/ toileteries/cleaners/stationery items/clothes/shoes/jewellery etc.
- Select any one and suggest improved design to avoid wastage or improvement or sustainable option for packaging material.
- Take care that the solution is economically viable and materials are locally available.

OR

PART 2

- Suggest innovative way of reuse or recycling of any one of the packing or packaging material.
- Write report.

Please note:

- There are TWO parts of the project. Both have to be done.
- Part 1 of the project is common for all projects. It needs to be done at home.
- You can choose ANY 1 option from the options given as Part 2.
- Remember the main theme of the project is packing and packaging. Your work MUST be related to packing or packaging.
- We need to find solution to the issue. We are NOT focussing on effects of this material on environment under the theme suggested.
- Considering pandemic, avoid survey. If necessary, you can use 'Google Forms' to conduct the survey. You can conduct interviews if required, telephonically.

Ref.: www.google.com