

# The FMCG Packaging: Moving the Market towards Sustainable Packaging Materials

Ankit Patel<sup>1</sup>, Dr. S N Teli<sup>2</sup>, Yogesh Dhumal<sup>3</sup>

<sup>1</sup>PG Student, Dept. of Mechanical Engineering, SCOE Kharghar, ankit520@live.com

<sup>2</sup>Professor, Dept. of Mechanical Engineering, BVCOE Kharghar, shivanandteli@yahoo.com

<sup>3</sup>PG Student, Dept. of Mechanical Engineering, SCOE Kharghar, yogiking10@gmail.com

**Abstract:** Sustainable packaging in the FMCG (fast moving consumer goods) market is moving from being purely cost driven towards a strategic approach of resource management.

The principal purpose of packaging continues to be maintaining the safety, wholesomeness, and quality. The large growing middle class, liberalization and organized retail sector are the catalysts to growth in packaging. The key packaging materials are glass, metal, plastics, paper, laminates, co-extrusion and bio-degradable polymers.

Being a cost-sensitive market, the pressure for FMCG companies to reduce packaging costs in India is strong. In the past 5-6 years the market for sustainable packaging in India was driven primarily by cost reduction, however, moving forward corporations are now placing more thought leadership into their sustainable packaging plans across the value chain.

Indeed, packaging plays an essential role for FMCG businesses in meeting consumer needs and preventing waste by protecting products for proper consumption. The fast selling and low margin products have a high production and consumption rate, as well as, an extensive distribution network that demands large amount of paper/plastic/glass and metal. Sustainable packaging ultimately is the practice of ensuring any material waste from packaged products never leaves the value chain, as well as, uses material with little to zero environmental harm.

**Key words:** FMCG, Packaging Value Chain, Sustainability, Waste-Stream.

## INTRODUCTION

Packaging is the science, art and technology of enclosing or protecting products for distribution, storage, sale, and use. Packaging has its own importance in business as it allows the products to be transferred from the manufacturing plants to the customers and consumers. Historically, package design was a task centered on specifying, and often pre-conceived package, with the primary goal of achieving compatibility with the filling and sealing operations. Thus, the packaging has been used to:

- Protect the product/ finished good
- Distribution of product
- Store the product
- Carry information
- Present the products to consumers

In current era, the traditional packaging value chain, where there was little linkage between functions like purchasing, operations, logistics, product development, sales & marketing is over. Despite of this in the current model, every member is participating, connecting value and innovation with retailers and consumers feedbacks. Moreover, the Packaging is

involved in the product development process itself and revolves around Consumers' ergonomics, attention grabbing displays, brand equity, appearance and point of purchase. Now packaging very much associates with a firm's brand equity and it is considered as an asset to the business with value and not just the cost.

In short, today packaging is no longer simply a container to wrap your product, a cost to bear, a line item to constantly trim and save against. Today it builds loyalty, it creates preferences, it positions you in the market, it influences whether your consumers like you, it helps frame your personality, identity and image, it builds familiarity, it helps communicate "why me?", it helps drive awareness, it helps to differentiate.

## INDUSTRY AT A GLANCE

The Indian Packaging Industry is valued in between US\$ 24 to 25 billion in the year 2011. The large growing middle class, liberalization and organized retail sector are the catalysts to growth in packaging. More than 80 percent of the total packaging in India constitutes rigid packaging, & remaining 20 percent comprises flexible packaging. There are about 600-700 packaging machinery manufacturers, 95% of them are in the small and medium sector located all over India. The major segments of packaging industry are: flexible packaging, folding cartons, corrugated boards and boxes, labels, shrink sleeves and wrappings and glass bottles. Earlier rigid packaging dominates, however currently there is a shift in demand and flexible packaging demand is increasing. The properties of rigid and flexible packaging have been compared in Table 1.

Table 1. Properties of Rigid and Flexible packaging

Description	Rigid	Flexible
Weight	Heavy	Light
Size	Used for bigger packs	Good for small packs
Storage	Bigger space required	60% less space required
Energy required	More energy required	40% less energy required
Re-sealing	Not possible	Possible
Re-use	Possible	Not Possible
Disposal	Difficult	Easy

### Sustainability Interventions in the Packaging Value Chain

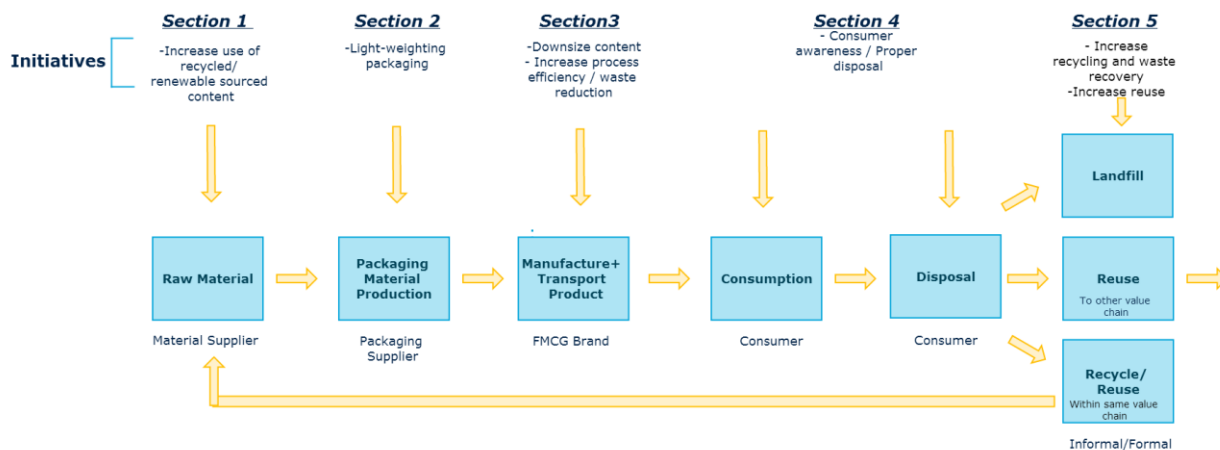


Fig.1 Sustainability Interventions in the Packaging Value chain

### THE PACKAGING VALUE CHAIN

The ideal system of sustainable packaging would be a complete closed-loop system where zero material is wasted and instead all is recycled or reused post consumption. Any FMCG corporation trying to create sustainable packaging for their products should adopt a holistic approach covering all the aspects of the packaging value chain from raw material to post consumption disposal and treatment.

**Type of Raw Material (Section 1):** First step in the sustainable packaging value chain is choosing the right raw material for product packaging. A FMCG manufacturer needs to decide on the type of packaging material used, not only on its ability to be recycled/reused into the same product or up-scaled into a better product but more importantly on its ability to protect the product it contains. Although a difficult type of initiative to implement, it is critical due its significant impact on achieving a closed looped packaging chain (zero waste).

Example – ITC implemented 99.8% waste paper in their corrugated packaging boxes for their Sunfeast brand. It helped to lessen the burden of extracting raw fiber material.

**Material Use (Section 2):** The next step requires a product manufacturer to partner with its packaging supplier to determine the optimum amount of packaging material to use and find the right balance between under-packaging and over-packaging. Optimal packaging supports more efficient logistics and distribution down the value chain.

Example – SC Johnson reduced the material use in their Mr Muscle cleaner bottle by 9%, which saves them 9,00,000 pounds of plastic resin on bottle annually.

**Re-design Product and Optimize Product Distribution (Section 3):** The third step requires them to re-design their product such that it requires less packaging. This step also includes optimizing the packaging (required for transport) throughout the distribution channel – from the manufacturer to the retailer.

Example – Unilever re-designed their products to sell concentrated form of cleaning liquid. Thus, packaging was reduced considerably.

**Consumer Awareness (Section 4):** Educating the consumer about the benefits and methods of waste management will spur behavioral change and subsequently lower the burden on the packaging value chain for collection and segregation of recyclable material.

Example – Consumers were offered discounts against further purchases in exchange for returning used/empty plastic bottles and pouches to Bharti Stores across Delhi. This helped in increasing consumer awareness and leads to responsible disposal of packaging waste.

**Post consumption Treatment (Section 5):** The last step requires all stakeholders to ensure the packaging never leaves the packaging value chain or enters an equivalent/better value chain. Considering the existing poor state of waste management systems at local municipality levels in India, it is imperative to implement initiatives related to treatment of packaging waste to achieve a sustainable packaging value chain.

Example – Dabur Foods works with packaging suppliers and engages the informal sector to pick-up Tetra Pak packaging waste form the streets and city dumps to up-cycle them into product. This helped to increase rate of waste packaging re-entering in the value chain.

### COMMON PACKAGING MATERIALS IN USE

**Glass:** Glass has an extremely long history in FMCG packaging; the 1st glass objects for holding food are believed to have come out in around 3000 BC. The process of glass formation involves heating a mixture of silica, sodium carbonate, calcium carbonate and alumina (stabilizers) to very high temperatures until the mixture melt into a thick liquid mass which is poured into the molds. Broken glass pieces are also recycled and are used in glass manufacturing as one of the raw material. Glass containers used in foodstuff packaging is generally surface-coated hence provides lubrication in the production line and removes surface scratching or abrasion. Glass coatings improves the strength and finally reduces breakage. Improved break resistance allows manufacturers to use thinner glass, which reduces

weight and is better for transportation and disposal. Because it is inert with almost all foodstuffs, so glass has several advantages to food-packaging applications. The primary driver of glass packaging in India remains the soft drinks and alcoholic beverages industry. Pharmaceutical applications of glass continue to reduce as the traditional glass packaged products continue to shift to rigid plastics. However, continued growth in demand is expected from alcoholic drink manufacturers, who prefer glass packaging, due to the premium image of glass packaging.

**Metal:** Metal is the most versatile of all packaging forms. It offers a combination of excellent physical protection and barrier properties, formability and decorative potential, recyclability, and consumer acceptance. The two metals most predominantly used in packaging are aluminum and steel. Aluminum is commonly used to make cans, foil, and laminated paper or plastic packaging. Food cans, trays, bottle caps, and closures can all be made from different metal alloys. In addition, it can also be used to make large containers (such as drums) for bulk sale and bulk storage of ingredients or finished goods. Metal packaging is still among the fastest growing packaging categories in India driven largely by categories like aerosol packaging (deodorants, air fresheners, insect repellents etc.) and beverage cans (beer, soft drinks and health drinks).

**Plastics:** Multiple types of plastics are being used as materials for packaging food, including polyolefin, polyester, polyvinyl chloride, polyvinylidene chloride, polystyrene, polyamide, and ethylene vinyl alcohol. Although more than 30 types of plastics have been used as packaging materials, polyolefins and polyesters are the most common. Polyethylene terephthalate (PET or PETE), polycarbonate, and polyethylene naphtholate (PEN) are polyesters, which are condensation polymers formed from ester monomers that result from the reaction between carboxylic acid and alcohol. The most commonly used polyester in food packaging is PET, particularly beverages and mineral waters. The use of PETE to make plastic bottles for carbonated drinks is increasing steadily.

**Laminates and co-extrusion:** Plastic materials can be manufactured either as a single film or as a combination of more than one plastic. There are different ways of combining plastics like lamination and co-extrusion. The co-extrusion coating, applied on different materials, permit the traditional exigencies of “polyethylene coating” properties as barrier, peel-able sealing or other. Lamination involves bonding of two or more plastics to another material such as aluminum or paper and this bonding is commonly attained by use of adhesives. After the adhesives are applied to first film, both films are passed between high pressure rollers. Lamination using laser rather than adhesives has also been used for thermoplastics (Kirwan, 2003). In co-extrusion, two or more layers of molten plastics are combined during the film manufacture. The co-extrusion coating, applied on different materials, permit to add to the traditional exigencies of “polyethylene coating” properties as barrier, peel-able sealing or other. Overall demand for packaging laminates was driven by the continued usage in existing categories and adoption

into a wide range of new products like Ready to eat, hot drinks, and home care products.

**Paper:** Paper is made from cellulose, trees being the main source of cellulose fiber (or wood pulp). Besides wood pulp, paper can be made from other materials such as cotton, flax, esparto, straw, hemp, manila and jute. Some of the pulp properties depend upon the process used to separate the fibers from the timber. The fibers are pulped and/or bleached and treated with chemicals such as silicide’s and strengthening agents to produce the paper product. Paper and paperboards are commonly used in corrugated boxes, milk cartons, folding cartons, bags and sacks, cups, wrapping paper, tissue paper and paper plates.

**Paper laminates:** Paper laminates are coated or uncoated papers based on craft and sulfite pulp. They can be laminated with aluminum or plastic or other material having the same functional properties to improve various properties. The paper can be laminated with polyethylene to make it heat sealable and to improve WVTR. However, lamination considerably increases the cost of paper. Laminated paper is used to package dehydrated products such as ready to serve soups, spices and grounded herbs.

**Biodegradable polymers:** These are originated from replenish-able stocks from animal sources, marine food processing industry wastes, or microbial sources. In addition to renewable raw ingredients, biodegradable materials break down to produce environmentally friendly products such as carbon dioxide, water, and quality compost. Even if biodegradable packaging is not practical on a broad basis, the advantages are very significant for certain applications. The litter argument for biodegradable plastics has advantage to the extent that biodegradable plastics will tend to break down and become less obtrusive after being littered. Further Green Polyethylene is a plastic produced from ethanol sugarcane, a renewable raw material, while the traditional polyethylene uses fossil source draw materials such as oil or natural gas. For this reason, its production is also helping to reduce greenhouse gases emission. The products are currently available in the market as high density polyethylene (HDPE) and linear low-density polyethylene (LLDPE) covering rigid packaging applications, flexible, caps & closures and bags.

The share of packaging mediums is shown in Fig.2.

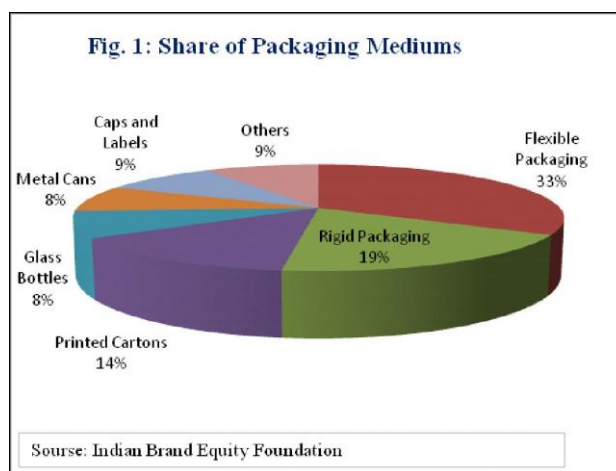


Fig.2 Share of packaging mediums

## THE PATH TO SUSTAINABLE PACKAGING

Sustainable packaging is a relatively new addition to the environmental considerations for packaging in India. It is beneficial, safe & healthy for individuals and communities throughout its life cycle and should meet market criteria for performance and cost while it is sourced, manufactured, transported, and recycled using renewable energy. It is made from materials healthy throughout the life cycle and is physically designed to optimize materials and energy. It also includes Remove, Reduce, Recycle, Renew, Re-use.

Businesses in India view sustainable packaging as an important initiative in their overall sustainability goals. Out of the top 42 FMCG businesses operating in India, 23 have sustainability reports, all of which regard sustainable packaging as a key issue in their supply chain. Out of those 23, 15 have implemented one or more sustainable packaging initiatives within their supply chain in India, while 8 either have future plans or solely mention its importance. As per research based on publicly disclosed information by FMCG firms in India, 36% of all packaging initiatives undertaken in India are linked to light weighting the packaging material or downsizing the packaging content. This trend is prevalent across the globe. 19% FMCG manufacturers in India also focus on waste recovery initiatives. However, only 15% of all Indian initiatives included the use of recycled/renewable content, far behind their global counterparts which accounted for 31%. Thus, there is a clear distinction where Indian corporates are lacking comparable to the rest of the global, as well as, an opportunity for possible growth.

### Light Weighting Innovations

When a company aims to correct inefficiency in their packaging it becomes a win-win scenario for both the value chain and the bottom-line, less waste added and less material purchased. For example, Pepsi Co saw a 5% reduction in costs with their light-weighting initiatives globally. The majority of sustainability packaging linked initiatives undertaken by corporations both globally and within India was to lightweight or reduce packaging material. Such initiatives are low hanging fruits, since there is a foreseeable rate of return on light weighting investments thus making FMCG companies more amenable to undertake the related investment.

It can also be observed, when inflation rose over the past five to six years, large FMCG companies in India (Britannia, Parle, ITC, Pepsi Co, Mondelez, Coca Cola, etc.) combated back by reducing their packaging weight. The practice of light weighting material instead of rising prices to combat inflation among the FMCG sector is well known. Luckily such costs saving actions align with the practice of sustainable packaging.

Packaging generally makes up 7-11% of total costs of a product for most FMCG companies. Additionally, in 2011 packaging prices increased up to 3-5% in India. In order to combat these, companies either increased their prices or reduce their packaging, with similar effects. As inflation rates continue to rise, large FMCG corporations are strategizing to reduce the weight of their packaging by substantial amounts. Out of the 23 corporations with sustainability report, 100% mention targets to reduce packaging volume/weight in the future.

The driver for the largest share of sustainable packaging initiatives in India was FMCG companies combating rising inflation without having to raise costs.

### Catalyzing Re-entry of Packaging Waste into the Value Chain

A corporation can light weight all their products, change to 100% recyclable material, have the most efficient process but if the post-consumer packaging doesn't end up back into the value chain then it serves little purpose.

India's entire recycling system stems from how much an informal sector worker can fetch for a certain material. If the material can't attract enough price then it doesn't re-enter the value chain. A low price doesn't reflect the lack of economic value embodied in the waste, but rather, there are no formalized waste channels to which informal workers can sell to. For example, only 27% of total paper and paperboard consumed in India is reintroduced into the system. Meanwhile, 60% of total waste paper used is imported from overseas, which suggests that these waste products have an economic value which can be realized if one can develop 'at bulk, reliable' waste streams in India. On a similar vein, plastics like polystyrene (PS), polyethylene (PE), and polypropylene (PP) have low recycling rates due to their low monetary value for wholesale recyclers but are extremely valuable inputs for emerging plastics to fuel industries.

### Creating a Reliable Waste-Stream in the informal sector

Polyethylene (PE) and polypropylene (PP) make up 90% of all polymers used in flexible packaging and additionally makes up the majority of all packaging mediums (33% is flexible packaging). HDPE and certain PET make up rigid plastic packaging. PE and PP compass a large amount of packaging waste but currently there is no effective way to enter it back into the value chain due to a lack of monetary incentive for the informal sector.

Large FMCG companies in India are creating market value for PE, PP, and Tetra Pak packaging in order for the informal sector to collect them off the streets. Still in its early stages, Unilever is trying to create a program to deliver market value for light plastic packaging and discarded sachets to incentivize the informal sector.

As another example, Dabur has partnered with TetraPak to educate the informal sector about recycling TetraPak material in order to decrease the amount headed towards a landfill. Once recycled TetraPak can be re-used to create a variety of products like office stationary and roofing sheets. By collaborating directly with the informal sector, Dabur made an arrangement for door-to-door collection of waste, as well as, a sorting and segregation facility. As well, there is significant work happening among the plastic to waste industry to collect and re-purpose this low value plastic but currently it's only being catalyzed by the CSR budgets of FMCG. Overall, more collaboration between stakeholders is needed in order to decrease the 6,137 tonnes a day of plastic flooding the streets of India. As well, in order to hit sustainability targets, stakeholders have to incentivize the collection of low value waste by the informal sector.

**Collaboration: The Way Forward**

It requires a deep level of collaboration across all sectors in order to truly reach a sustainable packaging value chain. Currently the market for sustainable packaging is being driven individually by FMCG companies within their own production network. It is difficult to achieve sustainability projects without working closely with many retailers and manufacturers; it is even tougher to do so in the FMCG market with numerous players and low margins.

Table 2. Actions Stakeholders can engage in to promote a holistic packaging value chain

Stakeholder	Opportunity
FMCG Companies	<ul style="list-style-type: none"> <li>• Implement more renewable/ recycled material in their product.</li> <li>• Implement recycling and reusing initiatives in order to raise the rates of recycling for their products.</li> </ul>
Consumers	<ul style="list-style-type: none"> <li>• Follow proper waste disposal practices.</li> <li>• Demand that their product encompass a holistic value chain</li> </ul>
Policy makers	<ul style="list-style-type: none"> <li>• Propose legislation to propel bio-plastics to a larger scale.</li> <li>• Promote the informal sector to collect low value waste material.</li> </ul>
Local Municipalities	<ul style="list-style-type: none"> <li>• Develop controlled waste streams they own in order to ensure all waste is collected and not just with high market value.</li> </ul>
Investors	<ul style="list-style-type: none"> <li>• Direct investment to expand bio-plastic market, formal waste management.</li> </ul>
Packaging supplier	<ul style="list-style-type: none"> <li>• Demonstrate commitment to sustainable packaging in order to increase company value to large FMCG corporations.</li> </ul>

It is easier for suppliers to help meet sustainability goals if FMCG companies are all working on the same things and if all FMCG companies are asking for the same information. Although, in the FMCG market branding of products is constantly changing to match consumer preference and it becomes difficult to coordinate long-term. Nevertheless, there are bright stars in the FMCG market in terms of collaboration. For example, Coca Cola has licensed their Plant Bottle technology to Heinz, Procter and Gamble and Ford for use in their products in order to expand the penetration of their bio-plastic in the market.

**CONCLUSION**

Under invariable pressure from government, customers, consumers and media, the packaging industry is progressively being forced to think more about how the packaging of their products can be made more sustainable. The concept of sustainability not only combines the environmental but also includes social, ethical, and legal issues that can be both internal and external to the company. The common sustainable packaging trends are like downsizing the weight of packing material, improved recycling and recovery of waste, and increasing the use of recycled content. The consumers want sustainability but most of the consumers do not want to pay more for Green Packaging/Sustainability.

As India’s demand for more packaged goods rises over the coming years, all stakeholders have to work together in order for the recycling rate to out match the production rate of packaging material. Large FMCG brands have the greatest power to direct sustainable initiatives but need to understand the holistic nature of packaging in order to truly achieve the goals of sustainable packaging. Overall, it is the collective responsibility of government, policy makers, FMCG corporations, suppliers and consumers to reduce the amount of packaging waste headed to landfills and achieve a zero-waste approach to packaging.

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