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Management

CIRCULAR APPROACH TO DESIGN RETHINKING: SPECIAL REFERENCE TO CARDBOARD

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ABSTRACT This study was undertaken to assess the use of cardboard post shopping in selected areas of Delhi. The study was focused on concerns related to circular approach among the stakeholders i.e., minimize, reuse, recycle and upcycle the packaging waste. To get a comprehensive view of the workers' condition, stakeholders were selected from different managerial levels. The study was an attempt to explore the policies adopted and followed by the stakeholders (Manufacturers, Retailers, Consumers, and Municipal officials) to make cardboard reusable, recyclable and up-cyclable thereby preventing material wastage and protecting the environment. The study has thrown light on the initiatives taken by the various startups or companies related to minimizing packaging waste. The findings and suggestions that had emerged from the study can be used by policymakers and by the manufacturers, retailers, and customers as it identifies the loopholes in the existing system. Filling in these voids can create a pathway towards a more sustainable and pollution free environment.

KEYWORDS : Circular approach, circular economy, sustainability, solid waste management, packaging waste management, cardboard packaging, 7 R's, eco-friendly

INTRODUCTION

The world economy is only 9.1% circular, leaving a massive 'Circularity Gap'. Bridging the circularity gap requires intervention across the full breadth of society and action in nations, sectors, supply chains, and cities. It involves a process in order to make the cycle eco-friendly, to help and sustain the environment (The circular economy gap report, 2018).

Issues and concerns towards packaging design

The Packaging and containers create a significant portion of municipal solid waste (MSW), which amounts to 82.2 million plenty of generation in 2018 (28.1 percent of total generation) consistent with the information collected by EPA. The packaging is employed to guard goods, 8 including food, beverages, medications, and cosmetic products. Packaging and containers are employed in the shipping, storage, and protection of products. Containers and packaging forms a significant portion of Municipal Solid Waste (MSW), amounting around 80.1 million heaps of generation in 2017 (29.9 percent of total generation). The packaging is that the product won't wrap or protect goods, including food, beverages, medications, and cosmetic products. Containers and packaging are utilized in the shipping, storage, and protection of products (EPA, 2017).

During secondary research for the study, it was found that cardboard as a packaging material was used extensively for packaging particularly for the protection of contents because of poor planning and communication, after single-use, they're discarded much earlier in their life and hence, they are the main focus of the study.

Hazards of Packaging Waste

Packaging materials from a long time are considered as a single use item which means after using the merchandise from the package, consumers should dispose-off the packaging as garbage much before its usable lifespan. This mindset prevails amongst most consumers thereby resulting in big piles of packaging ending up in the municipal bin. The waste generated has a direct impact on the environment. The packaging waste is directly dumped into the landfills which are increasing the volume of the landfills and are affecting the environment. Also, the production of cardboard consumes wood pulp obtained by cutting trees.

E-commerce packaging and the disposal of waste have immense environmental costs. Nowadays, packaging comes in multiple layers. These packaging materials are recyclable, India's abysmal record indicates that a large portion of these materials will end up clogging the drains and landfills (Reddy, 2018).

Table 1: Policies of government towards SWM (2016): Focus on Discarded Packaging

S.No.	For Manufactures	For Retailers	For Consumers
1.	Extended Producer Responsibility	Minimize excessive packaging	Minimize purchasing excessive packaged products
2.	Collection of used multi-layered plastic sachet or pouches or packaging is the responsibility of producers, importers and brand owners	Encourage consumers to reuse shopping bags.	Reuse cardboard/bubble wrap packaging
3.	Phase out manufacture and use of multi layered plastic within two years	Request suppliers to reduce bulky packaging	Place recycling bins inside the house to dispose packagingwaste for recycling
4.	Apply for registration as producer within three years of publication of gazette of SWM rules.	Place drop boxes for collection (inside or outside the store), so that customers and employees can dispose packaging waste for recycling	Use and purchase products that are packaged using recycled materials
5.	Stop manufacture for use of plastic or multi-layered packaging without registration from the concerned State Pollution Control Board or the Pollution Control Committees after 6 months of publication of Gazette.	Sell, purchase and promote products that are packaged using recycled materials	Linked with organizations working for recycling packaging waste and provide them your collected packaging waste
6.	Every producer shall maintain a record of details of the person engaged in supply of plastic used as raw material (carry bags or plastic sheet or multi-layered packaging)	Promote by participation in buy-back programs or upcycling programs	

Source: Ministry of Environment, Forest and Climate Change. (2016). Uniform Framework for Extended Producers Responsibility.

Retrieved from:http://moef.gov.in/wpcontent/uploads/2020/06/Final-Uniform-Framework-on-EPR-June2020-forcomments.pdf

Table 2: Adoption of policies by manufacturers, retailers, and customers

S.No.	Manufacturers and retailers	Consumers
1.	Invest in a machine which crushes the cardboard for the stockroom to easily bale used cardboard or other recyclables as merchandise comes in	Educate the family members on what they can do to reduce, reuse, and recycle, not only while they are at home, but also at work and on-the-go

2.	Educate the staff on what they can do to reduce, reuse, and recycle, not only while they are at work, but also at home and on-the-go	Connections with industry/waste handlers for recycling
3.	Network with industry/waste handlers for recycling	Ensure that packages could be reused innovatively at the house till it lasts
4.	Ensure that packages could be reused innovatively at the store till it lasts	Contacts with NGOs/ individuals who reuse/recycle/up-cycle

Source: Ministry of Environment, Forest and Climate Change. (2016). Uniform Framework for Extended Producers Responsibility.

The study aims to address the larger goal of waste management for sustainable development. It relies on getting a concept of the current scenario of management of waste packaging materials at different levels. Policies and strategies adopted by different stakeholders to minimize the packaging and subsequent examples of startups and companies, to provide the solutions to address the existing problem subsequent to circular approach.

AIM AND OBJECTIVES:

- To study the practices of stakeholders with regard to cardboard and plastic bubble wrap packaging post usage of its contents, with respect to Government regulations.
- To investigate initiatives of stakeholders towards selected packaging design to be fully reusable, recyclable or compostable.
- To find out the initiatives taken by companies and startups to bring circular approach towards designed rethinking

RESEARCH METHODOLOGY

Selection of the packaging material, vis-à-vis', cardboard packaging since it's share in packaging is significantly high. Cardboard contributed the most and thus formed the focus of present study. Manufacturers, Retailers and Municipal officials and Consumers were selected who were manufacturing and consuming cardboard as packaging material. Purposive sampling method was used to select the stakeholders for the study. The total sample comprises of 56 stakeholders from 2 selected localities of South Delhi (Lajpat Nagar and Nehru Nagar)– Manufacturers (4), Retailers (10), Municipal officials (2) and Consumers (40, 20 from each locality). The data collected was analyzed both quantitatively and qualitatively as per the objectives of the study.

RESULT AND DISCUSSION

The findings of the study revealed that most of the manufacturers (75%) were youngsters who had the knowledge about the 7 R's of sustainability and the problems encountered on account of accumulation of large amounts of packaging waste. Further, it was found that the policies of the government were least followed by the manufacturers, and retailers. Though they had not adopted neither the policies of the government nor had devised their own strategies to reduce the packaging waste being generated in the manufacturing unit.

Table 3: Types of Packaging manufactured (n= 4)

1. Cardboard (n=2)			
S.No.	Cardboard Packaging	Manufacturer 1 (m1)	Manufacturer 2 (m2)
	Classification by Layer		
1.	Single layer	✓	✓
2.	Double Layered	✓	✓
3.	Multi-layered	✓	✓
	Classification by Material		
1.	Paperboard: Mono-cartons	✓	
2.	Mat Board	✓	
3.	Corrugated Fiber Board	✓	✓
4.	Rigid Boxes	✓	

As far as the retailers were concerned, they were also not following the policies of the government, but they focused on minimizing the packaging waste. Both the retailers and manufacturers stated that they don't recycle the used packaging waste. Only selected retailers reuse the packaging waste at their retail store for storing the products.

Table 4: Practices with Respect to Regulations for Managing Selected Packaging Waste (n= 4)

S.No.	Practices with respect to compliance with Government policies for SWM 2016	Awareness		Execution Level	
		Aware	Not Aware	Mandatory	Optional
1.	Extended Producer Responsibility	2 (50%)	2 (50%)	4 (100%)	-
2.	Collection of used multi-layered plastic sachet or pouches or packaging is the responsibility of producers, importers, and brand owners	2 (50%)	2 (50%)	3 (75%)	1 (25%)
3.	Phase out manufacture and use of multi-layered plastic within two years	1 (25%)	3 (75%)	2 (50%)	2 (50%)
4.	Apply for registration as producer within three years of publication of gazette of SWM rules.	2 (50%)	2 (50%)	4 (100%)	-
5.	Stop manufacture or use of plastic or multilayered packaging without registration from the concerned State Pollution Control Board or the Pollution Control Committees after 6 months of publication of Gazette.	2 (50%)	2 (50%)	2 (50%)	2 (50%)
6.	Every producer shall maintain a record of details of the person engaged in supply of plastic used as raw material (carry bags or plastic sheet or multilayered packaging)	2 (50%)	2 (50%)	4 (100%)	-

*Figures in ( ), denotes the percentage of manufacturers

Table 5: Policies adopted by retailers for managing cardboard and plastic bubble wrap post usage of packaging. (n= 10)

S.No.	Practices	Practices Adopted			Execution Level	
		Adopted	Not Adopted	Don't Know	Mandatory	Optional
1.	Minimize excessive packaging	5 (50%)	1 (10%)	4 (40%)	7 (70%)	3 (30%)
2.	Encourage consumers to reuse shopping bags.	6 (60%)	3 (30%)	1 (10%)	10 (100%)	-
3.	Request suppliers to reduce bulky packaging	2 (20%)	4 (40%)	4 (40%)	5 (50%)	5 (50%)
4.	Place drop boxes for collection (inside or outside the store), so that customers and employees can dispose packaging waste for recycling	3 (30%)	1 (10%)	6 (60%)	4 (40%)	6 (60%)
5.	Sell, purchase, and promote products that are packaged using recycled materials	1 (10%)	1 (10%)	8 (80%)	4 (40%)	6 (60%)
6.	Promote by participation in buy-back programs or upcycling programs	-	2 (20%)	8 (80%)	3 (30%)	7 (70%)

*Figures in ( ), denotes the percentage of retailers

Table 6: Strategies Adopted by Retailers to Manage Cardboard and Plastic Bubble Wrap Packaging Waste (n= 10)

S.No.	Strategies to manage the cardboard and plastic bubble wrap packaging waste	Strategies Adopted		Execution Level (Often /occasionally /never)		
		Adopted	Not Adopted	Often	Occasionally	Never
1.	Invested in a machine which crushes the cardboard for the stockroom to easily bale used cardboard or other recyclables as merchandise comes in	-	10 (100%)	-	-	10 (100%)
2.	Educate the staff on what they can do to reduce, reuse, and recycle, not only while they are at work, but also at home and on-the-go.	1 (10%)	9 (90%)	1 (10%)	-	9 (90%)
3.	Network with industry/waste handlers for recycling	-	10 (100%)	-	-	10 (100%)
4.	Ensure that packages could be reused innovatively at the store till it lasts	3 (30%)	7 (70%)	-	4 (40%)	6 (60%)
5.	Network with NGOs/ individuals who reuse/recycle/up-cycle	-	10 (100%)	-	-	10 (100%)

*Figures in ( ), denotes the percentage of retailers

Findings divulge that all the customers were aware about the basic principles behind the use of 3 R's, i.e., Reuse, Reduce and Recycle of waste, and also, they had the knowledge about the 7 R's of sustainability, i.e., Rethink, Refuse, Reduce, Reuse, Repurpose, 58 Recycle and ROT. From the responses of the customers, it could be concluded that a lot of innovation is needed to be done in the packaging designs, to minimize the packaging waste and to help the environment.

Figure 1: Shopping Mode used/Preferred

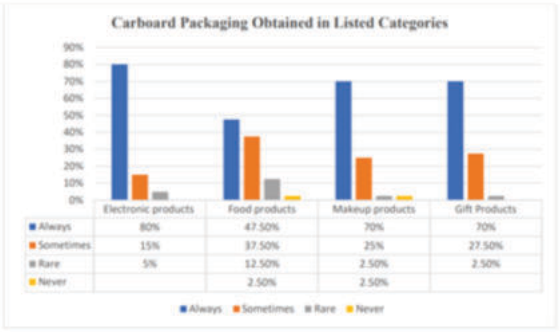

Figure 2: Carboard Packaging Obtained in Listed Categories

Table 7: Policies adopted by customers for managing used cardboard and plastic bubble wrap waste. (n= 40)

S.No.	Practices	Practices Adopted			Execution Level (as per SWM rules 2016)	
		Adopted	Not Adopted	Don't Know	Mandatory	Optional
1.	Minimize purchasing excessive packaged products	17 (42.5%)	15 (37.5%)	8 (20%)	23 (57.5%)	17 (42.5%)
2.	Reuse cardboard/bubble wrap packaging	30 (75%)	6 (15%)	4 (10%)	24 (60%)	16 (40%)
3.	Place recycling bins inside the house to dispose packaging waste for recycling	24 (60%)	11 (27.5%)	5 (12.5%)	28 (70%)	12 (30%)
4.	Use and purchase products that are packaged using recycled materials	14 (35%)	16 (40%)	10 (25%)	12 (30%)	28 (70%)
5.	Linked with organizations working for recycling packaging waste and provide them your collected packaging waste	23 (57.5%)	17 (42.5%)	-	26 (65%)	14 (35%)

*Figures in ( ), denotes the percentage of customers

Table 8: Strategies Adopted by Customers to Manage the Cardboard and Plastic Bubble Wrap Packaging Waste. (n= 40)

S.No.	Strategies	Strategies Adopted		Execution Level		
		Adopted	Not Adopted	Always	Occasionally	Never
1.	Educate the family members on what they can do to reduce, reuse, and recycle, not only while they are at home, but also at work and on-the-go	34 (85%)	6 (15%)	35 (87.5%)	4 (10%)	1 (2.5%)
2.	Connections with industry/waste handlers for recycling	19 (47.5%)	21 (52.5%)	25 (62.5%)	8 (20%)	7 (17.5%)
3.	Ensure that packages could be reused innovatively at the house till it lasts	34 (85%)	6 (15%)	33 (82.5%)	6 (15%)	1 (2.5%)
4.	Contacts with NGOs/ individuals who reuse/recycle/up-cycle	17 (42.5%)	23 (57.5%)	21 (52.5%)	14 (35%)	5 (12.5%)

*Figures in ( ), denotes the percentage of customers

Table 9: Suggestions as per level of acceptance (n= 40)

S.No.	Suggestions	Agree	Disagree	Don't Know
1.	Measures should be taken to decompose used cardboard and plastic bubble wrap at your house.	35 (87.5%)	2 (5%)	3 (7.5%)
2.	You should be aware about the changes in the packaging of the products	35 (87.5%)	4 (10%)	1 (2.5%)
3.	You should give preference to the packaging of the products while purchasing	31 (77.5%)	4 (10%)	5 (12.5%)
4.	Being a responsible consumer, you should be aware about the organizations working for reuse, recycling, and upcycling of packaging waste	36 (90%)	3 (7.5%)	1 (2.5%)

***Figures in ( ), denotes the percentage of customers**

The study showed that they should focus on minimizing the packaging waste and should take appropriate actions to help in reducing the waste and stop it from going to the landfills.

Best practices by industries, individuals, and communities:

As people are now getting turned into sustainable products and are demanding environmentally friendly products. Also, there's a rise in demand for the packaging and materials generated from waste. There are many companies that are acting on providing sustainable packaging to their customers, to extend their life. The best practices include:

1. 'Karo Sambhav' is an entity which has been developed by PACE (Packaging Association for Clean Environment), it includes 30 companies including PepsiCo, Coca-Cola, CavinKare, Diageo, and its members. It'd work towards recycling the packaging waste, collect post consumer packaging, and work towards network recovery facilities.
2. Packmile, a B2B sustainable packaging enterprise, is functioning with Amazon to supply products in wrapping paper, which is biodegradable and recyclable.
3. Walmart, which is the largest retailer within the world, is phasing out single-use plastic bags and it is incorporating recycling labels that inform consumers on where to dispose of the materials. According to them by 2025, recyclable, reusable, or compostable packaging status.
4. Kellogg's by 2025, planning to switch the packaging completely reusable, recyclable, or compostable.
5. Unilever is additionally taking proactive actions to induce plastic packaging reused, recycled, or composted. It's investing a lot in circular economy initiatives for the identical.
6. Samsung electronics has introduced its new 'eco-packaging' which is a new type of product packaging that would facilitate the upcycling of boxes.
7. Amazon has decided to eliminate single-use plastic in packaging. It has also taken an initiative to deliver the products in original packing of the products.
8. Big Basket has also taken an initiative to eliminate single-use plastic packaging. There are many NGOs who are working for the same, and also now a day's people are buying things more consciously

CONCLUSION

As per the study, it is really important to promote a circular approach in the area of packaging, to increase the lifespan of the materials and minimize the waste generated. All the online packages received are still coming in cardboard packaging which are discarded by the consumers and not being taken by the stakeholders. The study concluded that the companies should focus on bringing circularity in the usage of packaging and a proper channel should be developed to facilitate the process. Proper trainings and workshops should be conducted in the manufacturing industries related to the reusage, upcycling and recycling of the used packaging.

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